# Appendix I1: Traffic Report

**The appendices to this document are available electronically.**

# Appendices

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LINSCOTT LAW & GREENSPAN engineers

**REVISED TRAFFIC CIRCULATION ANALYSIS**

# BREA MALL MIXED-USE PROJECT

**Brea, California**
**July 1, 2022**

*Prepared for:*

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LLG Ref. 2-19-4099-1




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**REVISED TRAFFIC CIRCULATION ANALYSIS**

# BREA MALL MIXED USE PROJECT

**Brea, California**
**July 1, 2022**

## 1.0 INTRODUCTION

This Traffic Circulation Analysis report addresses the potential traffic and circulation needs associated with Brea Mall Mixed Use Project (hereinafter referred to as Project) in the City of Brea. The Project consists of redevelopment of 15.0-acre in the southwest portion of the Brea Mall property that includes the Sears parcel and adjoining transition areas adjacent to Nordstrom and Macy's. The Project involves demolishing 161,990 square-foot (SF) of the Sears department store and associated auto center and roughly 7.5 acres of surface parking in order to development 247,415 SF of new retail space, inclusive of a 50,000 SF sporting goods store and a 128,000 SF health club. The residential component would construct a 383-unit seven-story apartment building. The proposed Project is located west of the State Route (SR) 57 Freeway and is generally bounded by State College Boulevard to the east, Imperial Highway (State Route 91) to the south, Randolph Avenue to the west, and Birch Street to the north. The Project is expected to be developed in several phases with the Year 2026 utilized to assess the Project's potential traffic implications at full occupancy within a near-term cumulative traffic setting with the addition of project-generate traffic.

### 1.1 Scope of Work

This traffic circulation report documents the findings and recommendations of a traffic analysis conducted by Linscott, Law & Greenspan, Engineers (LLG) to determine the potential implications associated with the addition of traffic generated by proposed Project. The traffic analysis evaluates the existing operating conditions at eighteen (18) key study intersections within the project vicinity, estimates the trip generation potential of the proposed Project, and forecasts future near-term (Year 2026) and long-term (Year 2045) operating conditions without and with the proposed Project. Where necessary, intersection improvements are identified.

This traffic report satisfies the traffic requirements of the City of Brea and is consistent with the current *Congestion Management Program (CMP) for Orange County.* The Scope of Work for this traffic study is included in ***Appendix A*** and was developed in conjunction with City of Brea Public Works Department staff and in consideration of comments of Caltrans staff.

The project site has been visited and an inventory of adjacent area roadways and intersections was performed. Existing weekday peak hour and Weekend (Saturday) Midday peak hour traffic count information has been collected at eighteen (18) key study intersections for use in the preparation of intersection level of service calculations. Information concerning cumulative projects (planned and/or approved) in the vicinity of the proposed Project has been researched at the Cities of Brea, Fullerton, Chino Hills, La Habra and Placentia. Based on our research, there are twenty-three (23) related projects in the City of Brea, two (2) related project in the City of Fullerton and seven (7)

related projects in the City of Chino Hills. The thirty-two (32) related projects were considered in the near-term cumulative traffic analysis for this project.

This traffic report analyzes existing and future weekday daily, AM peak hour and PM peak hour and weekend (Saturday) midday peak hour traffic conditions for a near-term (Year 2026) and long-term (Year 2045) traffic setting upon completion of the proposed Project. Near-term (Year 2026) cumulative daily and peak hour traffic forecasts were projected by incorporating a one percent (1.0%) annual growth rate and the trip generation potential of thirty-two (32) related projects. Long-term (Year 2045) daily and peak hour traffic forecasts were projected based on modeled traffic projections prepared by OCTA utilizing the OCTAM 5.0 Year 2045 Model.

## 1.2 Study Area

Eighteen (18) key study intersections have been identified for evaluation in collaboration with City of Brea staff. The eighteen (18) intersections listed below provide regional and local access to the study area and define the extent of the boundaries for this traffic investigation, as well as identifies the governing jurisdiction whose criteria have been applied to that intersection. It should be noted that cities that border the intersection but do not have governing jurisdictions are included in parentheses.

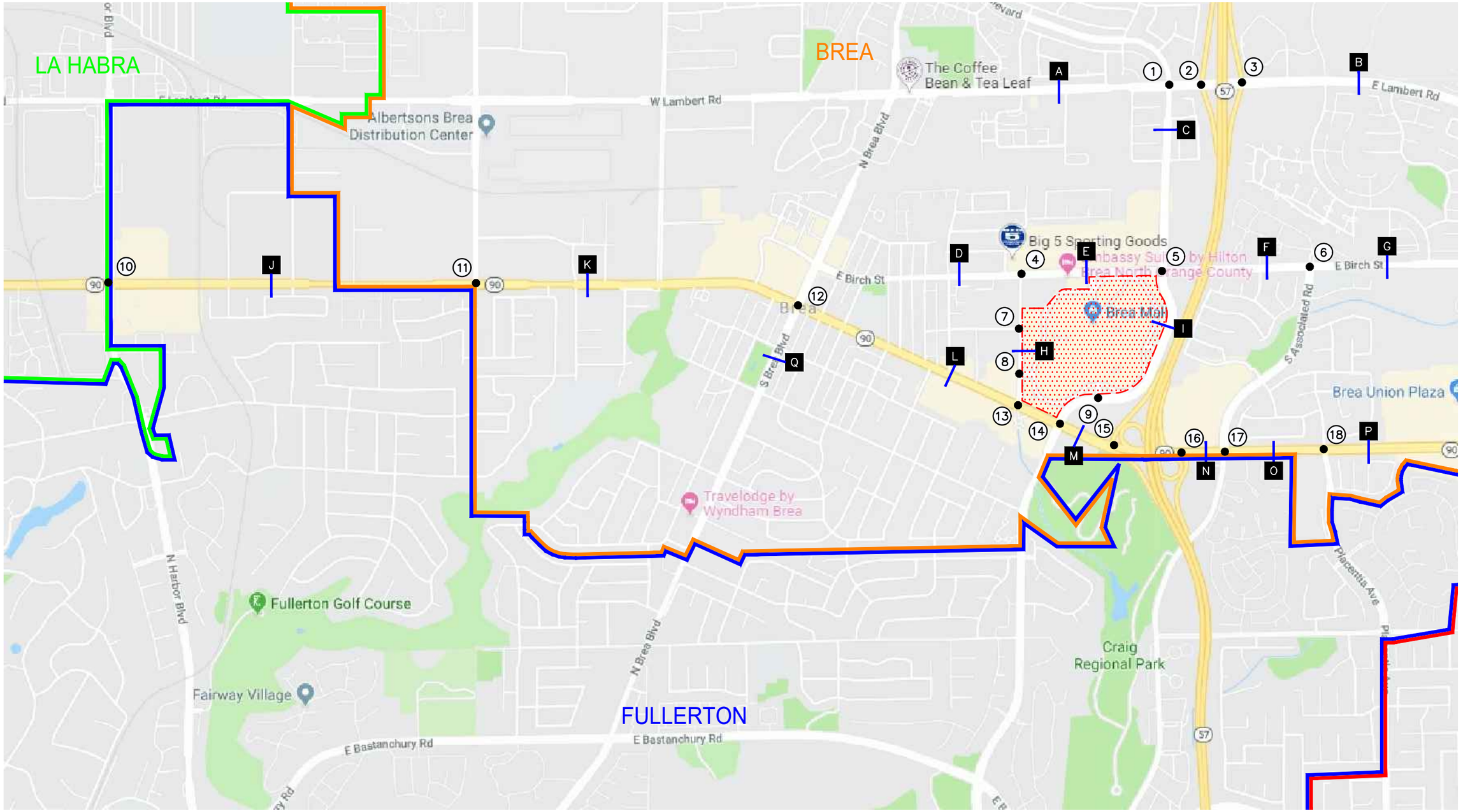
| Study Intersection | Applicable Jurisdiction (City Location) | | | |
|---|---|---|---|---|
| | Caltrans | City of Brea | City of La Habra | City of Fullerton |
| 1. State College Boulevard at Lambert Road | -- | Brea | -- | -- |
| 2. SR-57 SB Ramps at Lambert Road | Caltrans | (Brea) | -- | -- |
| 3. SR-57 NB Ramps at Lambert Road | Caltrans | (Brea) | -- | -- |
| 4. Randolph Avenue at Birch Street | -- | Brea | -- | -- |
| 5. State College Boulevard at Birch Street | -- | Brea | -- | -- |
| 6. S Associated Road at Birch Street | -- | Brea | -- | -- |
| 7. Randolph Avenue at Madison Way | -- | Brea | -- | -- |
| 8. Randolph Avenue at Brea Mall | -- | Brea | -- | -- |
| 9. Brea Mall South at State College Boulevard | -- | Brea | -- | -- |
| 10. Harbor Boulevard at Imperial Highway[1] | Caltrans | -- | (La Habra) | (Fullerton) |
| 11. Puente Street at Imperial Highway | Caltrans | (Brea) | -- | (Fullerton) |
| 12. Brea Boulevard at Imperial Highway | Caltrans | (Brea) | | |
| 13. Randolph Avenue at Imperial Highway | Caltrans | (Brea) | -- | -- |
| 14. State College Blvd at Imperial Highway[1] | Caltrans | (Brea) | -- | -- |
| 15. SR-57 SB Ramps at Imperial Highway[1] | Caltrans | (Brea) | -- | -- |
| 16. SR-57 NB Ramps at Imperial Highway[1] | Caltrans | (Brea) | -- | -- |
| 17. Associated Road at Imperial Highway | Caltrans | (Brea) | -- | -- |
| 18. Castlegate Ln/Placentia Ave at Imperial Hwy | Caltrans | (Brea) | -- | -- |

***Figure 1-1*** presents a Vicinity Map, which illustrates the general location of the proposed Project and depicts the study locations and surrounding street system. The Level of Service (LOS) calculations at these study locations were used to evaluate the need for potential Project-related

[1] Orange County Congestion Management Program (CMP) intersection.

improvements associated with area growth, cumulative projects and the proposed Project. When necessary, this report recommends intersection and/or roadway improvements that may be required to accommodate future traffic volumes and restore/maintain an acceptable Level of Service. Included in this Traffic Circulation Analysis are:

- Existing traffic counts,
- Estimated project traffic generation/distribution/assignment,
- Estimated cumulative project traffic generation/distribution/assignment,
- Weekday AM and PM peak hour and Weekend (Saturday) Midday peak hour capacity analyses for existing conditions,
- Weekday AM and PM peak hour and Weekend (Saturday) Midday peak hour capacity analyses for future near-term (Year 2026) traffic conditions without and with the proposed Project,
- Weekday AM and PM peak hour and Weekend (Saturday) Midday peak hour capacity analyses for future long-term (Year 2045) traffic conditions without and with the proposed Project,
- Intersection Vehicle Queueing Evaluation, and
- Site Access Evaluation.




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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: GOOGLE

KEY

(#) = STUDY INTERSECTION

# = STUDY ROADWAY SEGMENT

= BREA MALL

# FIGURE 1-1

## VICINITY MAP

BREA MALL MIXED-USE PROJECT, BREA

# 2.0 PROJECT DESCRIPTION

The Brea Mall is an existing regional shopping center that is located on approximately 74 acres of land in the City of Brea in northeast Orange County. The Brea Mall is located west of the State Route 57 (SR-57) Freeway and is generally bound by State College Boulevard to the east, Imperial Highway (State Route 91) to the south, Randolph Avenue to the west, and Birch Street to the north t. ***Figure 2-1*** is an existing aerial photograph of the Brea Mall.

## 2.1 Existing Brea Mall

The existing Brea Mall currently encompasses 1,291,433 square feet (SF) of Gross Leasable Area (GLA), of which 1,210,438 SF of GLA is occupied and consists of several major department stores and a central core of a mixture of retail shops and restaurant/food uses. Surrounding the retail core are several free-standing retail structures along the Brea Mall Circle, including the Olive Garden, Red Lobster, The Cheesecake Factory, and BJ's Restaurant.

As with any regional shopping center, the mall experiences periodic transitions in tenants and occupancy. The Sears department store, which is designated for demolition, was vacated in April 2018. However, during the time of traffic counts the first floor of the Sears department store had been re-occupied by Q's fashion retail store; the second floor of the Sears department store totaling 80,995 SF of GLA was still vacant.

As the above-described vacant space was not occupied on the dates that traffic counts were conducted for this study (i.e., weekday AM and PM peak period counts and Saturday midday peak period counts), and to account for trips corresponding with the mall's entitled and historically occupied square footage, trip generation for the 80,995 SF of vacant GLA was estimated based on the application of ITE rates/equations, and resulting trips were then assigned and added to the raw traffic counts collected at study intersections.

## 2.2 Proposed Project

The proposed Project consists of the redevelopment of 15.0 acres in the southwest portion of the Brea Mall property that includes the Sears parcel and adjoining transition areas adjacent to Nordstrom and Macy's. The proposed Project involves demolishing the former Sears department store and associated auto center (161,990 SF) and approximately 7.5 acres of surface parking to allow for the development of a mix of uses including retail, new restaurants, for-rent residential apartment, a resort-type fitness center, and a public gathering space (large "central green" plaza). The total conceptual limit of disturbance for the proposed Project to the existing Brea Mall site is approximately 15.0 acres.

Based on a review of the description of the retail component of the proposed Project, up to 247,415 SF of additional retail space, inclusive of a 50,000 SF sporting goods store and a 128,000 SF health club will be constructed. The residential component of the proposed Project, which would be developed south of the Nordstrom's parking structure, includes the development of a seven-story, 441,027 SF apartment podium with up to 383 apartment homes consisting of 28 studio units, 215 one-bedroom units and 140 two-bedroom units.

***Table 2-1*** provides the Project development summary. A review of *Table 2-1* indicates that upon completion of the Project, Brea Mall will have total GLA of 1,376,858 SF and a 383-unit apartment community. ***Figure 2-2*** illustrates the conceptual site plan for the Project prepared by Architects Orange.

## 2.3 Vehicular Site Access

The Brea Mall can be accessed from three of the four surrounding streets bordering the subject property, State College Boulevard, Randolph Avenue, and Birch Street; no vehicular access is provided from Imperial Highway. Vehicular access from Randolph Avenue is currently provided by two (2) signalized intersections, whereas one (1) signalized access is provided along Birch Street. From State College Boulevard, three (3) signalized intersections provide access to the Brea Mall. No change in access to the Brea Mall is proposed as a part of the Project. Since the Project is focused to the southwest portion of the Brea Mall property the southernmost driveways along Randolph Avenue and State College Boulevard are anticipated to be the focus of Project related trips.

## 2.4 Pedestrian and Bicycle Circulation

Brea Mall is surrounded by other commercial and public facilities and walkability between these properties as well as from existing and future residential uses is facilitated by existing sidewalks, traffic signals at intersections that immediately border the property and crosswalks. Review of current conditions indicates that pedestrian connectively between the mall and adjacent uses are provided via the existing sidewalk system and internal pedestrian pathways. Sidewalks are generally provided throughout the City along with crosswalks at most major intersections, and in particular sidewalks are provided along State College Boulevard, Birch Street, Randolph Avenue, and Imperial Highway bordering the site. Further, at each of the six (6) signalized intersections that provide access to the Brea Mall, crosswalks are provided to provide connectively across the streets that border the site. With the current pedestrian system now in place, access to and from the mall is adequate and will continue to serve the existing development as well as the proposed Project.

In addition to the pedestrian connectivity, the General Plan identifies future Class II bike lanes along Birch Street and State College Boulevard adjacent to the Brea Mall. These future bikeway additions will help improve mobility and direct connection to the surrounding facilities. To provide connectivity to the Class II bike lanes on Birch Street and State College Boulevard, Class II bike lanes and/or Sharrow bike lanes are proposed on the "ring road" and the signalized entries of the Brea Mall as a part of the Project. ***Figure 2-3*** illustrates the conceptual bikeway plan of the Project prepared by raSmith.

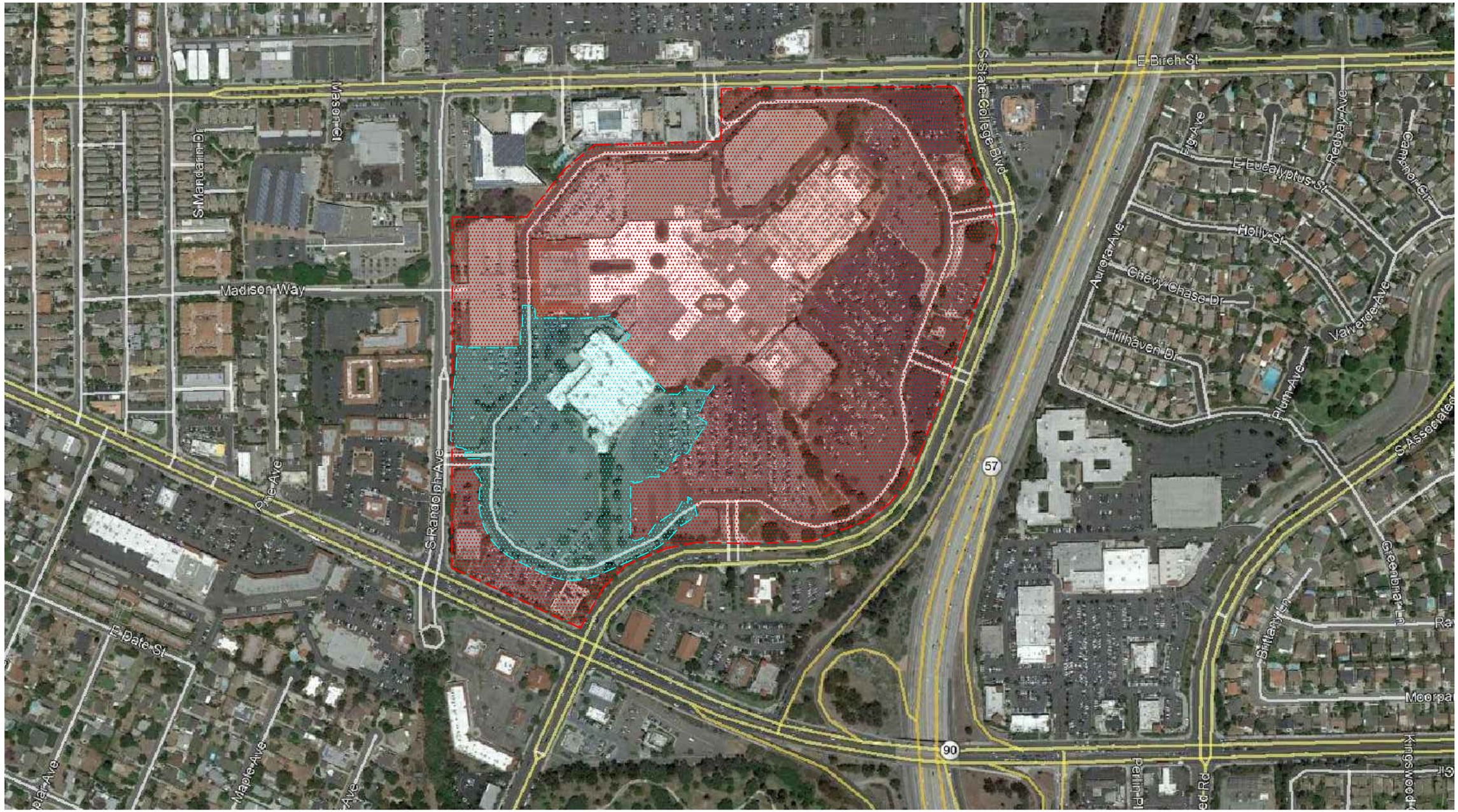
**TABLE 2-1**

**PROJECT DEVELOPMENT SUMMARY**

| Land Use/Project Description | Development Totals |
|---|---|
| ***Existing Occupied Brea Mall:*** | |
| ▪ Existing Occupied Mall | 1,210,438 SF GLA |
| ***Existing Occupied Brea Mall + Vacancy:*** | |
| ▪ Existing Occupied Mall | 1,210,438 SF GLA |
| ▪ Vacant Second Story Sears Tenant | 80,995 SF GLA |
| *Fully Occupied Brea Mall* | *1,291,433 SF GLA* |
| ***Existing Occupied Brea Mall + Proposed Project:*** | |
| ▪ Existing Occupied Mall | 1,210,438 SF GLA |
| ▪ Existing Occupied Mall to be Demolished | -80,995 SF GLA |
| ▪ Proposed Project Commercial[2] | |
| o Sporting Goods | 50,000 SF GLA |
| o Fitness Center | 128,000 SF GLA |
| o Non-Anchor Mall Retail | 69,415 SF GLA |
| *Existing Occupied Brea Mall + Proposed Project Subtotal* | *1,376,858 SF GLA* |
| ▪ Proposed Project Multifamily Homes[3] | |
| o Studio | 28 Units |
| o 1 Bedroom | 215 Units |
| o 2 Bedroom | 140 Units |
| *Proposed Residential* | *383 Units* |

[2] *Table 3-2 Brea Mall Mixed Use Project Land Use Summary,* received December 2, 2021.

[3] *Table 3-3A Residential Building A Summary,* received December 2, 2021.




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SOURCE: GOOGLE

KEY

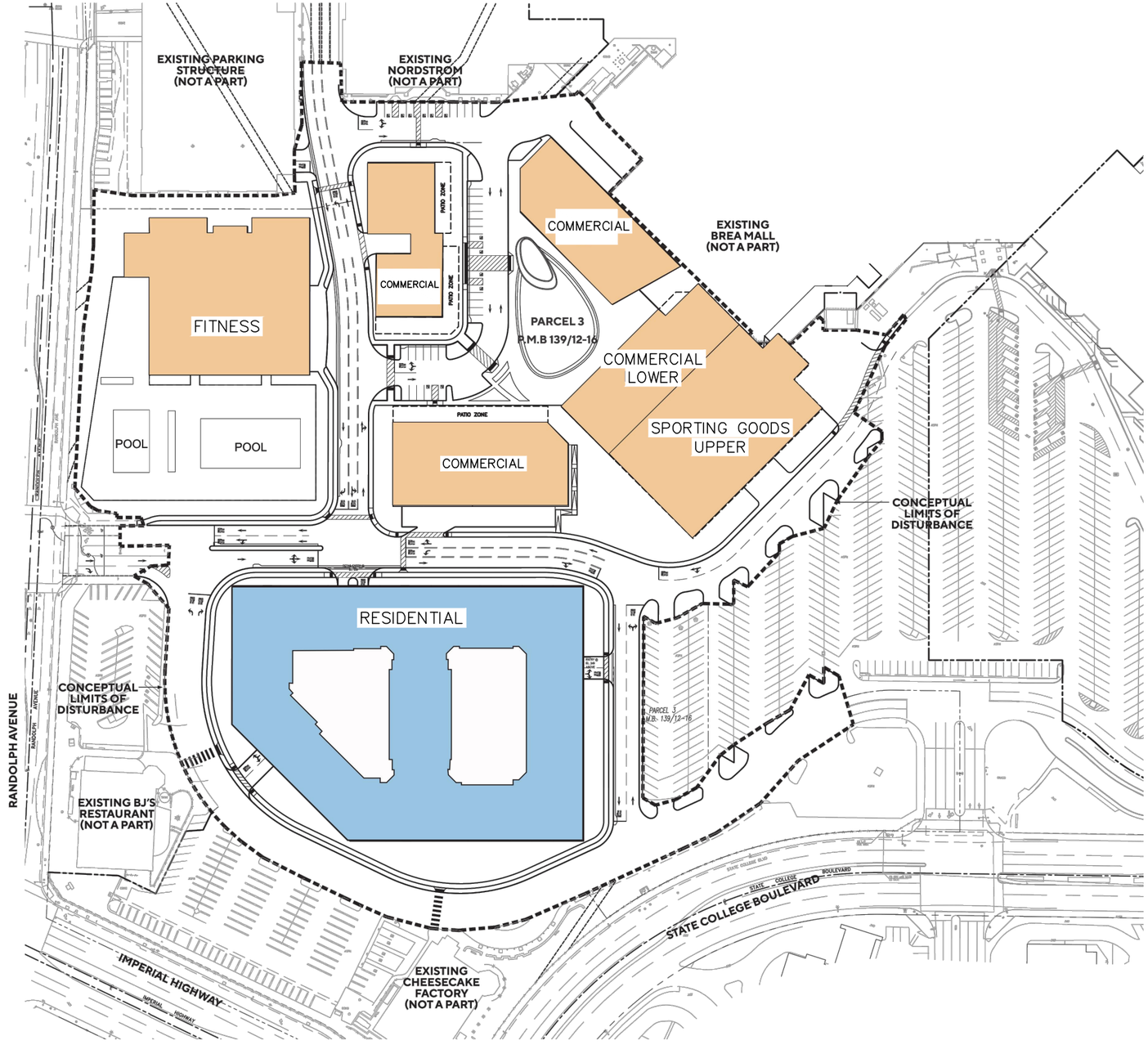
= BREA MALL

= PROJECT SITE

# FIGURE 2-1

## EXISTING AERIAL PHOTOGRAPH

BREA MALL MIXED-USE PROJECT, BREA




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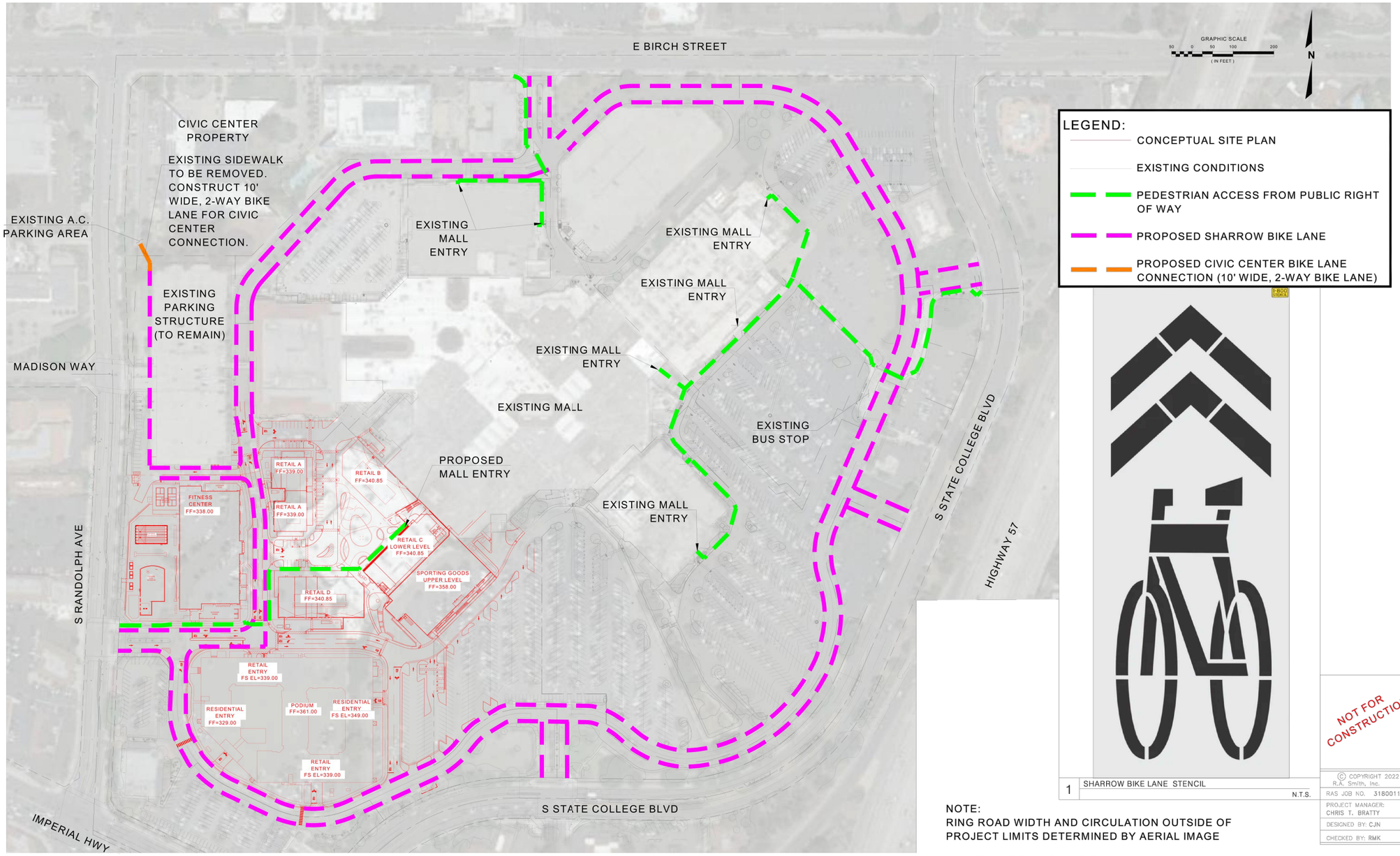
N NO SCALE

SOURCE: ARCHITECTURE AND DESIGN FIRM AO

# FIGURE 2-2

## PROPOSED SITE PLAN

BREA MALL EXPANSION & IMPROVEMENT, BREA






1 SHARROW BIKE LANE STENCIL N.T.S.

NOTE:
RING ROAD WIDTH AND CIRCULATION OUTSIDE OF PROJECT LIMITS DETERMINED BY AERIAL IMAGE

NOT FOR CONSTRUCTION

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R.A. Smith, Inc.

RAS JOB NO. 3180011.03
PROJECT MANAGER: CHRIS T. BRATTY
DESIGNED BY: CJN
CHECKED BY: RMK

**BREA MALL AND RESIDENCES AT BREA**
1065 Brea Mall, Brea, CA 92821

MULTI-MODAL EXHIBIT

raSmith
CREATIVITY BEYOND ENGINEERING
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Irvine, CA 92618-4237
(949) 872-2378
rasmith.com

1 OF 1
Scale 1" = 100'
Job No. 2018-170

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N NO SCALE

SOURCE: RASMITH

# FIGURE 2-3

## CONCEPTUAL BIKEWAY PLAN
BREA MALL MIXED-USE PROJECT, BREA

# 3.0 EXISTING CONDITIONS

## 3.1 Existing Street System

The principal local network of streets serving the project site includes Lambert Road, Birch Street, Imperial Highway, Brea Boulevard, and State College Boulevard. The following discussion provides a brief synopsis of these key area streets. The descriptions are based on an inventory of existing roadway conditions.

**Lambert Road** is a six-lane, divided roadway west of Kraemer Boulevard and a four-lane, divided roadway east of Kraemer Boulevard, oriented in the east-west direction. The posted speed limit on Lambert Road is 45 miles per hour (mph) west of SR-57 Freeway and 50 miles per hour (mph) east of SR-57 Freeway. On-street parking is not permitted along this roadway. Traffic signals control the study intersections of Lambert Road at Puente Street, Brea Boulevard, State College Boulevard, SR-57 SB Ramps, SR-57 NB Ramps, and Santa Fe Road/Kraemer Boulevard. Lambert Road is designated as a Major Arterial in the City's Master Plan of Roadways.

**Birch Street** is a four-lane, divided roadway oriented in the east-west direction that borders the Brea Mall on the north. The posted speed limit on Birch Street is 50 miles per hour (mph). On-street parking is not permitted along this roadway. Traffic signals control the study intersections of Birch Street at Brea Boulevard, Randolph Avenue, State College Boulevard, S Associated Road, N Associated Road, and Kraemer Boulevard. Birch Street Road is designated as a Secondary Arterial in the City's Master Plan of Roadways, except between Randolph Avenue and Associated Road, where it is designated as a Primary Arterial.

**Imperial Highway** is a six-lane, divided roadway generally oriented in the east-west direction. The posted speed limit on Imperial Highway is 45 miles per hour (mph) west of the SR-57 Freeway and 50 miles per hour (mph) east of the SR-57 Freeway. On-street parking is not permitted along this roadway. A traffic signal controls the study intersections of Imperial Highway at Harbor Boulevard, Puente Street, Brea Boulevard, Randolph Avenue, State College Boulevard, SR-57 SB Ramps, SR-57 NB Ramps, Associated Road, Placentia Avenue, and Kraemer Boulevard. Imperial Highway is designated as a Smart Street in the City's Master Plan of Roadways.

**Brea Boulevard** is a four-lane, divided roadway generally oriented in the north-south direction. The posted speed limit on Brea Boulevard is 40 miles per hour (mph) south of Imperial Highway and 35 miles per hour (mph) north of Imperial Highway. On-street parking is not permitted along this roadway. A traffic signal controls the study intersections of Brea Boulevard at Bastanchury Road, Imperial Highway, Birch Street, and Lambert Road. Brea Boulevard is designated as a Major Arterial, south of Imperial Highway, and a Primary Arterial, north of Imperial Highway, in the City's Master Plan of Roadways.

**State College Boulevard** is a four-lane, divided roadway generally oriented in the north-south direction that borders the Brea Mall on the east. The posted speed limit on State College Boulevard is 40 miles per hour (mph). On-street parking is not permitted along this roadway. A traffic signal controls the study intersections of State College Boulevard at Bastanchury Road, Imperial Highway,

Birch Street, and Lambert Road. State College Boulevard is designated as a Major Arterial, south of Imperial Highway, a Primary Arterial, between Imperial Highway and Birch Street, and a Secondary Arterial, north of Birch Street, in the City's Master Plan of Roadways.

**Randolph Avenue** is a four-lane, divided roadway oriented in the north-south direction that borders the Brea Mall on the west. The posted speed limit on Randolph Avenue is 40 miles per hour (mph). On-street parking is not permitted along this roadway. Traffic signals control the study intersections of Randolph Avenue at Madison Way/Brea Mall and Brea Mall.

***Figure 3-1*** presents an inventory of the existing roadway conditions for the arterials and intersections evaluated in this report. This figure identifies the number of travel lanes for key arterials, as well as intersection configurations and controls for the key area study intersections.

## 3.2 Existing Public Transit

Public transit bus service is provided in the project area by the Orange County Transportation Authority (OCTA). Within the subject property, the Brea Transit Center is Five (5) OCTA bus routes operate within the vicinity of the Project site on Birch Street and State College Boulevard, which consist of the following:

- OCTA Route 57 (Brea to Newport Beach): Route 57 is a local bus route serving the Cities of Brea, Fullerton, Anaheim, Orange, Santa Ana, Costa Mesa, and Newport Beach. The major routes of travel include State College Boulevard and Bristol Street. Nearest to the project site are bus stops along State College Boulevard at the intersections of Imperial Highway and Birch Street. Route 57 operates on approximate 15-minute headways during weekdays and 30-minute headways on weekends. The Brea Mall Transit Center is served by this bus route.
- OCTA Route 129 (La Habra to Anaheim): Route 129 is a community bus route serving the Cities of Anaheim, Placentia, Yorba Linda, Brea, and La Habra. The major routes of travel include La Habra Boulevard, Brea Boulevard, Birch Street, and Kraemer Boulevard. Nearest to the project site are bus stops along Brea Boulevard at the intersection of Birch Street. Route 129 operates on approximate 30-minute headways during weekdays and 60-minute headways on weekends. The Brea Mall Transit Center is served by this bus route.
- OCTA Route 143 (La Habra to Brea): Route 143 is a community bus route serving the Cities of Fullerton, Brea, and La Habra. The major routes of travel include Whittier Boulevard, Harbor Boulevard, Brea Boulevard, and Birch Street. Nearest to the project site are bus stops on Brea Boulevard at Imperial Highway, Birch Street at Randolph Avenue, Birch Street at State College Boulevard, and at Brea Mall. Route 143 operates on approximate 75-minute headways during weekdays and 65-minute headways on weekends. The Brea Mall area is served by this bus route.
- OCTA Route 153 (Brea to Anaheim): Route 153 is a community bus route serving the Cities of Brea, Placentia, Fullerton, Anaheim, and Orange. The major routes of travel include Placentia Avenue. Nearest to the project site are bus stops on Birch Street at the intersection with State College Boulevard. Route 153 operates on approximate 60-minute headways during weekdays and weekends. The Brea Mall Transit Center is served by this bus route.
- OCTA Route 213 (Brea to Irvine Express). Route 213 is an express bus route serving the Cities of Brea, Placentia, Fullerton, Anaheim, Orange, Tustin, Santa Ana, and Irvine via the SR-55

Freeway. Nearest to the project site are bus stops on Brea Boulevard at the intersection with Birch Street. Route 213 operates on approximate 30-minute headways during weekday peak hours; no bus service is provided on the weekends. The Brea Mall Transit Center is served by this bus route.

***Figure 3-2*** graphically illustrates the transit routes of OCTA within the vicinity of the Project site. ***Figure 3-3*** graphically illustrates the directional transit routes of OCTA within the Brea Mall site. ***Figure 3-4*** identifies the location of the existing bus stops in proximity to the Project site.

As shown in *Figure 3-3*, access to public transit is provided via bus stops along Birch Street and State College Boulevard, inclusive of the site's signalized intersections. Further a transit center/hub is located within the existing Brea Mall site and is served by four (4) OCTA bus routes.

## 3.3 Existing Bikeway Plan

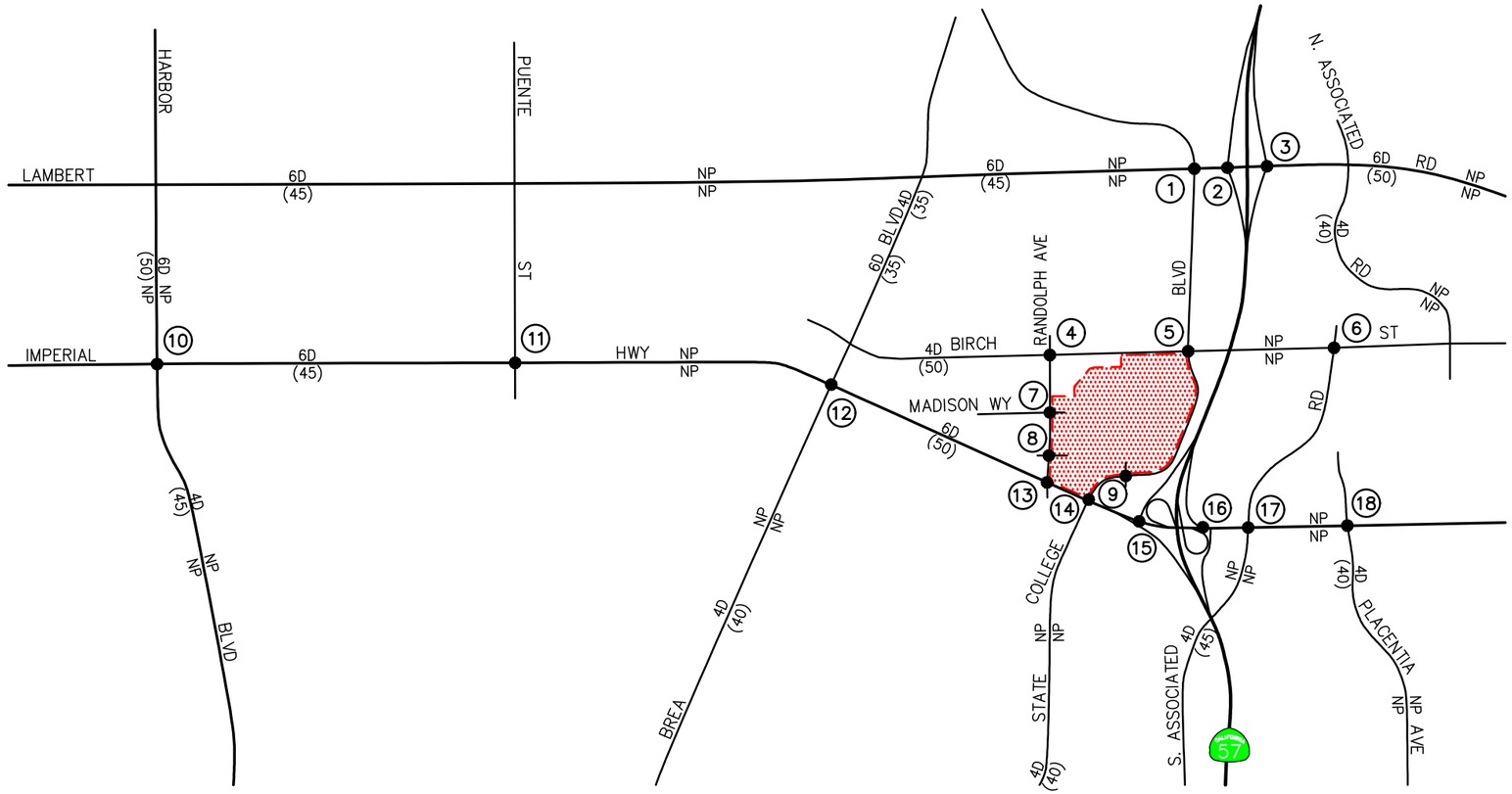
The City of Brea promotes bicycling as a means of mobility and a way in which to improve the quality of life within its community. The Bikeway Plan recognizes the needs of bicycle users and aims to create a complete and safe bicycle network throughout the City. The City of Brea Bike Plan (existing and proposed) is shown on ***Figure 3-5***. In close proximity to the site, an existing Class II bike lane is provided along Birch Street, from just west of State College Boulevard to the east, east of SR-57 Freeway and State College Boulevard, north of Birch Street. The Tracks at Brea, which are separated east/west Class I bikeway facility, is located on block to the north of the Brea Mall. There is a proposed Class II bike lane along Birch Street to the west and along State College Boulevard to the south.

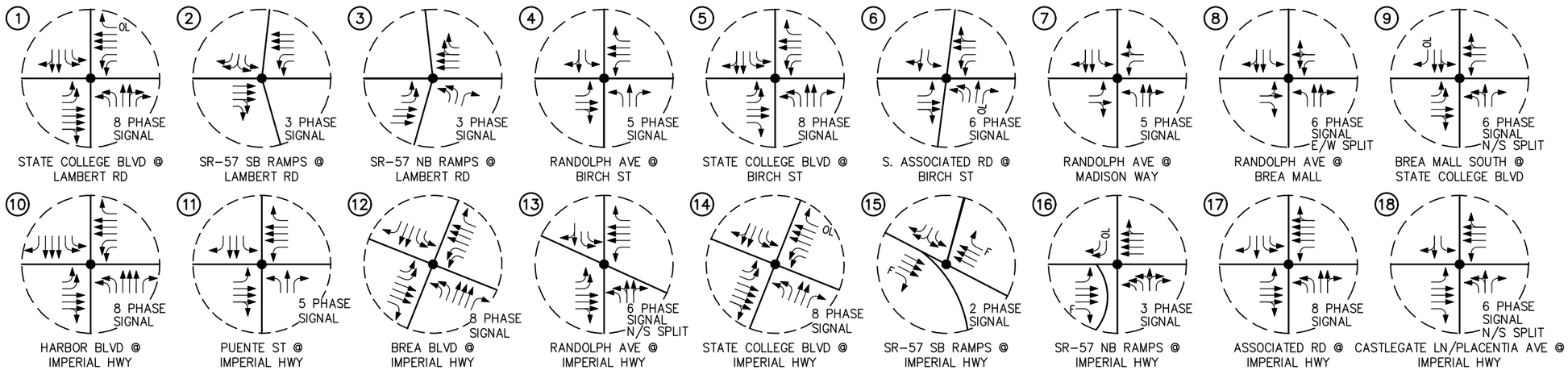
## 3.4 Existing Traffic Volumes

Eighteen (18) key study intersections and seventeen (17) roadway segments have been identified as the locations at which to evaluate existing and future traffic operating conditions. Some portion of potential project-related traffic will pass through each of these intersections. These key locations were selected for evaluation based on discussions with City of Brea staff.

Existing weekday daily, AM peak hour and PM peak hour and weekend daily and Midday peak hour traffic volumes for the eighteen (18) key study intersections and seventeen (17) roadway segments were obtained from manual turning movement counts conducted by National Data and Surveying Services in 2018 or 2019. To account for recently occupied developments such as In-N-Out which is located at Randolph Avenue and Imperial Highway, a conservative growth factor of 5% has been applied to the Year 2018/2019 conditions to establish Year 2022 pre-COVID-19 baseline traffic conditions.

As discussed previously, approximately 80,995 SF GLA of mall space was not occupied on the dates that traffic counts were conducted. To address this, and to account for trips corresponding with the mall's entitled and historically occupied square footage, trip generation for this floor area was estimated based on the application of ITE rates/equations, and resulting trips were then assigned to the street system and added to the raw traffic counts collected at the key intersections.




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N NO SCALE

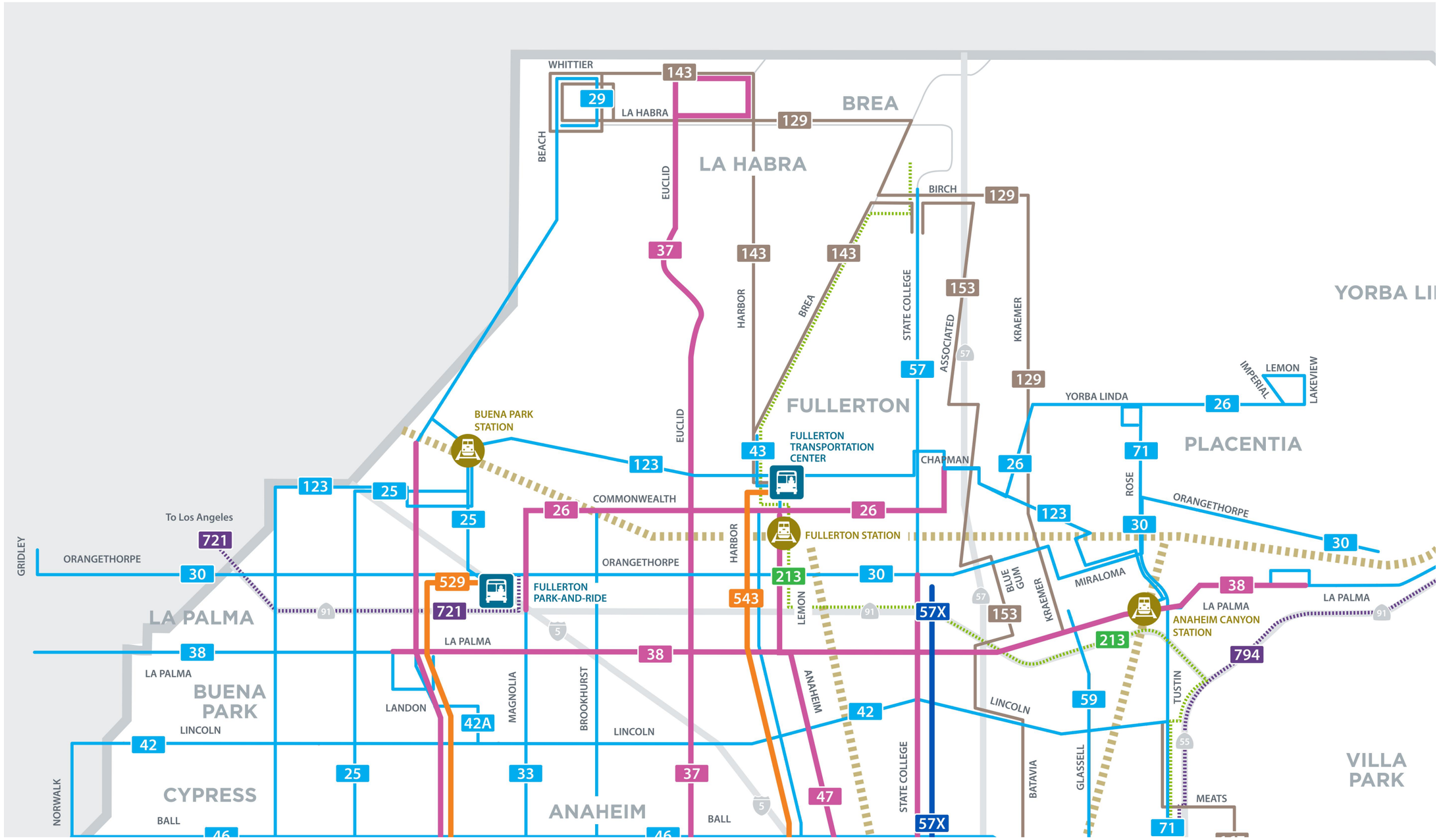
KEY

← = APPROACH LANE ASSIGNMENT
● = TRAFFIC SIGNAL, ▼ = STOP SIGN
P = PARKING, NP = NO PARKING
U = UNDIVIDED, D = DIVIDED
2 = NUMBER OF TRAVEL LANES
(XX)= POSTED SPEED LIMIT (MPH)
F = FREE-RIGHT
OL = OVERLAP
▒ = BREA MALL

# FIGURE 3-1

## EXISTING ROADWAY CONDITIONS AND INTERSECTION CONTROLS

BREA MALL EXPANSION & IMPORVEMENTS, BREA




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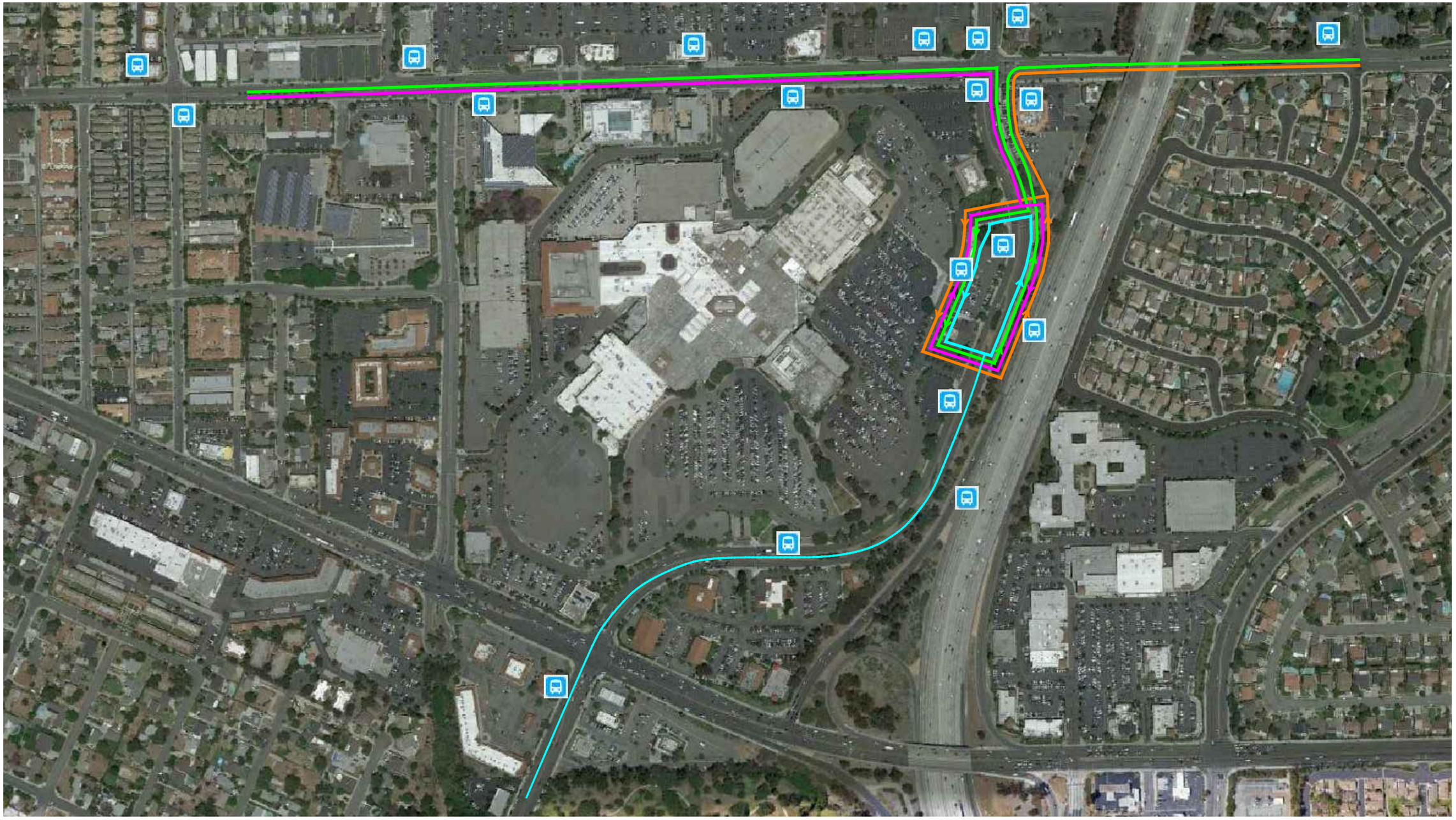
NO SCALE

SOURCE: OCTA

# FIGURE 3–2

## OCTA ROUTES

BREA MALL MIXED–USE PROJECT, BREA



n:\4000\2194099 - brea mall expansion & improvement, brea\dwg\4099 f3-3.dwg LDP 13:07:16 04-14-2022 kopulsky

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: CITY OF BREA

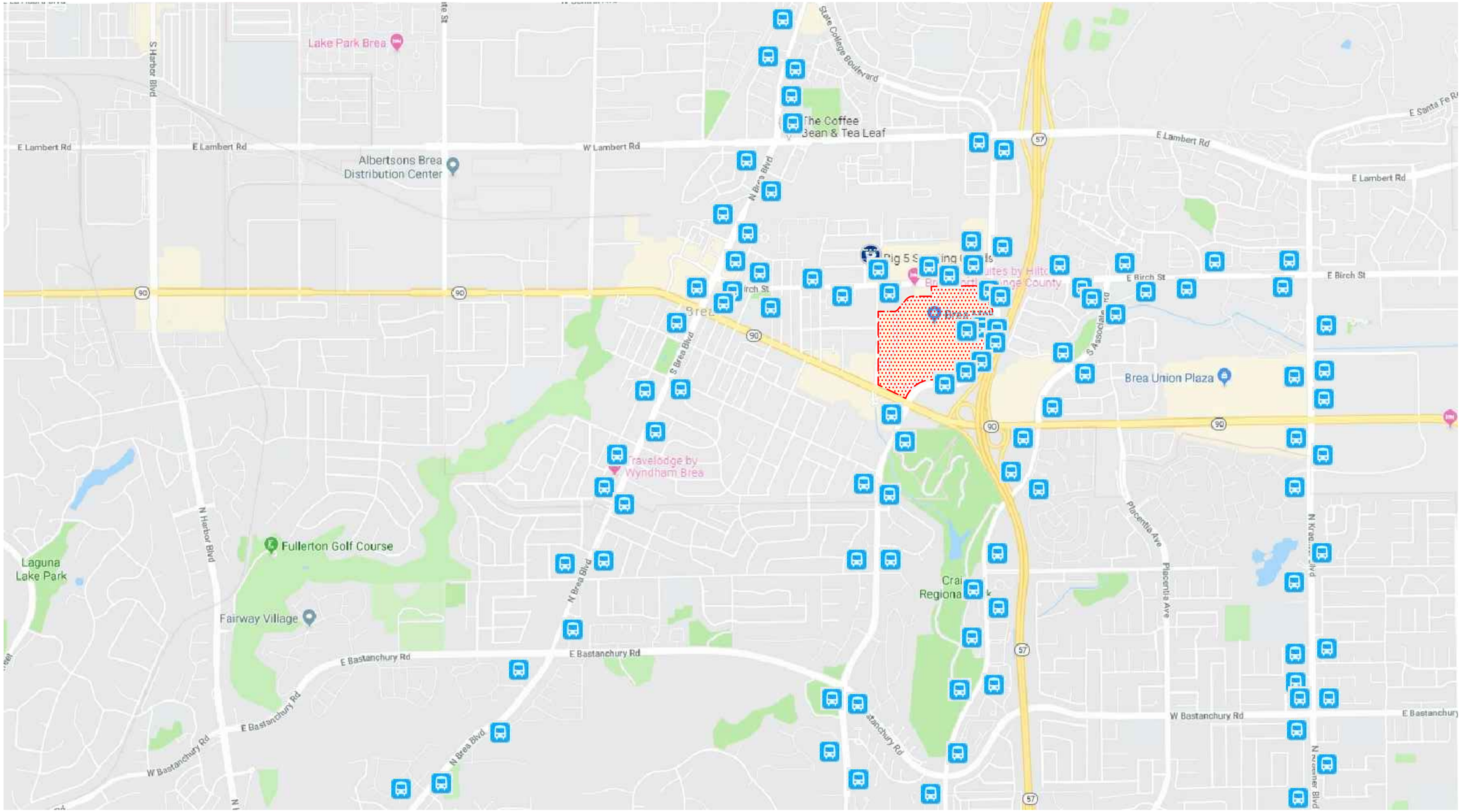
KEY

= ROUTE 57
= ROUTE 129
= ROUTE 143
= ROUTE 153
= TRANSIT STOP

# FIGURE 3-3

## OCTA ROUTES WITHIN BREA MALL SITE

BREA MALL MIXED-USE PROJECT, BREA




n:\4000\2194099 - brea mall expansion & improvement, brea\dwg\4099 f3-4.dwg LDP 13:07:23 04-14-2022 kopulsky

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: GOOGLE

KEY

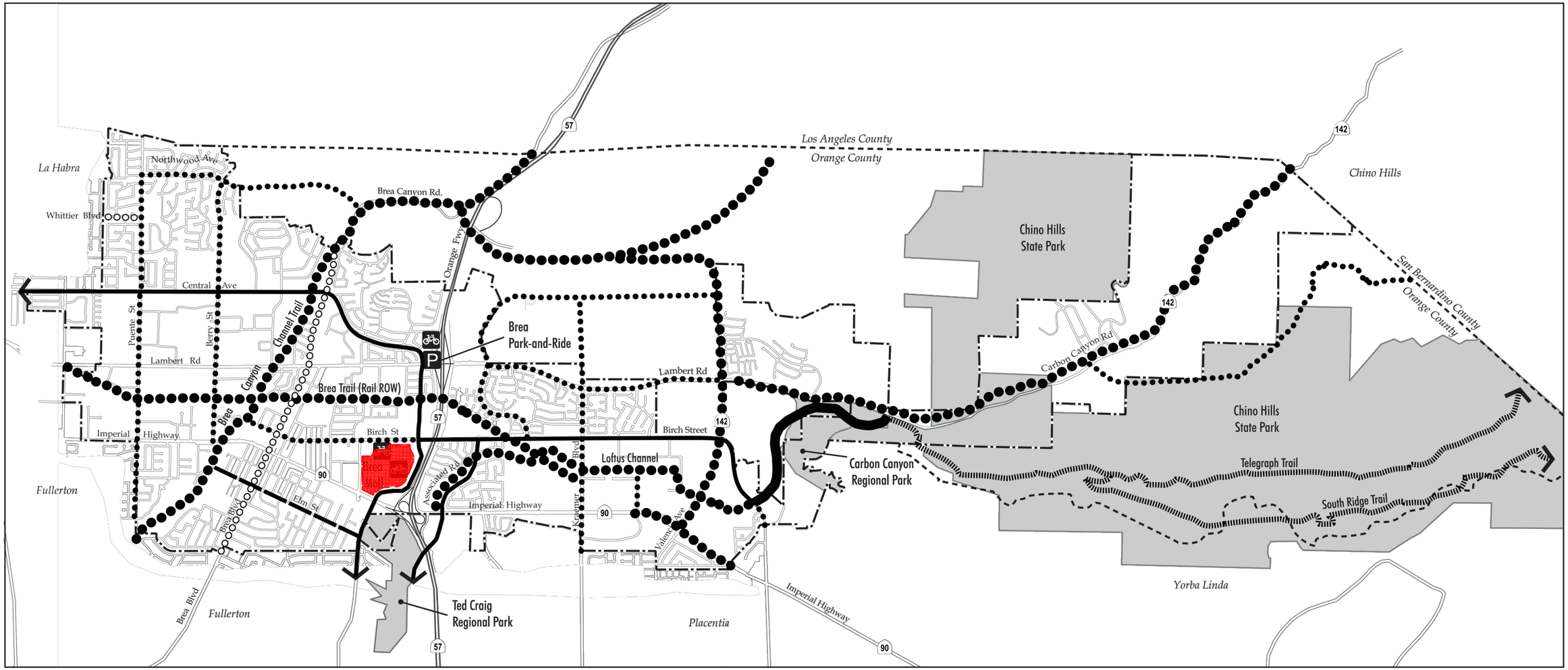
= PROJECT SITE

= TRANSIT STOP

# FIGURE 3-4

## TRANSIT STOP LOCATIONS

BREA MALL MIXED-USE PROJECT, BREA




**Legend**

- City Boundary
- Sphere of Influence

**Bike Ways**

- Bike Path (Class I)
- Bike Lane (Class II)
- Bike Route (Class III)
- Off Road (Unpaved)

**Bike Ways (Proposed)**

- Bike Path (Class I)
- Bike Lane (Class II)
- Bike Route (Class III)

- Park and Ride
- Bike Parking Facility

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LINSCOTT LAW & GREENSPAN engineers

NO SCALE

SOURCE: CITY OF BREA

# FIGURE 3-5

**CITY OF BREA BIKE PLAN**

BREA MALL MIXED-USE PROJECT, BREA

***Figures 3-6*** and ***3-7*** illustrate the existing weekday AM and PM peak hour traffic volumes at the eighteen (18) key study intersections evaluated in this report, respectively. *Figure 3-7* also presents the existing average weekday daily traffic volumes for the seventeen (17) roadway segments in the vicinity of the proposed Project.

***Figure 3-8*** illustrates the existing weekend (Saturday) Midday peak hour traffic volumes at the eighteen (18) key study intersections evaluated in this report, respectively. *Figure 3-8* also presents the existing average weekend daily traffic volumes for the seventeen (17) roadway segments in the vicinity of the proposed Project.

***Appendix B*** contains the detailed peak hour and daily traffic count sheets for the key intersections and roadway segments evaluated in this report.

## 3.5 Level Of Service (LOS) Analysis Methodologies

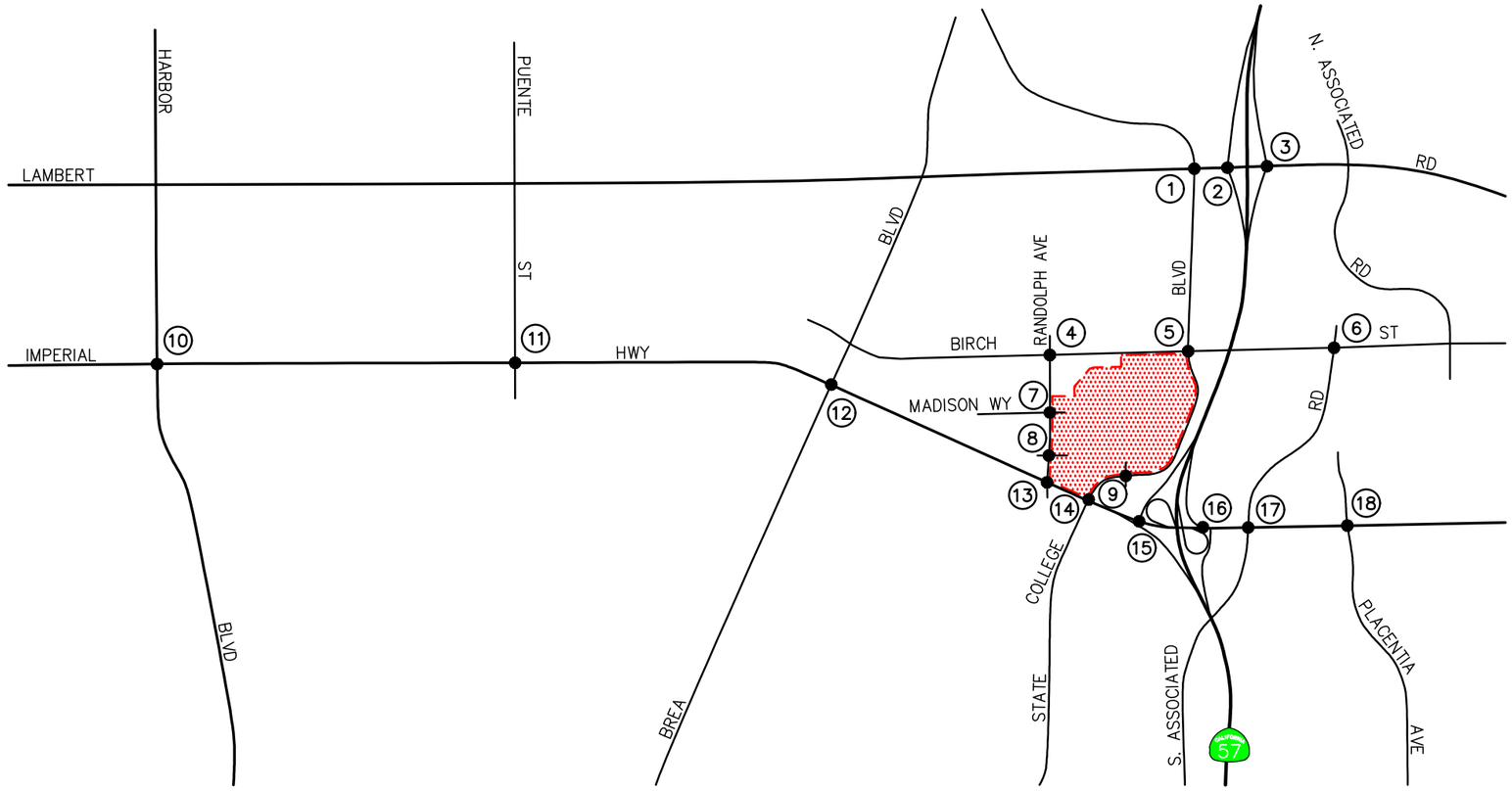
Existing weekday AM and PM peak hour operating conditions for the study intersections were evaluated using the *Intersection Capacity Utilization* (ICU) methodology for signalized intersections as well as the methodology outlined in the *Highway Capacity Manual*. Per the City's direction, the Intersection Capacity Utilization (ICU) method will be used for the purpose of consistency with the City of Brea General Plan.

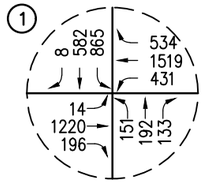
### 3.5.1 *Intersection Capacity Utilization (ICU) Method of Analysis*

In conformance with City of Brea and Orange County CMP requirements, existing weekday AM and PM peak hour and Weekend (Saturday) Midday peak hour operating conditions for the key signalized study intersections were evaluated using the Intersection Capacity Utilization (ICU) method. The ICU technique is intended for signalized intersection analysis and estimates the volume to capacity (V/C) relationship for an intersection based on the individual V/C ratios for key conflicting traffic movements. The ICU numerical value represents the percent signal (green) time, and thus capacity, required by existing and/or future traffic. It should be noted that the ICU methodology assumes uniform traffic distribution per intersection approach lane and optimal signal timing.

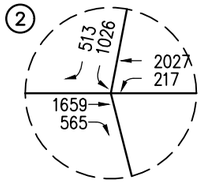
Per City of Brea per City of La Habra requirements, the ICU calculations use a lane capacity of 1,700 vehicles per hour (vph) for through and all turn lanes. A clearance adjustment factor of 0.05 was added to each Level of Service calculation.

The ICU value translates to a Level of Service (LOS) estimate, which is a relative measure of the intersection performance. The ICU value is the sum of the critical volume to capacity ratios at an intersection; it is not intended to be indicative of the LOS of each of the individual turning movements. The six qualitative categories of Level of Service have been defined along with the corresponding ICU value range and are shown in ***Table 3-1***.

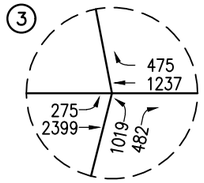


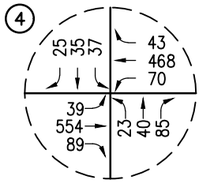

STATE COLLEGE BLVD @ LAMBERT RD



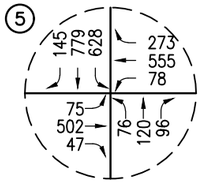

SR-57 SB RAMPS @ LAMBERT RD



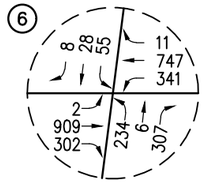

SR-57 NB RAMPS @ LAMBERT RD



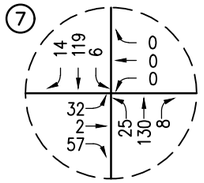

RANDOLPH AVE @ BIRCH ST



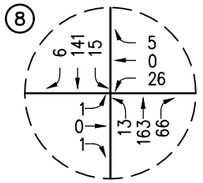

STATE COLLEGE BLVD @ BIRCH ST



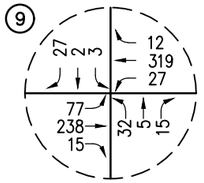

S. ASSOCIATED RD @ BIRCH ST



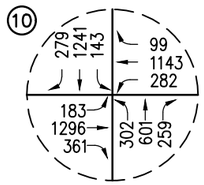

RANDOLPH AVE @ MADISON WAY



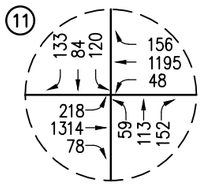

RANDOLPH AVE @ BREA MALL



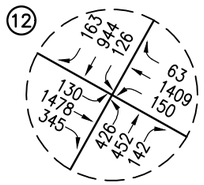

BREA MALL SOUTH @ STATE COLLEGE BLVD



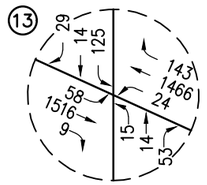

HARBOR BLVD @ IMPERIAL HWY



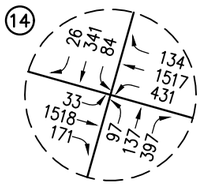

PUENTE ST @ IMPERIAL HWY



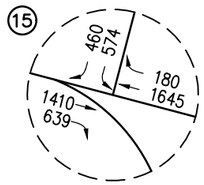

BREA BLVD @ IMPERIAL HWY



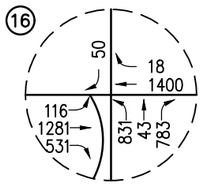

RANDOLPH AVE @ IMPERIAL HWY



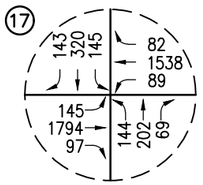

STATE COLLEGE BLVD @ IMPERIAL HWY



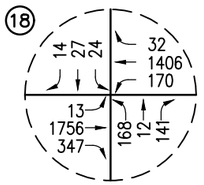

SR-57 SB RAMPS @ IMPERIAL HWY




SR-57 NB RAMPS @ IMPERIAL HWY




ASSOCIATED RD @ IMPERIAL HWY




CASTLEGATE LN/PLACENTIA AVE @ IMPERIAL HWY

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

= BREA MALL

# FIGURE 3-6

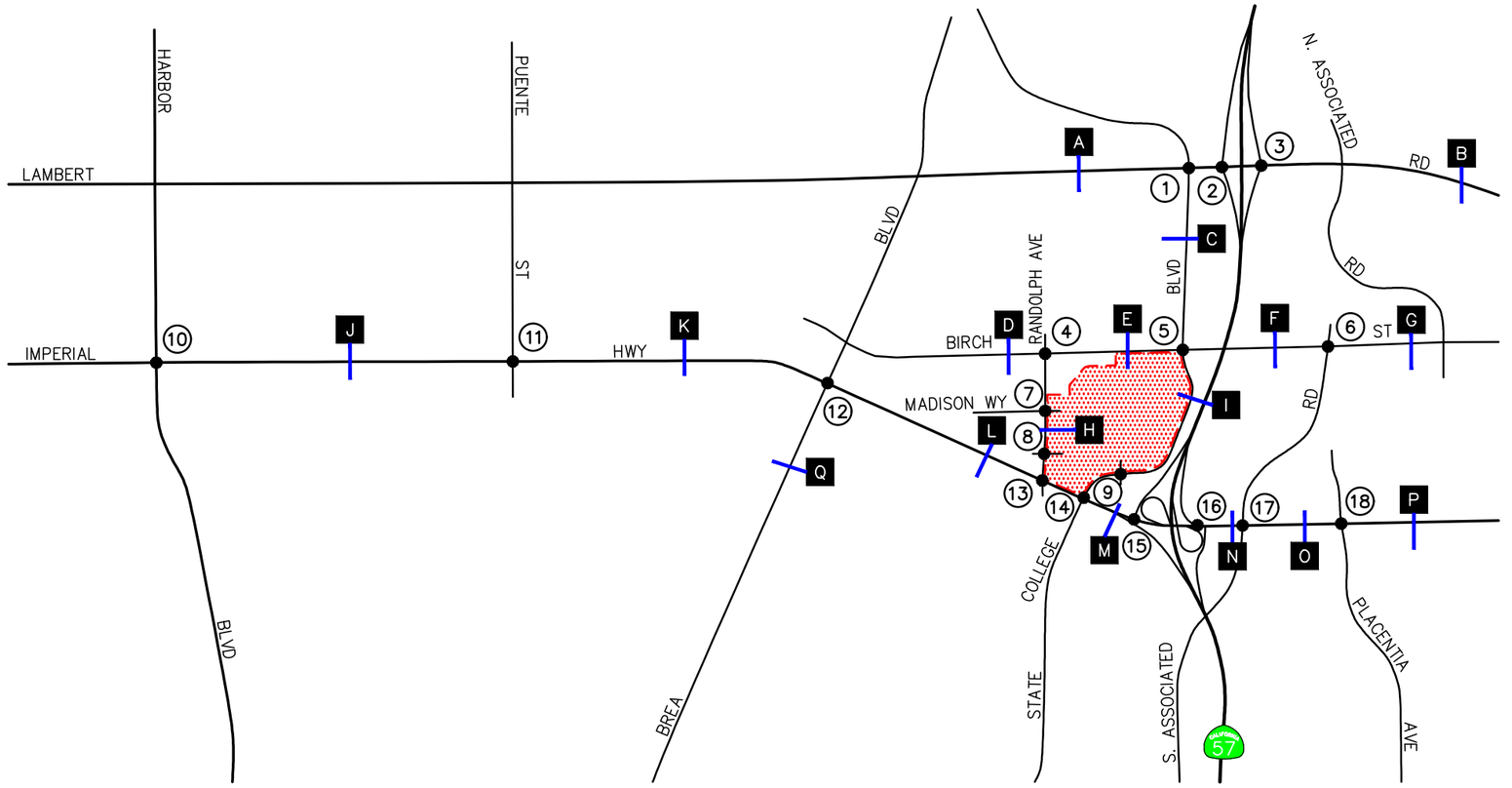
## EXISTING AM PEAK HOUR TRAFFIC VOLUMES

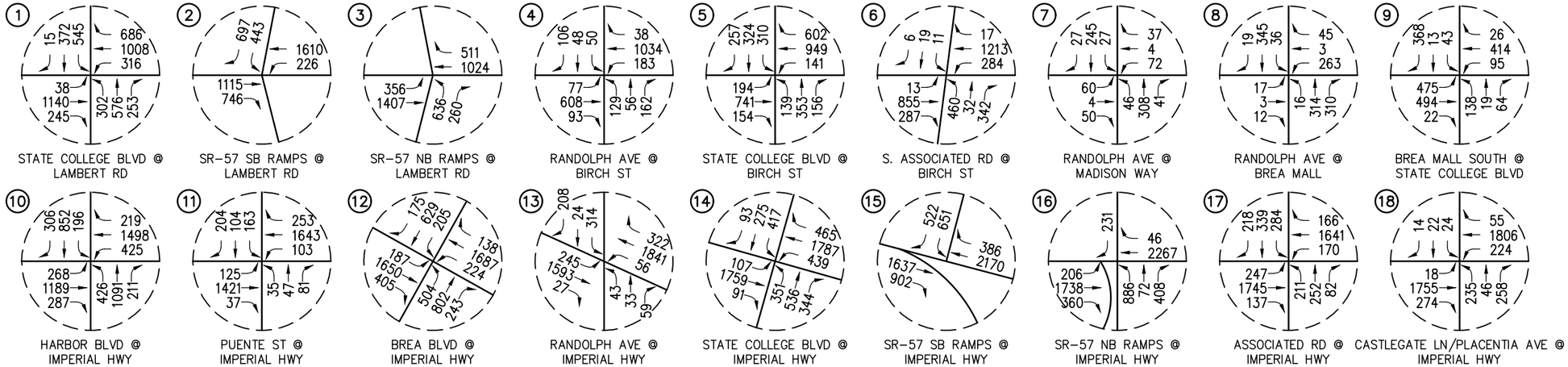
BREA MALL EXPANSION & IMPORVEMENTS, BREA



n:\4000\2194099 - brea mall expansion & improvement, brea\dwg\4099 f3-6.dwg LDP 14:16:47 04-14-2022 kopulsky

| LOCATION | VOLUME |
|---|---|
| A | 39,014 |
| B | 35,105 |
| C | 22,844 |
| D | 18,761 |
| E | 20,308 |
| F | 25,979 |
| G | 25,457 |
| H | 7,991 |
| I | 14,256 |
| J | 44,414 |
| K | 59,117 |
| L | 56,226 |
| M | 76,169 |
| N | 56,548 |
| O | 54,291 |
| P | 54,375 |
| Q | 32,194 |




LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

# = STUDY ROADWAY SEGMENT

= BREA MALL

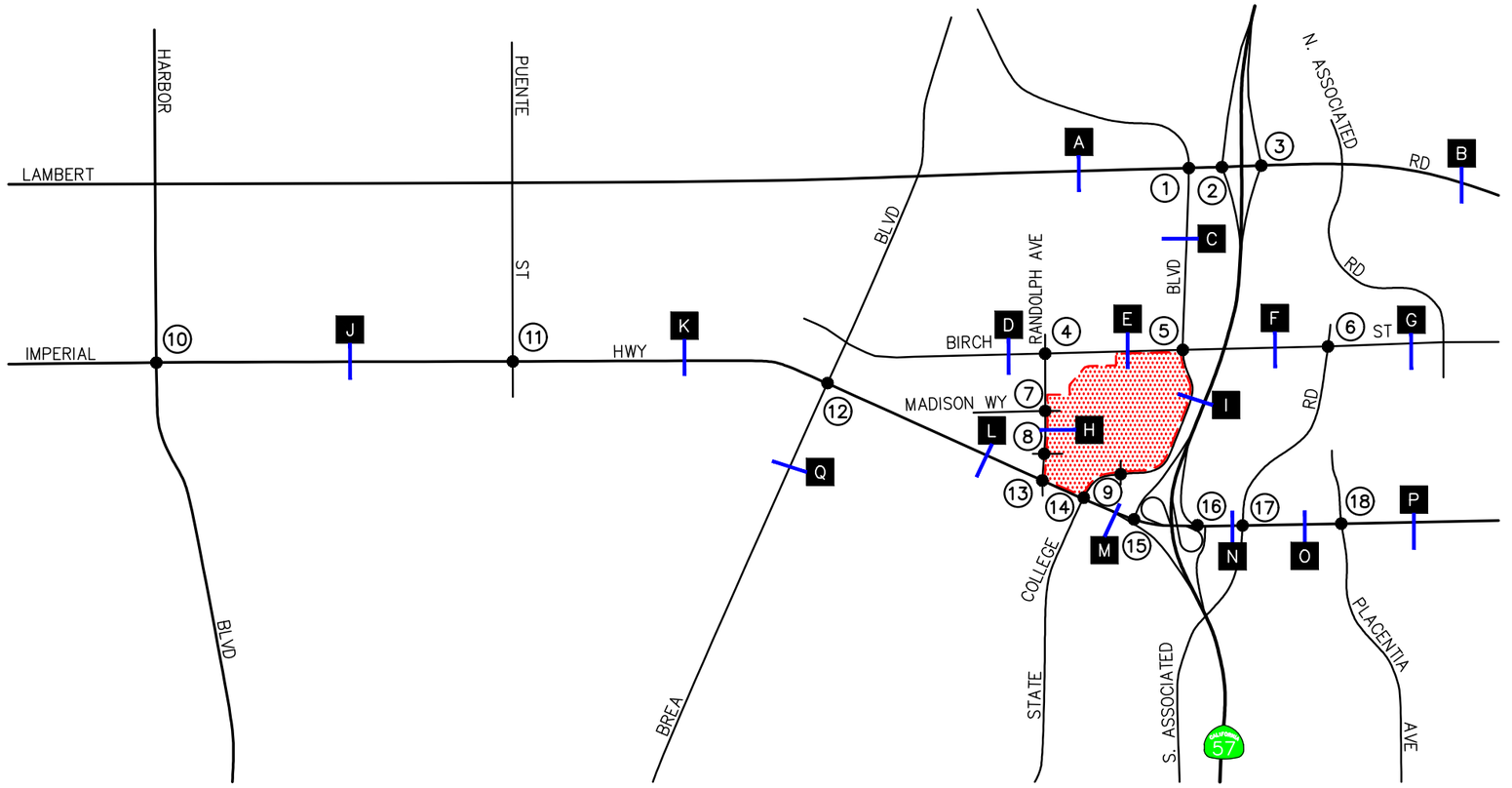
# FIGURE 3-7

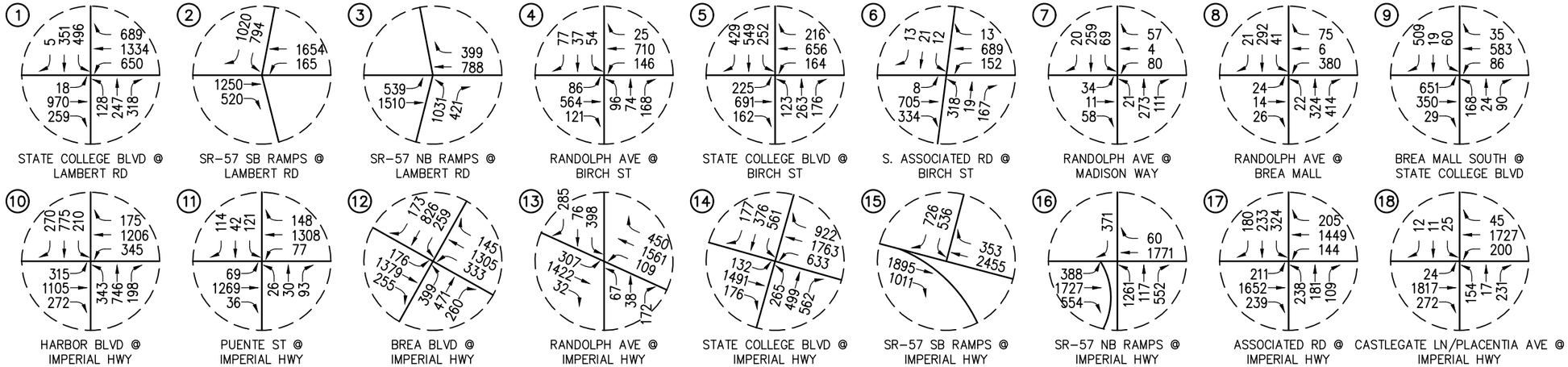
## EXISTING PM PEAK HOUR AND DAILY TRAFFIC VOLUMES

BREA MALL EXPANSION & IMPORVEMENTS, BREA

n:\4000\2194099 - brea mall expansion & improvement, brea\dwg\4099 f3-7.dwg LDP 14:16:51 04-14-2022 kopulsky

| LOCATION | VOLUME |
|---|---|
| A | 40,553 |
| B | 36,493 |
| C | 23,757 |
| D | 19,511 |
| E | 18,220 |
| F | 27,007 |
| G | 26,465 |
| H | 8,219 |
| I | 14,833 |
| J | 46,187 |
| K | 61,480 |
| L | 58,496 |
| M | 79,245 |
| N | 58,813 |
| O | 56,462 |
| P | 56,536 |
| Q | 33,481 |




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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY
(#) = STUDY INTERSECTION
# = STUDY ROADWAY SEGMENT
= BREA MALL

# FIGURE 3-8

EXISTING WEEKEND (SATURDAY) MIDDAY PEAK HOUR AND DAILY TRAFFIC VOLUMES
BREA MALL EXPANSION & IMPORVEMENTS, BREA

### 3.5.2 *Highway Capacity Manual (HCM) Method of Analysis (Signalized Intersections)*

Existing weekday AM and PM peak hour and Weekend (Saturday) Midday peak hour operating conditions for key study intersections under City of Brea, City of Fullerton and/or Caltrans jurisdiction were evaluated using the methodology outlined in *Chapter 19 of the Highway Capacity Manual 6 (HCM 6)* for signalized intersections, the methodology outlined in *Chapter 20 of the HCM 6* for two-way stop-controlled intersections.

Based on the HCM operations method of analysis, level of service for signalized intersections and approaches is defined in terms of control delay, which is a measure of the increase in travel time due to traffic signal control, driver discomfort, and fuel consumption. Control delay includes the delay associated with vehicles slowing in advance of an intersection, the time spent stopped on an intersection approach, the time spent as vehicles move up in the queue, and the time needed for vehicles to accelerate to their desired speed. LOS criteria for traffic signals are stated in terms of the control delay in seconds per vehicle. The LOS thresholds established for the automobile mode at a signalized intersection are shown in ***Table 3-2***.

### 3.5.3 *Highway Capacity Manual (HCM) Method of Analysis (Unsignalized Intersections)*

The HCM unsignalized methodology for stop-controlled intersections was utilized for the analysis of the unsignalized intersections. LOS criteria for unsignalized intersections differ from LOS criteria for signalized intersections as signalized intersections are designed for heavier traffic and therefore a greater delay. Unsignalized intersections are also associated with more uncertainty for users, as delays are less predictable, which can reduce users' delay tolerance.

Two-way stop-controlled intersections are comprised of a major street, which is uncontrolled, and a minor street, which is controlled by stop signs. Level of service for a two-way stop-controlled intersection is determined by the computed or measured control delay. The control delay by movement, by approach, and for the intersection as a whole is estimated by the computed capacity for each movement. LOS is determined for each minor-street movement (or shared movement) as well as major-street left turns. The worst side street approach delay is reported. LOS is not defined for the intersection as a whole or for major-street approaches, as it is assumed that major-street through vehicles experience zero delay. The HCM control delay value range for two-way stop-controlled intersections is shown in ***Table 3-3***.

## 3.6 Level of Service Criteria

According to City of Brea and City of Fullerton, LOS D is the minimum acceptable condition that should be maintained during the morning and evening peak commute hours at intersections.

The City of La Habra has also established LOS D as its criterion for an acceptable level of service at City jurisdiction intersections. For intersections located along a Congestion Management Plan (CMP) network, LOS E is considered acceptable within the City of La Habra. However, LOS D is considered to be the acceptable level of service at all La Habra locations in order to be conservative.

Caltrans "endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on State highway facilities"; it does not require that LOS "D" (shall) be maintained. However, Caltrans

acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. Caltrans has determined that all state owned facilities that operate below LOS D should be identified and improved to an acceptable LOS. The *Caltrans Traffic Impact Study Guidelines dated December 2002* does state that if an existing state owned facility operates at less than LOS D, the existing service level should be maintained. At locations within the City of Brea but under the jurisdiction of Caltrans (i.e. study locations located along Imperial (SR-90) Highway), inclusive of the ramp intersections at the SR-57 Freeway/Lambert Road Interchange and SR-57 Freeway/Imperial Highway Interchange, Caltrans LOS standards would apply. Based on the above, LOS D is the acceptable condition that should be maintained for all key study intersections during the morning and evening peak commute hours with the exception of those within the City of La Habra where LOS E is defined in the CMP for Orange County as the acceptable limit.

**TABLE 3-1**

**LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS (ICU METHODOLOGY)**

| Level of Service (LOS) | Intersection Capacity Utilization Value (V/C) | Level of Service Description |
|---|---|---|
| A | ≤ 0.600 | EXCELLENT. No vehicle waits longer than one red light, and no approach phase is fully used. |
| B | 0.601 – 0.700 | VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles. |
| C | 0.701 – 0.800 | GOOD. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles. |
| D | 0.801 – 0.900 | FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups. |
| E | 0.901 – 1.000 | POOR. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles. |
| F | > 1.000 | FAILURE. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Potentially very long delays with continuously increasing queue lengths. |

## TABLE 3-2

## LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS (HCM METHODOLOGY)[4]

| Control Delay (sec/veh) | Level of Service (LOS) | Level of Service Description |
|---|---|---|
| ≤ 10 | A | This level of service occurs when the v/c ratio is low and either progression is exceptionally favorable or the cycle length is very short. |
| > 10-20 | B | This level generally occurs when the v/c ratio is low and either progression is highly favorable or the cycle length is short. |
| > 20-35 | C | Average traffic delays. These higher delays may result when progression is favorable or the cycle length is moderate. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping. |
| > 35-55 | D | Long traffic delays. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high *v/c* ratios. Many vehicles stop and individual cycle failures are noticeable. |
| > 55-80 | E | Very long traffic delays. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high *v/c* ratios. Individual cycle failures are frequent. |
| > 80 | F | Severe congestion. This level, considered to be unacceptable to most drivers, often occurs with over saturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high *v/c* ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such delay levels. |

[4] Source: *Highway Capacity Manual*, Chapter 18: Signalized Intersections.

**TABLE 3-3**

**LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS (HCM METHODOLOGY)[5]**

| Control Delay (sec/veh) | Level of Service (LOS) | Level of Service Description |
|---|---|---|
| 0-10 | A | Little or no delay |
| > 10-15 | B | Short traffic delays |
| > 15-20 | C | Average traffic delays |
| > 25-35 | D | Long traffic delays |
| > 35-50 | E | Very long traffic delays |
| > 50 | F | Severe congestion |

[5] Source: *Highway Capacity Manual*, Chapter 19: Two-Way Stop-Controlled Intersections. The LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole.

## 3.7 Existing Level of Service Results

### 3.7.1 *Existing Conditions Intersection Capacity Analysis (ICU Methodology)*

***Table 3-4*** summarizes the existing Weekday AM, Weekday PM, and Weekend (Saturday) Midday peak hour service level calculations for the eighteen (18) key study intersections evaluated under ICU analysis based on existing traffic volumes and current street geometrics. Review of *Table 3-4* indicates that the intersection of State College Boulevard at Imperial Highway currently operates at unacceptable LOS during the Weekend (Saturday) Midday peak hour. The remaining seventeen (17) key study intersections currently operate an acceptable service levels during the Weekday AM, Weekday PM, and Weekend (Saturday) Midday peak hours.

***Appendix C*** presents the ICU LOS calculation worksheets for the eighteen (18) key study intersections for the Weekday AM peak hour, Weekday PM peak hour, and Weekend (Saturday) Midday peak hours.

### 3.7.2 *Existing Conditions Intersection Capacity Analysis (HCM Methodology)*

***Table 3-4*** summarize the existing peak hour service level calculations for the eighteen (18) key study intersections evaluated during the Weekday AM, Weekday PM, and Weekend (Saturday) Midday peak hours based on existing traffic volumes and current street geometrics based on the HCM Method of Analysis. Review of *Table 3-4* indicates that the intersection of State College Boulevard at Imperial Highway currently operates an unacceptable LOS during the Weekday PM and Weekend (Saturday) Midday peak hours. The remaining seventeen (17) key study intersections currently operate an acceptable service levels during the Weekday AM, Weekday PM, and Weekend (Saturday) Midday peak hours.

***Appendix D*** presents the HCM LOS calculation worksheets for the eight (18) key study intersections for the Weekday AM peak hour, Weekday PM peak hour, and Weekend (Saturday) Midday peak hours.

## TABLE 3-4
## EXISTING PEAK HOUR INTERSECTION CAPACITY ANALYSIS - ICU

| Study Intersection | Jurisdiction | Minimum Acceptable LOS | Control Type | Time Period | ICU | LOS |
|---|---|---|---|---|---|---|
| 1. State College Boulevard at Lambert Road | Brea | D | 8∅ Traffic Signal | AM | 0.703 | C |
| | | | | PM | 0.676 | B |
| | | | | Sat MD | 0.679 | B |
| 2. SR-57 SB Ramps at Lambert Road | Brea/ Caltrans | D | 3∅ Traffic Signal | AM | 0.749 | C |
| | | | | PM | 0.614 | B |
| | | | | Sat MD | 0.730 | C |
| 3. SR-57 NB Ramps at Lambert Road | Brea/ Caltrans | D | 3∅ Traffic Signal | AM | 0.820 | D |
| | | | | PM | 0.568 | A |
| | | | | Sat MD | 0.686 | B |
| 4. Randolph Avenue at Birch Street | Brea | D | 5∅ Traffic Signal | AM | 0.352 | A |
| | | | | PM | 0.566 | A |
| | | | | Sat MD | 0.468 | A |
| 5. State College Boulevard at Birch Street[6] | Brea | D | 8∅ Traffic Signal | AM | 0.529 | A |
| | | | | PM | 0.673 | B |
| | | | | Sat MD | 0.633 | B |
| 6. S Associated Road at Birch Street | Brea | D | 6∅ Traffic Signal | AM | 0.619 | B |
| | | | | PM | 0.619 | B |
| | | | | Sat MD | 0.514 | A |
| 7. Randolph Avenue at Madison Way | Brea | D | 5∅ Traffic Signal | AM | 0.139 | A |
| | | | | PM | 0.243 | A |
| | | | | Sat MD | 0.291 | A |
| 8. Randolph Avenue at Brea Mall | Brea | D | 6∅ Traffic Signal | AM | 0.136 | A |
| | | | | PM | 0.358 | A |
| | | | | Sat MD | 0.449 | A |
| 9. Brea Mall South at State College Boulevard | Brea | D | 6∅ Traffic Signal | AM | 0.183 | A |
| | | | | PM | 0.442 | A |
| | | | | Sat MD | 0.588 | A |
| 10. Harbor Boulevard at Imperial Highway | La Habra/ Fullerton/ Caltrans | D[7] | 8∅ Traffic Signal | AM | 0.790 | C |
| | | | | PM | 0.770 | C |
| | | | | Sat MD | 0.681 | B |

[6] It should be noted the southbound approach at the intersection has recently been widened to accommodate an exclusive right-turn lane. The level of service analysis presented in this report does not include this recent improvement, however, it is anticipated that the intersection would continue to operate at similar, if not better, service levels as presented herein with the inclusion of the southbound right-turn lane.

[7] According to City of La Habra guidelines, LOS E is acceptable at this location but is shown as LOS D to be conservative.

## TABLE 3-4 (CONTINUED)
## EXISTING PEAK HOUR INTERSECTION CAPACITY ANALYSIS - ICU

| Study Intersection | Jurisdiction | Minimum Acceptable LOS | Control Type | Time Period | ICU | LOS |
|---|---|---|---|---|---|---|
| 11. Puente Street at Imperial Highway | Brea/ Fullerton/ Caltrans | D | 5∅ Traffic Signal | AM | 0.573 | A |
| | | | | PM | 0.589 | A |
| | | | | Sat MD | 0.477 | A |
| 12. Brea Boulevard at Imperial Highway | Brea/ Caltrans | D | 8∅ Traffic Signal | AM | 0.787 | C |
| | | | | PM | 0.773 | C |
| | | | | Sat MD | 0.779 | C |
| 13. Randolph Avenue at Imperial Highway | Brea/ Caltrans | D | 6∅ Traffic Signal | AM | 0.420 | A |
| | | | | PM | 0.647 | B |
| | | | | Sat MD | 0.720 | C |
| 14. State College Boulevard at Imperial Highway | Brea/ Caltrans | D | 8∅ Traffic Signal | AM | 0.701 | C |
| | | | | PM | 0.862 | D |
| | | | | Sat MD | **1.092** | **F** |
| 15. SR-57 SB Ramps at Imperial Highway | Brea/ Caltrans | D | 2∅ Traffic Signal | AM | 0.575 | A |
| | | | | PM | 0.705 | C |
| | | | | Sat MD | 0.779 | C |
| 16. SR-57 NB Ramps at Imperial Highway | Brea/ Caltrans | D | 4∅ Traffic Signal | AM | 0.570 | A |
| | | | | PM | 0.712 | C |
| | | | | Sat MD | 0.831 | D |
| 17. Associated Road at Imperial Highway | Brea/ Caltrans | D | 8∅ Traffic Signal | AM | 0.704 | C |
| | | | | PM | 0.780 | C |
| | | | | Sat MD | 0.713 | C |
| 18. Castlegate Lane/Placentia Avenue at Imperial Highway | Brea/ Caltrans | D | 6∅ Traffic Signal | AM | 0.601 | B |
| | | | | PM | 0.699 | B |
| | | | | Sat MD | 0.675 | B |

Notes:

- **Bold ICU/LOS** values indicate adverse service levels based on the City LOS standards.

## TABLE 3-5
## EXISTING PEAK HOUR INTERSECTION CAPACITY ANALYSIS - HCM

| | Study Intersection | Jurisdiction | Minimum Acceptable LOS | Control Type | Time Period | Delay (s/v) | LOS |
|---|---|---|---|---|---|---|---|
| 1. | State College Boulevard at Lambert Road | Brea | D | 8∅ Traffic Signal | AM | 34.0 | C |
| | | | | | PM | 36.3 | D |
| | | | | | Sat MD | 35.7 | D |
| 2. | SR-57 SB Ramps at Lambert Road | Brea/ Caltrans | D | 3∅ Traffic Signal | AM | 27.1 | C |
| | | | | | PM | 19.5 | B |
| | | | | | Sat MD | 25.1 | C |
| 3. | SR-57 NB Ramps at Lambert Road | Brea/ Caltrans | D | 3∅ Traffic Signal | AM | 28.0 | C |
| | | | | | PM | 19.9 | B |
| | | | | | Sat MD | 24.9 | C |
| 4. | Randolph Avenue at Birch Street | Brea | D | 5∅ Traffic Signal | AM | 14.2 | B |
| | | | | | PM | 30.1 | C |
| | | | | | Sat MD | 20.0 | C |
| 5. | State College Boulevard at Birch Street[8] | Brea | D | 8∅ Traffic Signal | AM | 37.6 | D |
| | | | | | PM | 30.6 | C |
| | | | | | Sat MD | 37.3 | D |
| 6. | S Associated Road at Birch Street | Brea | D | 6∅ Traffic Signal | AM | 26.1 | C |
| | | | | | PM | 25.6 | C |
| | | | | | Sat MD | 22.3 | C |
| 7. | Randolph Avenue at Madison Way | Brea | D | 5∅ Traffic Signal | AM | 17.3 | B |
| | | | | | PM | 19.0 | B |
| | | | | | Sat MD | 20.5 | C |
| 8. | Randolph Avenue at Brea Mall | Brea | D | 6∅ Traffic Signal | AM | 8.2 | A |
| | | | | | PM | 18.3 | B |
| | | | | | Sat MD | 22.7 | C |
| 9. | Brea Mall South at State College Boulevard | Brea | D | 6∅ Traffic Signal | AM | 15.6 | B |
| | | | | | PM | 30.7 | C |
| | | | | | Sat MD | 32.8 | C |
| 10. | Harbor Boulevard at Imperial Highway | La Habra/ Fullerton/ Caltrans | D[9] | 8∅ Traffic Signal | AM | 40.4 | D |
| | | | | | PM | 41.7 | D |
| | | | | | Sat MD | 38.7 | D |

[8] It should be noted the southbound approach at the intersection has recently been widened to accommodate an exclusive right-turn lane. The level of service analysis presented in this report does not include this recent improvement, however, it is anticipated that the intersection would continue to operate at similar, if not better, service levels as presented herein with the inclusion of the southbound right-turn lane.

[9] According to City of La Habra guidelines, LOS E is acceptable at this location but is shown as LOS D to be conservative.

## TABLE 3-5 (CONTINUED)
## EXISTING PEAK HOUR INTERSECTION CAPACITY ANALYSIS - HCM

| Study Intersection | Jurisdiction | Minimum Acceptable LOS | Control Type | Time Period | Delay (s/v) | LOS |
|---|---|---|---|---|---|---|
| 11. Puente Street at Imperial Highway | Brea/ Fullerton/ Caltrans | D | 5∅ Traffic Signal | AM | 18.1 | B |
| | | | | PM | 18.5 | B |
| | | | | Sat MD | 13.0 | B |
| 12. Brea Boulevard at Imperial Highway | Brea/ Caltrans | D | 8∅ Traffic Signal | AM | 40.2 | D |
| | | | | PM | 37.5 | D |
| | | | | Sat MD | 40.3 | D |
| 13. Randolph Avenue at Imperial Highway | Brea/ Caltrans | D | 6∅ Traffic Signal | AM | 12.4 | B |
| | | | | PM | 23.4 | C |
| | | | | Sat MD | 36.2 | D |
| 14. State College Boulevard at Imperial Highway | Brea/ Caltrans | D | 8∅ Traffic Signal | AM | 30.4 | C |
| | | | | PM | **56.0** | **E** |
| | | | | Sat MD | **112.0** | **F** |
| 15. SR-57 SB Ramps at Imperial Highway | Brea/ Caltrans | D | 2∅ Traffic Signal | AM | 15.3 | B |
| | | | | PM | 15.9 | B |
| | | | | Sat MD | 17.5 | B |
| 16. SR-57 NB Ramps at Imperial Highway | Brea/ Caltrans | D | 4∅ Traffic Signal | AM | 21.2 | C |
| | | | | PM | 22.5 | C |
| | | | | Sat MD | 36.5 | D |
| 17. Associated Road at Imperial Highway | Brea/ Caltrans | D | 8∅ Traffic Signal | AM | 27.2 | C |
| | | | | PM | 40.7 | D |
| | | | | Sat MD | 34.5 | C |
| 18. Castlegate Lane/Placentia Avenue at Imperial Highway | Brea/ Caltrans | D | 6∅ Traffic Signal | AM | 18.1 | B |
| | | | | PM | 24.0 | C |
| | | | | Sat MD | 20.8 | C |

Notes:

- **Bold HCM/LOS** values indicate adverse service levels based on the City LOS standards.
- s/v = seconds per vehicle (delay)

# 4.0 TRAFFIC FORECASTING METHODOLOGY

In order to estimate the traffic characteristics of the proposed Project, a multi-step process has been utilized. The first step is traffic generation, which estimates the total arriving and departing traffic on a peak hour and daily basis. The traffic generation potential is forecast by applying the appropriate vehicle trip generation equations or rates to the project development tabulation.

The second step of the forecasting process is traffic distribution, which identifies the origins and destinations of inbound and outbound project traffic. These origins and destinations are typically based on demographics and existing/expected future travel patterns in the study area.

The third step is traffic assignment, which involves the allocation of project traffic to study area streets and intersections. Traffic assignment is typically based on minimization of travel time, which may or may not involve the shortest route, depending on prevailing operating conditions and travel speeds. Traffic distribution patterns are indicated by general percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway links and intersection turning movements throughout the study area.

With the forecasting process complete and project traffic assignments developed, the proposed project is isolated by comparing operational (LOS) conditions at selected study intersections using expected future traffic volumes with and without forecast project traffic. The need for site-specific and/or cumulative local area traffic improvements can then be evaluated.

# 5.0 PROJECT TRAFFIC CHARACTERISTICS

## 5.1 Project Traffic Generation

Traffic generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Generation equations and/or rates used in the traffic forecasting procedure are found in the 10th Edition of *Trip Generation*, published by the Institute of Transportation Engineers (ITE) [Washington D.C., 2017] and empirical trip generation rates developed from studies of existing Lifetime Fitness facilities.

***Table 5-1*** summarizes the trip generation rates used in forecasting the vehicular trips generated by the proposed Project and also presents the project's forecast peak hour and daily traffic volumes. As shown in the upper portion of *Table 5-1,* ITE Land Use 221: Multifamily Housing (Mid-Rise) trip rates and ITE Land Use 820: Shopping Center equations, and empirical rates from existing Lifetime Fitness facilities will be used to forecast the trip generation potential of a fully occupied existing Brea Mall and site, as well as the Project.

It should be noted that traffic patterns near Malls vary by time of year (i.e. holiday seasons). However, standard engineering practice consist of forecasting trips during a "typical" weekday and "typical" Saturday periods (non-holiday season). Therefore, this standard practice has been applied in this report. It is very common for large shopping centers to have parking management plans in place to manage peak seasonal demands that are specific to its needs. It is anticipated that the current practices of the Brea Mall as it relates to seasonal peaks will continue to apply and/or be adjusted accordingly.

A review of the middle portion of *Table 5-1* indicates that a fully occupied Brea Mall (including the currently vacant second story of Sears) (Row B) is forecast to generate approximately 30,817 Weekday daily trips, with 757 trips (469 inbound, 288 outbound) produced in the Weekday AM peak hour and 3,247 trips (1,559 inbound, 1,688 outbound) produced in the Weekday PM peak hour on a "typical" weekday. A fully occupied Brea Mall is forecast to generate 39,183 Saturday daily trips, with 4,204 trips (2,186 inbound, 2,018 outbound) produced in the Saturday Midday peak hour on a "typical" Saturday.

The lower portion of *Table 5-1* presents the trip generation associated with the existing occupied Brea Mall and the additional proposed Project uses (Row C). A review of lower portion of this table indicates that the proposed Project with the existing Brea Mall is forecast to generate approximately 33,976 Weekday daily trips, with 1,067 trips (622 inbound, 445 outbound) produced in the Weekday AM peak hour and 3,556 trips (1,789 inbound, 1,767 outbound) produced in the Weekday PM peak hour on a "typical" weekday. The proposed Project with the existing Brea Mall is forecast to generate 42,060 Saturday daily trips, with 4,484 trips (2,274 inbound, 2,210 outbound) produced in the Saturday Midday peak hour on a "typical" Saturday.

When the proposed Project is compared to an existing fully occupied Brea Mall site, the proposed Project is forecast to generate 3,159 more Weekday daily trips, 310 more Weekday AM peak hour trips, 309 more Weekday PM peak hour trips, 2,877 more Saturday daily trips, and 280 more

Saturday Midday peak hour trips. The potential implications of these added Project trips to the local area roadway network has been evaluated in this traffic analysis.

## 5.2 Project Traffic Distribution and Assignment

***Figures 5-1*** and ***5-2*** presents the Project Trip Distribution for the commercial and residential components, respectively. The Project Trip Distribution for the retail and residential components have been distributed and assigned to the adjacent street system based on Project Select Zone model runs and have been further refined based on the following considerations:

- Recognition that the Brea Mall draws traffic from the surrounding region, and is not just a local area attraction.
- location of site access points in relation to the surrounding street system,
- the site's immediate proximity to major traffic carriers and regional access routes, such as the SR-57 Freeway and SR-90 (Imperial Highway),
- physical characteristics of the circulation system such as lane channelization and presence of traffic signals that affect travel patterns,
- presence of traffic congestion in the surrounding vicinity,
- ingress/egress availability at the project site, and
- input by City Staff.

It should be noted that Project traffic has been distributed to the Brea Mall's existing site access intersections of Randolph Avenue at Brea Mall and Brea Mall South at State College Boulevard due to the location of the proposed Project in the southwest portion of the Brea Mall site. From a review of *Figure 5-1,* approximately 36% and 64% of the Project's new commercial traffic is forecast to utilize Randolph Avenue at Brea Mall and Brea Mall South at State College Boulevard, respectively, As shown in *Figure 5-2,* approximately 83% and 17% of the Project's residential traffic utilize Randolph Avenue at Brea Mall and Brea Mall South at State College Boulevard, respectively,

The anticipated weekday AM and PM peak hour and weekend (Saturday) midday peak hour project traffic volumes associated with the proposed Project are presented in ***Figures 5-3, 5-4*** and ***5-5***, respectively. *Figures 5-4* and *5-5* also present the weekday and weekend daily Project traffic volumes, respectively. The traffic volume assignments presented in *Figures 5-3, 5-4* and *5-5* reflect the traffic distribution characteristics shown in *Figures 5-1* and *5-2* and the traffic generation forecast presented in *Table 5-1.*

## TABLE 5-1

## PROJECT TRAFFIC GENERATION RATES AND FORECAST[10]

| ITE Land Use Code/ Project Description | Weekday | | | | | | | Saturday | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily | AM Peak Hour | | | PM Peak Hour | | | Daily | MD Peak Hour | | |
| | 2-Way | Enter | Exit | Total | Enter | Exit | Total | 2-Way | Enter | Exit | Total |
| ***Trip Generation Factors:*** | | | | | | | | | | | |
| • 221: Multifamily Housing (Mid-Rise) (TE/DU) [11] | 5.44 | 26% | 74% | 0.36 | 61% | 39% | 0.44 | 4.91 | 49% | 51% | 0.44 |
| • 820: Shopping Center (TE/TSF GLA) | Eq. [12] | 62% | 38% | Eq.[12] | 48% | 52% | Eq. [12] | Eq. [12] | 52% | 48% | Eq. [12] |
| • Health Club (TE/TSF) [13] | 27.44 | 1.02 | 0.51 | 1.53 | 1.85 | 0.97 | 2.83 | 26.35 | 1.04 | 1.79 | 2.83 |
| ***[A] Existing Occupied Brea Mall:*** | | | | | | | | | | | |
| • Existing Shopping Center (1,210,438 SF) | 32,766 | 469 | 288 | 757 | 1,651 | 1,788 | 3,439 | 41,824 | 2,308 | 2,130 | 4,438 |
| Pass-by Reduction[14] | -3,277 | -23 | -15 | -38 | -165 | -179 | -344 | -4,182 | -231 | -213 | -444 |
| ***Existing Occupied Brea Mall Subtotal*** | ***29,489*** | ***446*** | ***273*** | ***719*** | ***1,486*** | ***1,609*** | ***3,095*** | ***37,642*** | ***2,077*** | ***1,917*** | ***3,994*** |
| ***[B] Existing Occupied Brea Mall + Vacancy:*** | | | | | | | | | | | |
| • Fully Occupied Shopping Center (1,291,433 SF)[15] | 34,241 | 494 | 303 | 797 | 1,732 | 1,876 | 3,608 | 43,537 | 2,429 | 2,242 | 4,671 |
| Pass-by Reduction[14] | -3,424 | -25 | -15 | -40 | -173 | -188 | -361 | -4,354 | -243 | -224 | -467 |
| ***Fully Occupied Brea Mall Total*** | ***30,817*** | ***469*** | ***288*** | ***757*** | ***1,559*** | ***1,688*** | ***3,247*** | ***39,183*** | ***2,186*** | ***2,018*** | ***4,204*** |
| ***[C] Existing Occupied Brea Mall + Proposed Project:*** | | | | | | | | | | | |
| • Proposed Shopping Center (1,248,858 SF)[16] | 33,469 | 481 | 295 | 776 | 1,690 | 1,830 | 3,520 | 42,642 | 2,365 | 2,184 | 4,549 |
| Internal Capture[17] | -917 | -1 | -1 | -2 | -28 | -47 | -75 | -827 | -36 | -38 | -74 |
| *Proposed Shopping Center Subtotal* | *32,552* | *480* | *294* | *774* | *1,662* | *1,783* | *3,445* | *41,815* | *2,329* | *2,146* | *4,475* |
| Pass-by Reduction[14] | -3,255 | -24 | -15 | -39 | -166 | -179 | -345 | -4,182 | -233 | -215 | -448 |
| *Proposed Shopping Center Subtotal* | *29,297* | *456* | *279* | *735* | *1,496* | *1,604* | *3,100* | *37,633* | *2,096* | *1,931* | *4,027* |
| • Proposed Health Club (128,000 SF) | 3,512 | 131 | 65 | 196 | 237 | 125 | 362 | 3,373 | 133 | 229 | 362 |
| • Proposed Residential (383 DU) | 2,084 | 36 | 102 | 138 | 103 | 66 | 169 | 1,881 | 83 | 86 | 169 |
| Internal Capture[17] | -917 | -1 | -1 | -2 | -47 | -28 | -75 | -827 | -38 | -36 | -74 |
| *Proposed Residential Subtotal* | *1,167* | *35* | *101* | *136* | *56* | *38* | *94* | *1,054* | *45* | *50* | *95* |
| ***[C] Existing Occupied Brea Mall + Proposed Project Total*** | ***33,976*** | ***622*** | ***445*** | ***1,067*** | ***1,789*** | ***1,767*** | ***3,556*** | ***42,060*** | ***2,274*** | ***2,210*** | ***4,484*** |
| **[D] Net Trip Generation [C] (Existing Occupied Brea Mall + Proposed Project) – [B] (Existing Occupied Brea Mall + Vacancy)** | **3,159** | **153** | **157** | **310** | **230** | **79** | **309** | **2,877** | **88** | **192** | **280** |

**Notes:**
TE/DU = Trip End per Dwelling Unit
TE/TSF GLA = Trip End per Thousand Square Feet Gross Leasable Area
TE/TSF = Trip End per Thousand Square Feet

10 Source: *Trip Generation*, 10th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2017).

11 Mid-Rise Multifamily Housing consists of buildings that are between 3 and 10 levels.

12 Trip Generation rates based on the following equations:
- Weekday Daily: Ln(T) = 0.68Ln(X) + 5.57
- Weekday AM Peak Hour: T = 0.50(X) + 151.78
- Weekday PM Peak Hour: Ln(T) = 0.74Ln(X) + 2.89
- Saturday Daily: Ln(T) = 0.62Ln(X) + 6.24
- Saturday Peak Hour of Generator: Ln(T) = 0.79Ln(X) + 2.79

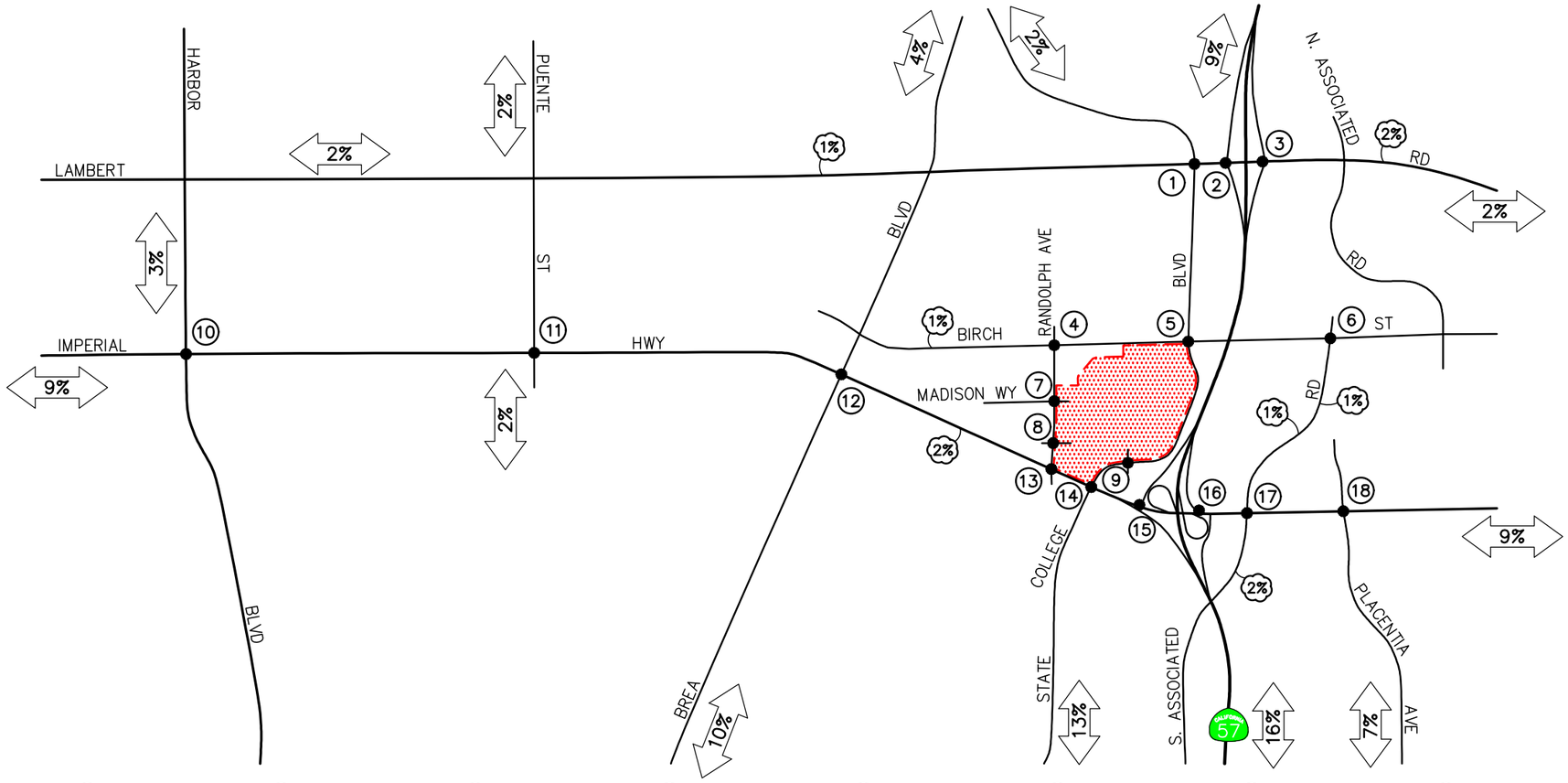
13 Source: *Northshore Mall Redevelopment Traffic Impact and Access Study,* prepared by vhb, dated April 2018. As there is no Sunday Daily and Sunday Midday peak hour empirical rates available, Saturday Daily and Saturday Midday peak hour empirical rates have been applied.

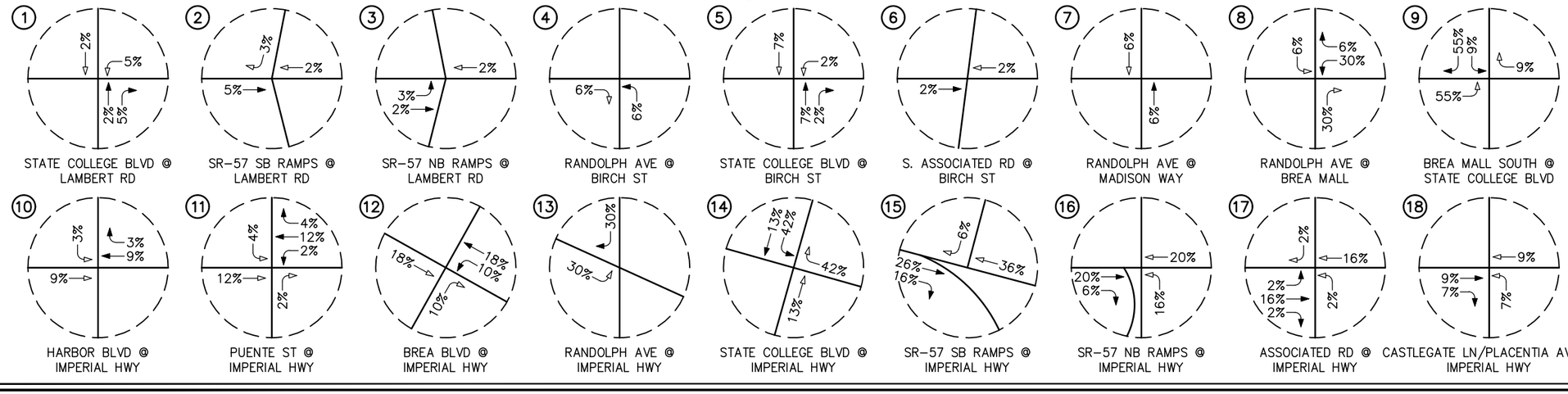
14 The pass-by trip reductions applied to retail trips are 10% for Weekday Daily, 5% for Weekday AM peak hour, 10% for Weekday PM peak hour, 10% for Saturday Daily, 10% for Saturday Midday peak hour, 10% for Sunday Daily, and 10% for Sunday Midday peak hour.

15 The fully occupied Brea Mall includes the existing 1,210,438 SF of occupied mall and 80,995 SF of second floor Sears vacancy.

16 The proposed Brea Mall includes the existing 1,210,438 SF of occupied mall, 80,995 SF of the occupied first floor of the Sears building to be demolished, and 119,415 SF of additional commercial.

17 Consistent with the *Trip Generation Handbook,* published by ITE (2017), Project trip generation was adjusted to account for internal capture between the retail and residential components of the Project. As there is no Saturday or Sunday internal capture worksheets available, Weekday Daily and Weekday PM peak hour calculations have been applied to Saturday Daily, Saturday Midday peak hour, Sunday Daily, and Sunday Midday peak hour.




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N NO SCALE

KEY

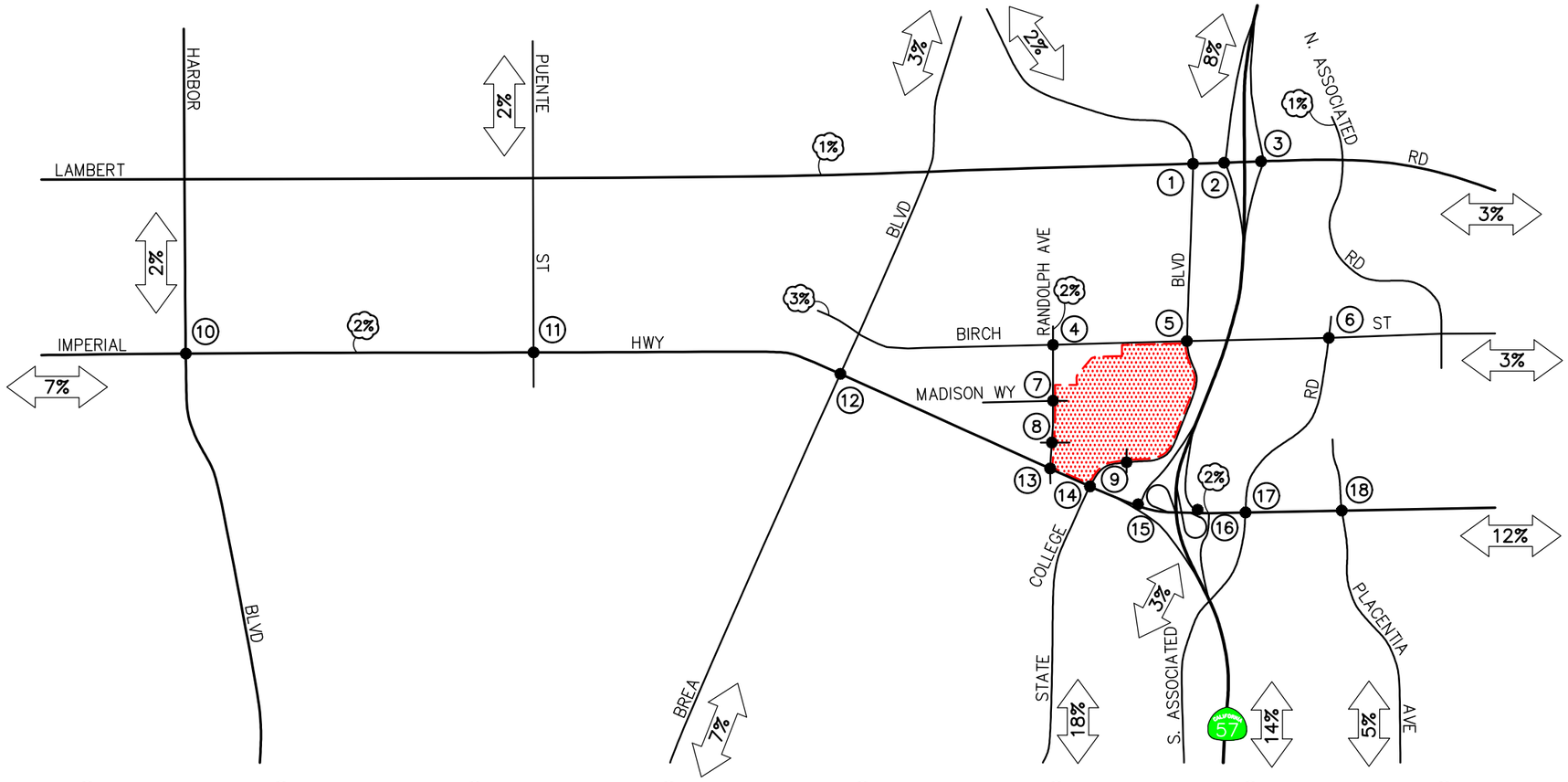
(#) = STUDY INTERSECTION
⇦ = INBOUND PERCENTAGE
⇦ = OUTBOUND PERCENTAGE
▭ = PROJECT SITE

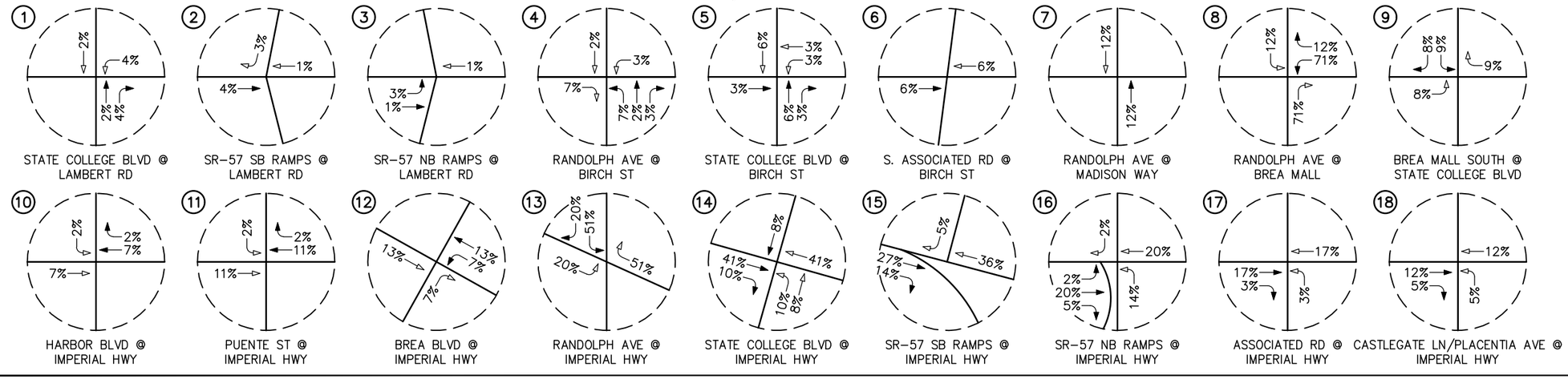
# FIGURE 5-1

## PROJECT TRIP DISTIBUTION – COMMERCIAL

BREA MALL MIXED-USE PROJECT, BREA

n:\4000\2194099 - brea mall expansion & improvement, brea\dwg\4099 f5-1a.dwg LDP 13:35:07 04-12-2022 kopulsky




LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION
= INBOUND PERCENTAGE
= OUTBOUND PERCENTAGE
= PROJECT SITE

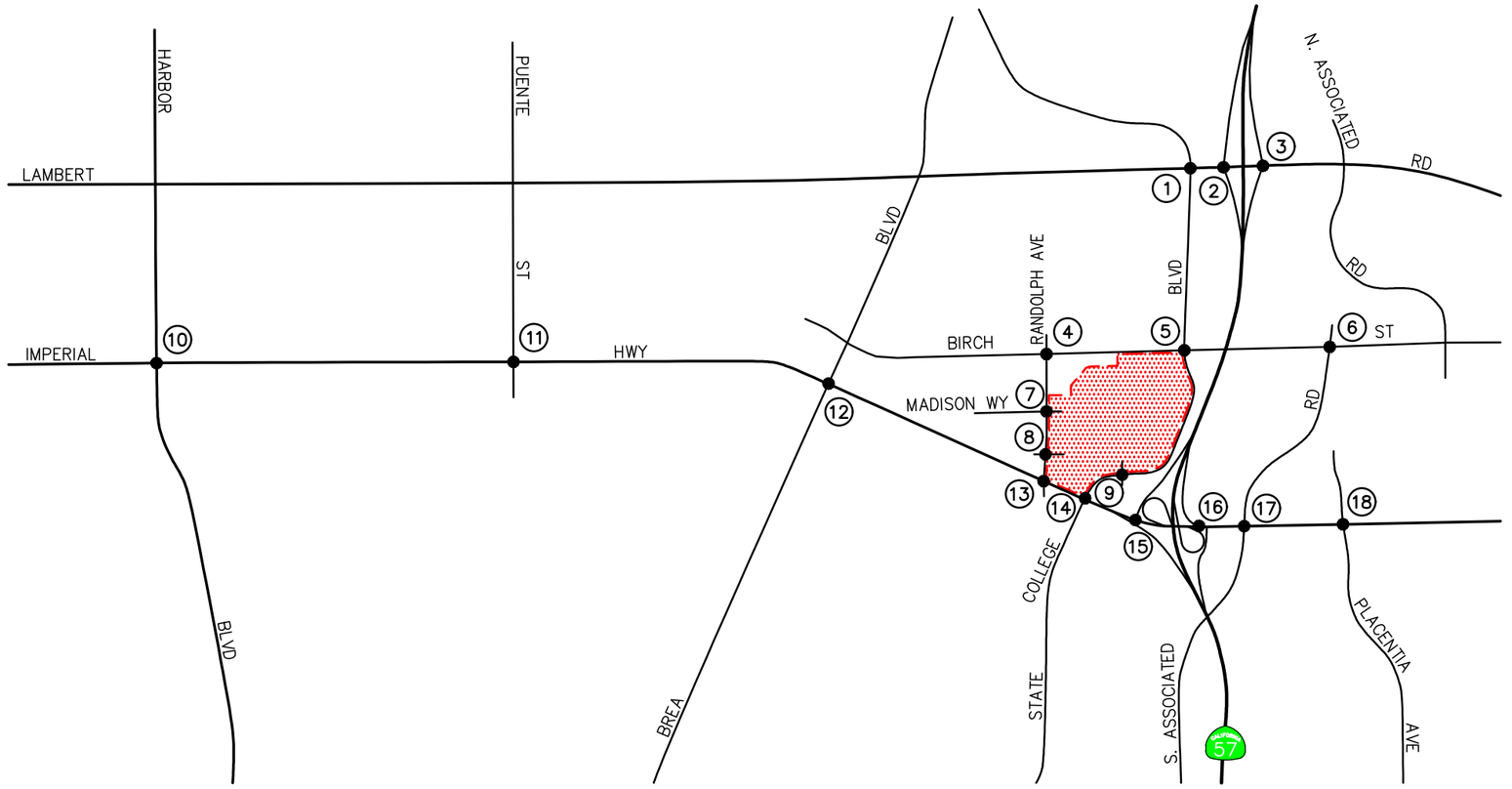
# FIGURE 5-2

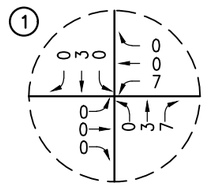
## PROJECT TRIP DISTIBUTION – RESIDENTIAL

BREA MALL MIXED-USE PROJECT, BREA

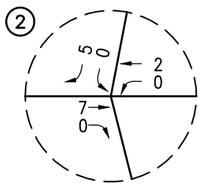


n:\4000\2194099 - brea mall expansion & improvement, brea\dwg\4099 f5-1a.dwg LDP 13:35:07 04-12-2022 kopulsky

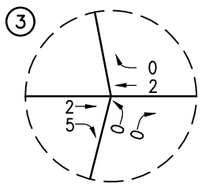


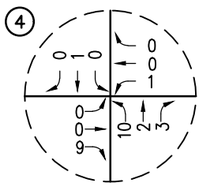

STATE COLLEGE BLVD @
LAMBERT RD



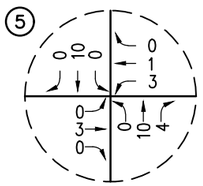

SR-57 SB RAMPS @
LAMBERT RD



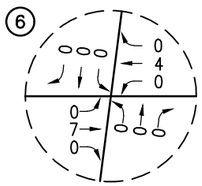

SR-57 NB RAMPS @
LAMBERT RD



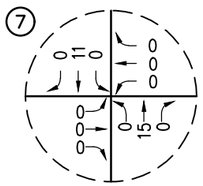

RANDOLPH AVE @
BIRCH ST



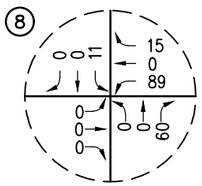

STATE COLLEGE BLVD @
BIRCH ST



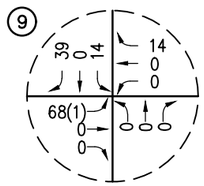

S. ASSOCIATED RD @
BIRCH ST



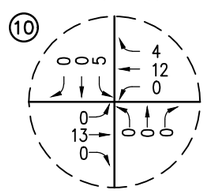

RANDOLPH AVE @
MADISON WAY



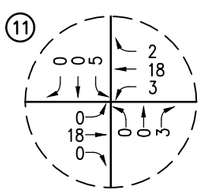

RANDOLPH AVE @
BREA MALL



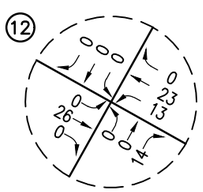

BREA MALL SOUTH @
STATE COLLEGE BLVD



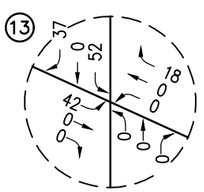

HARBOR BLVD @
IMPERIAL HWY



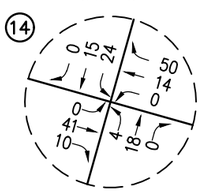

PUENTE ST @
IMPERIAL HWY



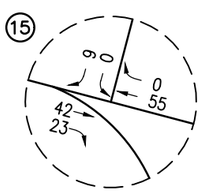

BREA BLVD @
IMPERIAL HWY



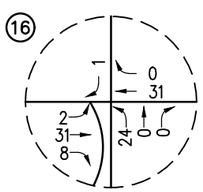

RANDOLPH AVE @
IMPERIAL HWY



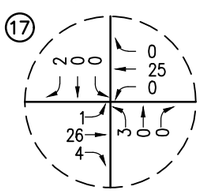

STATE COLLEGE BLVD @
IMPERIAL HWY



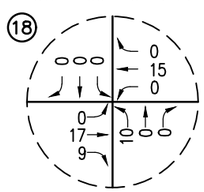

SR-57 SB RAMPS @
IMPERIAL HWY




SR-57 NB RAMPS @
IMPERIAL HWY




ASSOCIATED RD @
IMPERIAL HWY




CASTLEGATE LN/PLACENTIA AVE @
IMPERIAL HWY

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

= BREA MALL

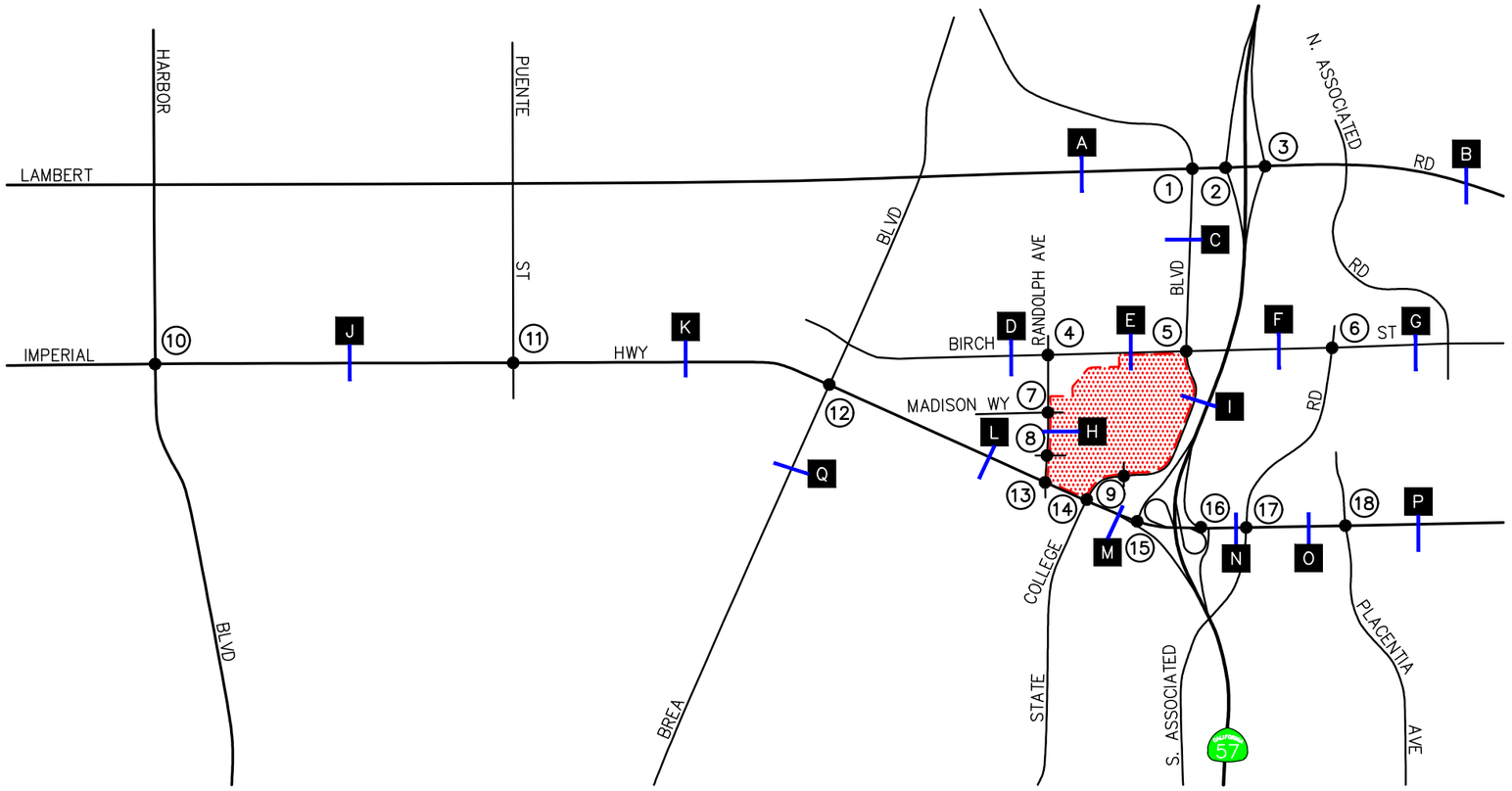
(XX) = PASSBY TRIPS

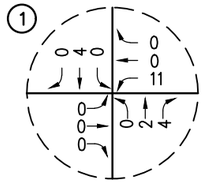
# FIGURE 5-3

## WEEKDAY AM PEAK HOUR PROJECT TRAFFIC VOLUMES

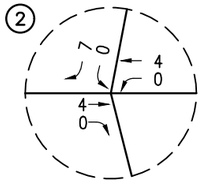
BREA MALL EXPANSION & IMPORVEMENTS, BREA

| LOCATION | VOLUME |
|---|---|
| A | *0* |
| B | *52* |
| C | *209* |
| D | *202* |
| E | *35* |
| F | *110* |
| G | *110* |
| H | *857* |
| I | *284* |
| J | *367* |
| K | *511* |
| L | *831* |
| M | *1,315* |
| N | *631* |
| O | *517* |
| P | *319* |
| Q | *281* |

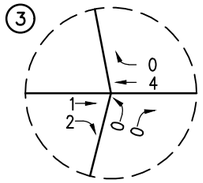


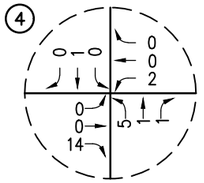
STATE COLLEGE BLVD @ LAMBERT RD



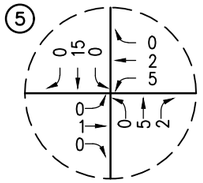
SR-57 SB RAMPS @ LAMBERT RD



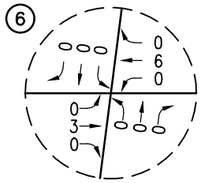
SR-57 NB RAMPS @ LAMBERT RD



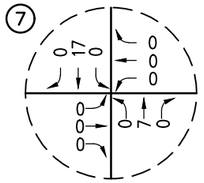
RANDOLPH AVE @ BIRCH ST



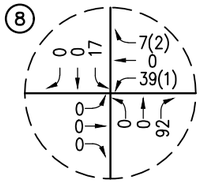
STATE COLLEGE BLVD @ BIRCH ST



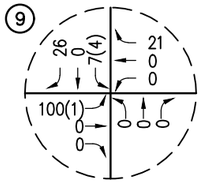
S. ASSOCIATED RD @ BIRCH ST



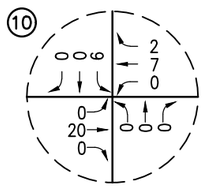
RANDOLPH AVE @ MADISON WAY



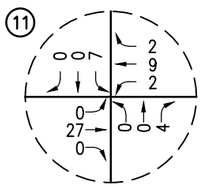
RANDOLPH AVE @ BREA MALL



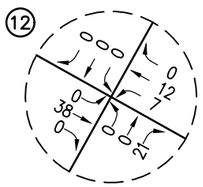
BREA MALL SOUTH @ STATE COLLEGE BLVD



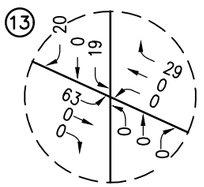
HARBOR BLVD @ IMPERIAL HWY



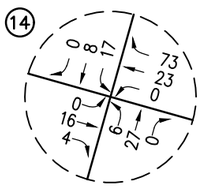
PUENTE ST @ IMPERIAL HWY



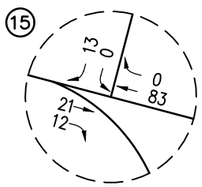
BREA BLVD @ IMPERIAL HWY



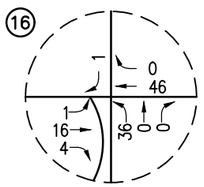
RANDOLPH AVE @ IMPERIAL HWY



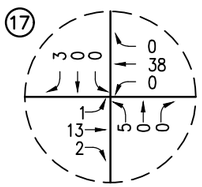
STATE COLLEGE BLVD @ IMPERIAL HWY



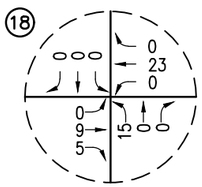
SR-57 SB RAMPS @ IMPERIAL HWY



SR-57 NB RAMPS @ IMPERIAL HWY



ASSOCIATED RD @ IMPERIAL HWY



CASTLEGATE LN/PLACENTIA AVE @ IMPERIAL HWY

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

# = STUDY ROADWAY SEGMENT

= BREA MALL

(XX) = PASSBY TRIPS

# FIGURE 5-4

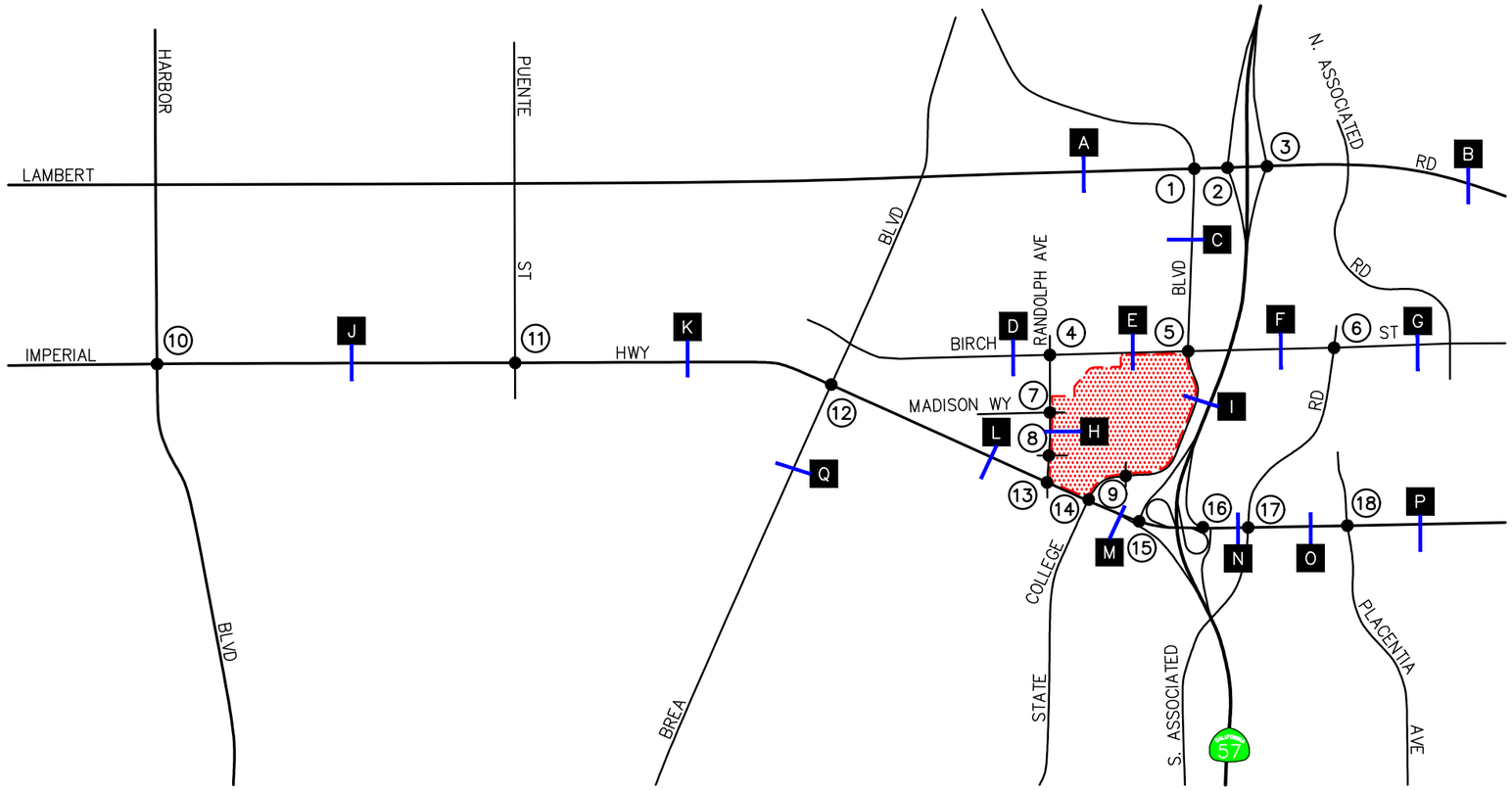
## WEEKDAY PM PEAK HOUR AND DAILY PROJECT TRAFFIC VOLUMES

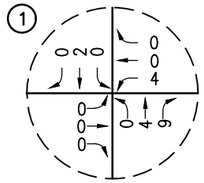
BREA MALL EXPANSION & IMPORVEMENTS, BREA



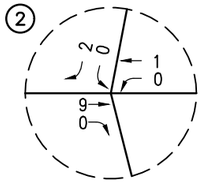
n:\4000\2194099 - brea mall expansion & improvement, brea\dwg\4099 prn base.dwg LDP 14:17:08 04-14-2022 kopulsky

| LOCATION | VOLUME |
|---|---|
| A | *0* |
| B | *47* |
| C | *191* |
| D | *183* |
| E | *32* |
| F | *99* |
| G | *99* |
| H | *782* |
| I | *259* |
| J | *335* |
| K | *465* |
| L | *758* |
| M | *1,198* |
| N | *576* |
| O | *471* |
| P | *290* |
| Q | *256* |

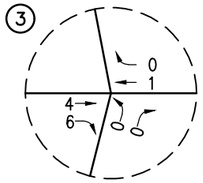


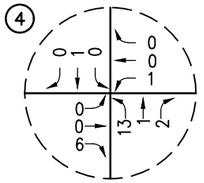
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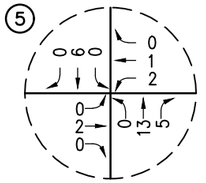
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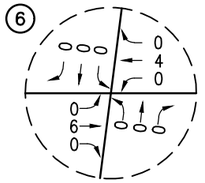
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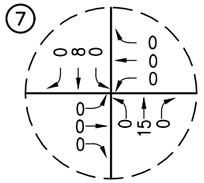
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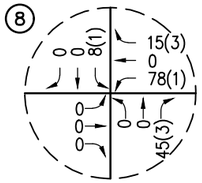
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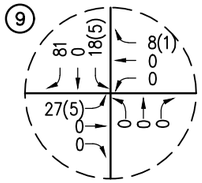
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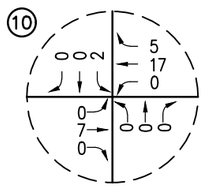
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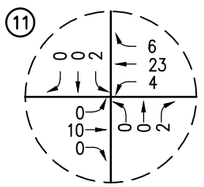
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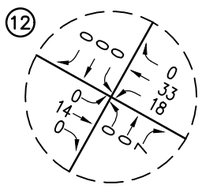
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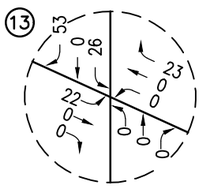
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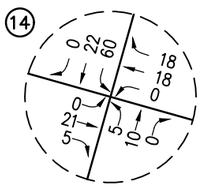
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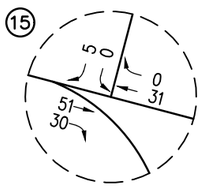
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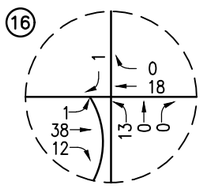
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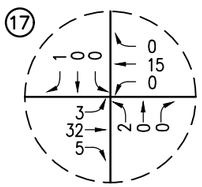
STATE COLLEGE BLVD @ IMPERIAL HWY



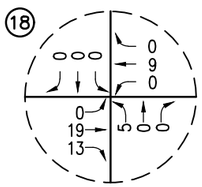
SR-57 SB RAMPS @ IMPERIAL HWY



SR-57 NB RAMPS @ IMPERIAL HWY



ASSOCIATED RD @ IMPERIAL HWY



CASTLEGATE LN/PLACENTIA AVE @ IMPERIAL HWY

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY
(#) = STUDY INTERSECTION
# = STUDY ROADWAY SEGMENT
= BREA MALL

# FIGURE 5-5

## WEEKEND (SATURDAY) MIDDAY PEAK HOUR AND DAILY PROJECT TRAFFIC VOLUMES

BREA MALL EXPANSION & IMPORVEMENTS, BREA

# 6.0 FUTURE TRAFFIC CONDITIONS

## 6.1 Ambient Traffic Growth

Horizon year, background traffic growth estimates have been calculated using an ambient traffic growth factor. The ambient traffic growth factor is intended to include unknown and future related projects in the study area, as well as account for regular growth in traffic volumes due to the development of projects outside the study area. The future growth in traffic volumes has been calculated at one percent (1.0%) per year. Applied to the Year 2022 existing baseline traffic conditions, this factor results in an 4.0% growth in existing volumes to the near-term year 2026.

## 6.2 Related Projects Traffic Characteristics

In order to make a realistic estimate of future on-street conditions prior to implementation of the proposed Project, the status of other known development projects (related projects) within the area of the proposed project has been researched at the City of Brea, City of Chino Hills, City of La Habra, and City of Fullerton. With this information, the potential implications of the proposed Project can be evaluated within the context of the cumulative setting of all ongoing development. Based on our research during the scoping process, there are twenty-three (23) related projects in the City of Brea, two (2) related projects in the City of Fullerton and seven (7) related projects in the City of Chino Hills that are being processed for approval. All of these related projects have been included as part of the cumulative background setting.

***Table 6-1*** provides a brief description for each of the thirty-two (32) related projects. ***Figure 6-1*** graphically illustrates the location of the thirty-two (32) related projects. These related projects are expected to generate vehicular traffic, which may affect the operating conditions of the key study intersections. In addition to the development projects noted in *Table 6-1*, roadway/interchange improvements associated with the SR-57 Lambert Interchange improvement project, now under construction, have been included in the Year 2026 and Year 2045 cumulative traffic conditions (See Section 11.0 for additional information).

***Table 6-2*** summarizes the trip generation potential for all thirty-two (32) related projects on a weekday daily and peak hour basis and on a weekend (Saturday) basis and midday peak hour. As shown, the related projects are expected to generate 38,681 weekday daily trips, with 2,992 trips (1,479 inbound, 1,513 outbound) anticipated during the weekday AM peak hour and 3,561 trips (1,786 inbound, 1,775 outbound) produced during the weekday PM peak hour. On a weekend (Saturday), the related projects are forecast to generate 38,164 weekend daily trips, with 3,909 trips (2,074 inbound, 1,835 outbound) anticipated during the weekend midday peak hour.

The weekday AM and PM peak hour traffic volumes associated with thirty-one (31) of the thirty-two (32) related projects in the Year 2026 are presented in ***Figures 6-2*** and ***6-3***, respectively, whereas the weekend (Saturday) midday peak hour traffic volumes are presented in ***Figure 6-4***. *Figures 6-3 and 6-4* also present the weekday and weekend daily related project traffic volumes. Per the direction of City staff the Brea 265 Specific Plan Project has been included as a related project as part of only Year 2045 background traffic conditions.

## TABLE 6-1

## LOCATION AND DESCRIPTION OF CUMULATIVE PROJECTS[18]

| No. | Description | Location/Address | Size |
|---|---|---|---|
| ***City of Brea*** | | | |
| 1. | CVS | 390 N. Brea Boulevard | 13,000 SF Pharmacy with Drive-Through, 1,700 SF Coffee Shop with Drive-through |
| 2. | Brea Place | State College Boulevard at Birch Street | 653 DU Apartments, 5,000 SF Office, 150 Room Hotel[19] |
| 3. | Downtown Hotel | 220 S. Brea Boulevard | 116 Room Hotel, 4,000 SF High Turnover Sit Down Restaurant |
| 4. | Mercury Apartments | Southeast corner of Berry Street at Mercury Lane | 120 DU Apartments |
| 5. | Brea 265 Specific Plan[20] | South of Lambert Road/Carbon Canyon Road, north of Rose Drive, east of Valencia Avenue and west of Carbon Canyon Regional Park | 1,100 residential units, consisting of 450 single-family homes and 650 multi-family residential units, and a 13-acre sports park |
| 6. | Brea Plaza | 409-477 S. Associated Road and 1555, 1609, 1623, 1643 E. Imperial Highway | Demolition of an existing 18,450 SF movie theater and the construction of a mixed-use development with 21,355 SF of office space and 229[21] apartment units |
| 7. | Central Park Village | 340-420 W. Central Avenue | 62 DU townhomes and 20 DU apartments[22] |
| 8. | New Industrial Building | 201 N. Berry Street | 109,125 SF warehouse |
| 9. | Alvero Assisted Living | 251 S. Randolph Avenue | 80 rooms with 82 beds residential care facility |
| 10. | Extra Space Self Storage | 2700 E. Imperial Highway | 126,546 self-storage facility |
| 11. | Brea Imperial Center | 391 S. State College Boulevard | 5,000 SF restaurant, 2,300 SF bagel/coffee shop, 1,600 SF café, 3,867 SF In-N-Out, 28,145 SF retail, and 4,400 SF bank to replace existing land uses which include 4,050 SF food uses, 24,481 SF retail, 4,400 SF bank, 2,325 SF medical office, 10,074 SF health studio spa. |
| 12. | Transwestern | 285 S. Berry Street and 711 W. Imperial Highway | 126,797 SF warehouse |
| 13. | The Phoenix Club | 375 W. Central Avenue | 8,350 SF restaurant with banquet hall |
| 14. | Aldi Grocery Store | 2395 E. Imperial Highway | 21,106 SF grocery store |
| 15. | Starbucks with Drive-Thru | 2 Pointe Drive | 2,400 SF coffee shop with drive-thru |
| 16. | Lambert Road Condos | 700-800 W. Lambert Road | 24 DU condominiums |

18 Source: City of Brea, Fullerton, and Chino Hills Planning Departments.

19 The traffic analysis conservatively evaluated 790 units as originally planned, which would result in higher traffic volumes in the cumulative scenarios.

20 Brea 265 Specific Plan Project has been included as a related project as part of Year 2045 background traffic conditions.

21 Fifteen (15) of the proposed apartments are considered co-living units, which include five (5) 3-bedroom units and ten (10) four-bedroom units, therefore, to provide a conservative assessment, the co-living unit bedrooms have been counted as individual units for a total apartment count of 229 units.

22 The project has already built and occupied 206 DU apartments and 83 DU townhomes.

## TABLE 6-1(CONTINUED)
## LOCATION AND DESCRIPTION OF CUMULATIVE PROJECTS[23]

| No. | Description | Location/Address | Size |
|---|---|---|---|
| ***City of Brea (Continued)*** | | | |
| 17. | Brea Metro Office Condos | 330 E. Lambert Road | 33 DU condominiums |
| 18. | Father's House | 245 W. Birch Street | 299 seat religious assembly |
| 19. | Cha Cha's Expansion | 110 W. Birch Street | Existing restaurant expansion of 2,710 SF |
| 20. | Western Realco | 2929 E. Imperial Highway | 131,500 SF industrial building |
| 21. | CAMP Transformation | 910 E. Birch Street, Suite 250 | 4,100 SF Fitness Center |
| 22. | Brea Express Wash | 300 S. Brea Boulevard | 4,254 SF express car wash |
| 23. | Raising Cane's | 255 E. Imperial Highway | Demolish existing 9,588 SF office building and construction of a 4,047 SF fast food restaurant with drive-through |
| ***City of Fullerton*** | | | |
| 24. | 3105 Yorba Linda Boulevard | 3105 Yorba Linda Boulevard | 4,840 SF drive-through car wash |
| 25. | Beckman Business Center | 4300 North Harbor Boulevard | 522,250 SF Warehousing, 166,185 SF General Light Industrial, 105,880 SF Manufacturing, 42,000 SF Office, and 142,350 SF fulfillment center |
| ***City of Chino Hills*** | | | |
| 26. | Woodbridge Pacific Group (Canyon Hills/Hillcrest) | Northwest of Carbon Canyon Road and west of Canyon Hills Road | 38 DU Single Family Detached |
| 27. | Stonefield Development | Northwest of Carbon Canyon Road and east of Fairway Drive | 28 DU single-family |
| 28. | Morningfield Estates and Loving Savior of the Hills Lutheran Church and School Master Plan Addendum | South of Morningfield Drive, west of Peyton Drive, north of Chino Hills Parkway, adjacent to San Bernardino County Flood Channel | 7-Lot Subdivision with semi-custom single-family homes, plus 3 classrooms/71 student addition to the Lutheran School |
| 29. | Coptic Orthodox Church | East side of Peyton Drive, north of the Chino Creek Drainage Channel and south of the Chino Valley Community Church property | 14,695 SF multi-purpose room, 8,645 SF Sanctuary and 555 SF Bookstore |
| 30. | Buddhist Temple of Chino Hills | Northeast of Chino Hills Parkway and Rustic Drive | 23,400 SF Buddhist temple expansion |
| 31. | Hidden Oaks | East of Carbon Canyon Road at Canyon Hills Road | 53 DU Single Family |
| 32. | Paradise Ranch | East of Canyon Hills Road and south of Esquilime Drive | 51 DU single-family |

[23] Source: City of Brea, Fullerton, and Chino Hills Planning Departments.

## TABLE 6-2

## CUMULATIVE PROJECTS TRAFFIC GENERATION FORECAST[24]

| Cumulative Project Description | Weekday Daily 2-Way | AM Peak Hour | | | PM Peak Hour | | | Sat. Daily 2-Way | Sat. Midday Peak Hour | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Enter | Exit | Total | Enter | Exit | Total | | Enter | Exit | Total |
| 1. CVS | 1,948 | 59 | 58 | 117 | 59 | 58 | 117 | 2,042 | 87 | 90 | 177 |
| 2. Brea Place | 6,364 | 122 | 271 | 393 | 300 | 199 | 499 | 4,817 | 237 | 198 | 435 |
| 3. Downtown Hotel | 1,201 | 45 | 34 | 79 | 44 | 37 | 81 | 1,256 | 62 | 51 | 113 |
| 4. Mercury Apartments[25] | 653 | 11 | 32 | 43 | 32 | 21 | 53 | 589 | 26 | 27 | 53 |
| 5. Brea 265 Specific Plan[26,27] | 9,351 | 182 | 452 | 634 | 542 | 351 | 893 | 12,389 | 509 | 501 | 1,010 |
| 6. Brea Plaza[28] | -1,680 | 39 | 61 | 100 | -33 | -27 | -60 | -2,282 | -276 | -213 | -489 |
| 7. Central Park Village | 553 | 8 | 25 | 33 | 26 | 16 | 42 | 373 | 21 | 13 | 34 |
| 8. New Industrial Building | 247 | 22 | 5 | 27 | 9 | 22 | 31 | 22 | 5 | 3 | 8 |
| 9. Alvero Assisted Living | 213 | 9 | 6 | 15 | 8 | 12 | 20 | 240 | 10 | 12 | 22 |
| 10. Extra Space Self Storage | 183 | 6 | 5 | 11 | 9 | 10 | 19 | 224 | 14 | 8 | 22 |
| 11. Brea Imperial Center[29] | 1,315 | 58 | 60 | 118 | 56 | 37 | 93 | 1,214 | 106 | 90 | 196 |
| 12. Transwestern | 288 | 24 | 7 | 31 | 10 | 26 | 36 | 26 | 8 | 3 | 11 |
| 13. The Phoenix Club | 805 | 40 | 32 | 72 | 26 | 17 | 43 | 920 | 42 | 42 | 84 |
| 14. Aldi Grocery Store | 1,783 | 31 | 23 | 54 | 72 | 72 | 144 | 2,142 | 87 | 86 | 173 |
| 15. Starbucks with Drive-Thru | 961 | 52 | 51 | 103 | 35 | 35 | 70 | 983 | 53 | 52 | 105 |
| 16. Lambert Road Condos | 162 | 2 | 8 | 10 | 8 | 4 | 12 | 109 | 5 | 5 | 10 |
| 17. Brea Metro Office Condos | 222 | 3 | 10 | 13 | 11 | 6 | 17 | 150 | 8 | 6 | 14 |
| 18. Father's House | 269 | 13 | 8 | 21 | 14 | 16 | 30 | 1,465 | 468 | 339 | 807 |

[24] Source: *Trip Generation*, 11th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2021), unless otherwise noted.

[25] Source: *Mercury Apartments TIA*, prepared by LLG Engineers, dated July 2019.

[26] Source: *Draft Brea 265 Specific Plan TCA*, prepared by LLG Engineers, dated January 2022.

[27] Brea 265 Specific Plan Project has been included as a related project as part of Year 2045 background traffic conditions.

[28] Source: *Brea Plaza Expansion Revised TCA*, prepared by LLG Engineers, dated July 2021.

[29] Source: *Brea Imperial Center TIA*, prepared by Wildan Engineering, dated July 2018.

## TABLE 6-2 (CONTINUED)

## CUMULATIVE PROJECTS TRAFFIC GENERATION FORECAST[30]

| Cumulative Project Description | Weekday Daily 2-Way | AM Peak Hour | | | PM Peak Hour | | | Sat. Daily 2-Way | Sat. Midday Peak Hour | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Enter | Exit | Total | Enter | Exit | Total | | Enter | Exit | Total |
| 19. Cha Cha's Expansion | 262 | 13 | 10 | 23 | 9 | 5 | 14 | 299 | 13 | 14 | 27 |
| 20. Western Realco | 299 | 25 | 8 | 33 | 10 | 27 | 37 | 27 | 8 | 3 | 11 |
| 21. CAMP Transformation | 140 | 3 | 2 | 5 | 8 | 6 | 14 | 130 | 6 | 7 | 13 |
| 22. Brea Express Wash | 600 | 16 | 16 | 32 | 30 | 30 | 60 | 1,290 | 65 | 64 | 129 |
| 23. Raising Cane's[31] | 1,727 | 0 | 0 | 0 | 61 | 48 | 109 | 3,817 | 115 | 111 | 226 |
| 24. 3105 Yorba Linda Boulevard | 690 | 18 | 18 | 36 | 35 | 34 | 69 | 1,470 | 74 | 73 | 147 |
| 25. Beckman Business Center[32] | 7,564 | 583 | 172 | 755 | 253 | 599 | 852 | 2,363 | 154 | 134 | 288 |
| 26. Woodbridge Pacific Group (Canyon Hills/Hillcrest) | 358 | 7 | 20 | 27 | 23 | 13 | 36 | 360 | 19 | 16 | 35 |
| 27. Stonefield Development | 264 | 5 | 15 | 20 | 16 | 10 | 26 | 265 | 14 | 12 | 26 |
| 28. Morningfield Estates and Loving Savior of the Hills Lutheran Church and School Master Plan Addendum[33] | 264 | 36 | 33 | 69 | 24 | 26 | 50 | 69 | 4 | 3 | 7 |
| 29. Coptic Orthodox Church | 494 | 20 | 11 | 31 | 19 | 23 | 42 | 179 | 24 | 17 | 41 |
| 30. Buddhist Temple of Chino Hills[34] | 200 | 7 | 5 | 12 | 6 | 6 | 12 | 227 | 55 | 23 | 78 |
| 31. Hidden Oaks | 500 | 10 | 27 | 37 | 32 | 18 | 50 | 502 | 26 | 23 | 49 |
| 32. Paradise Ranch[35] | 481 | 10 | 28 | 38 | 32 | 18 | 50 | 487 | 25 | 22 | 47 |
| **Cumulative Projects Total Trip Generation Potential** | **38,681** | **1,479** | **1,513** | **2,992** | **1,786** | **1,775** | **3,561** | **38,164** | **2,074** | **1,835** | **3,909** |

30 Source: *Trip Generation*, 11th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2021), unless otherwise noted.

31 Source: *Focused Transportation Assessment for Raising Cane's Projct,* prepared by Kimley Horn, dated December 2020.

32 Source: *Beckman Business Center Proposed Building 6 Tenant/Land Use Modification TIA Report Addendum,* prepared by LLG Engineers, dated September 2019. Although this development is completely constructed, it was only partially occupied during the time the existing traffic counts were collected. Hence to provide a conservative assessment, all buildings are assumed to be vacant.

33 Source: *Morningfield Estates and Loving Savior of the Hills Lutheran Church and School Master Plan Addendum Traffic Impact Analysis,* prepared by LLG Engineers, dated April 12, 2017.

34 Source: *Buddhist Temple Traffic Impact Analysis,* prepared by LLG Engineers, dated January 23, 2017.

35 Source: *Paradise Ranch Traffic Study,* prepared by LLG Engineers, dated August 2021.

KEY

1. CVS
2. BREA PLACE
3. DOWNTOWN HOTEL
4. MERCURY APARTMENTS
5. BREA 265 SPECIFIC PLAN
6. BREA PLAZA
7. CENTRAL PARK VILLAGE
8. NEW INDUSTRIAL BUILDING
9. ALVERO ASSISTED LIVING
10. EXTRA SPACE SELF STORAGE
11. BREA IMPERIAL CENTER
12. TRANSWESTERN
13. THE PHOENIX CLUB
14. ALDI GROCERY STORE
15. STARBUCKS WITH DRIVE-THRU
16. LAMBERT ROAD CONDOS
17. BREA METRO OFFICE CONDOS
18. FATHER'S HOUSE
19. CHA CHA'S EXPANSION
20. WESTERN REALCO
21. CAMP TRANSFORMATION
22. BREA EXPRESS WASH
23. RAISING CANE'S
24. 3105 YORBA LINDA BOULEVARD
25. BECKMAN BUSINESS CENTER
26. WOODBRIDGE PACIFIC GROUP (CANYON HILLS/HILLCREST)
27. STONEFIELD DEVELOPMENT
28. MORNINGFIELD ESTATES AND LOVING SAVIOR OF THE HILLS LUTHERAN CHURCH AND SCHOOL MASTER PLAN ADDENDUM
29. COPTIC ORTHODOX CHURCH
30. BUDDHIST TEMPLE OF CHINO HILLS
31. HIDDEN OAKS
32. PARADISE RANCH

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: GOOGLE

KEY

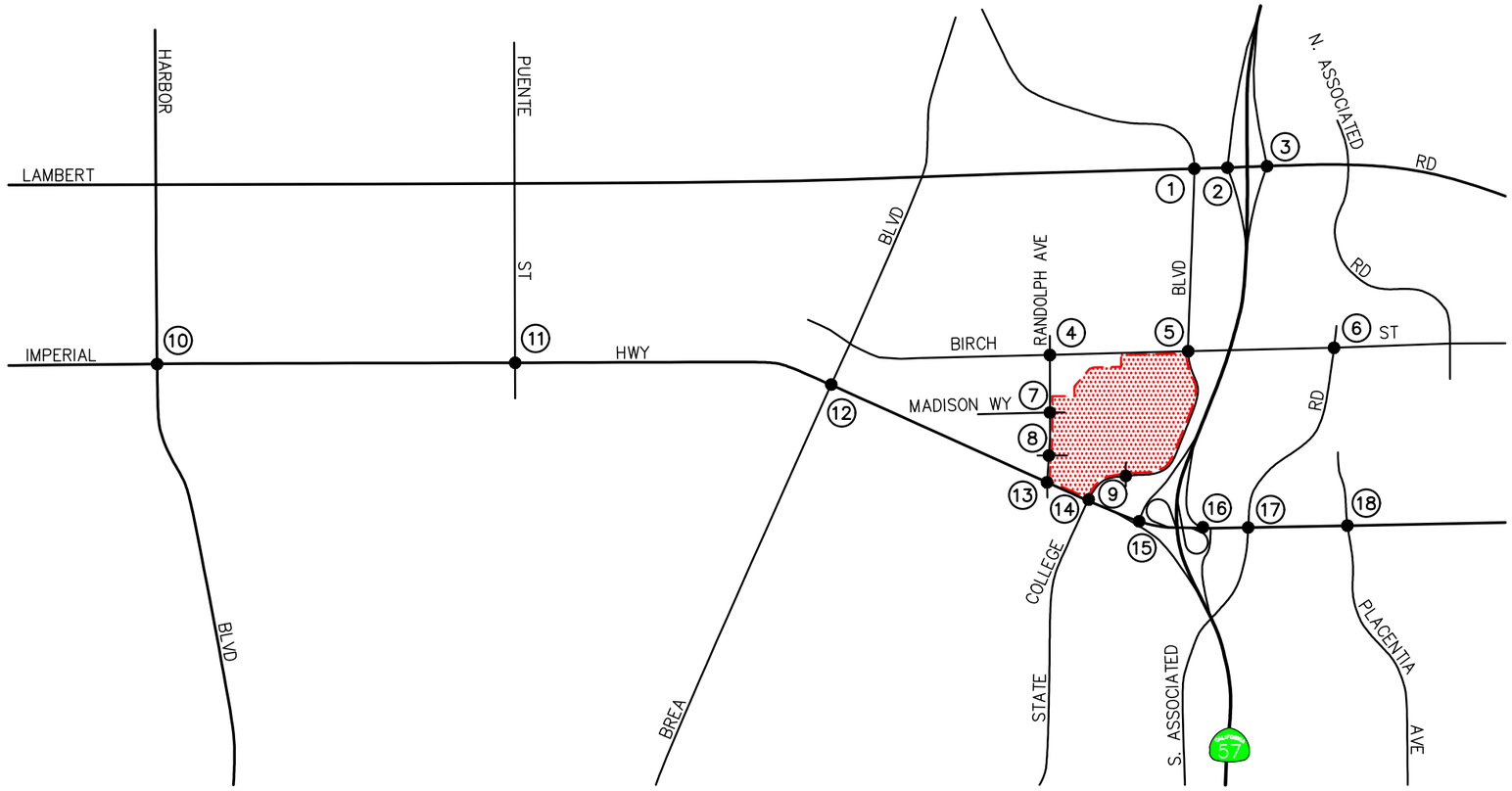
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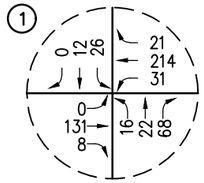
= PROJECT SITE

# FIGURE 6-1

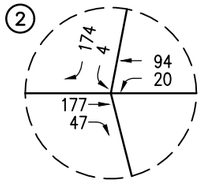
## LOCATION OF CUMULATIVE PROJECTS

BREA MALL MIXED-USE PROJECT, BREA

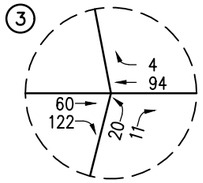


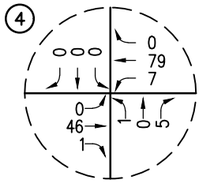

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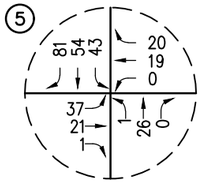

SR-57 SB RAMPS @ LAMBERT RD



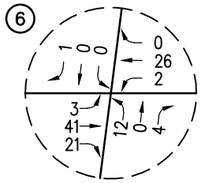

SR-57 NB RAMPS @ LAMBERT RD



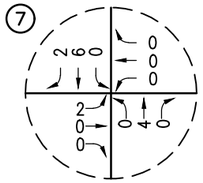

RANDOLPH AVE @ BIRCH ST



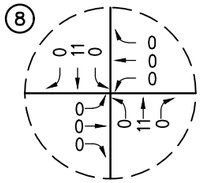

STATE COLLEGE BLVD @ BIRCH ST



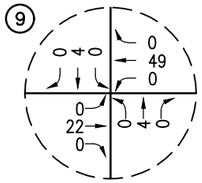

S. ASSOCIATED RD @ BIRCH ST



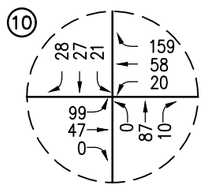

RANDOLPH AVE @ MADISON WAY



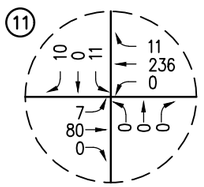

RANDOLPH AVE @ BREA MALL



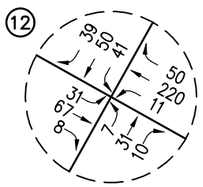

BREA MALL SOUTH @ STATE COLLEGE BLVD



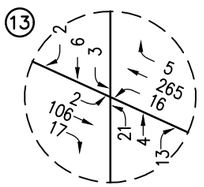

HARBOR BLVD @ IMPERIAL HWY



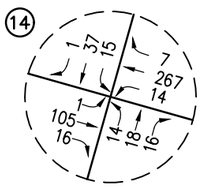

PUENTE ST @ IMPERIAL HWY



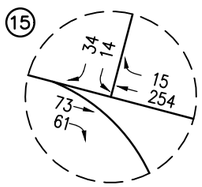

BREA BLVD @ IMPERIAL HWY



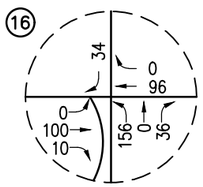

RANDOLPH AVE @ IMPERIAL HWY



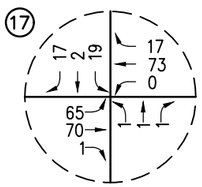

STATE COLLEGE BLVD @ IMPERIAL HWY



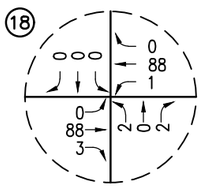

SR-57 SB RAMPS @ IMPERIAL HWY




SR-57 NB RAMPS @ IMPERIAL HWY




ASSOCIATED RD @ IMPERIAL HWY




CASTLEGATE LN/PLACENTIA AVE @ IMPERIAL HWY

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

= BREA MALL

# FIGURE 6-2

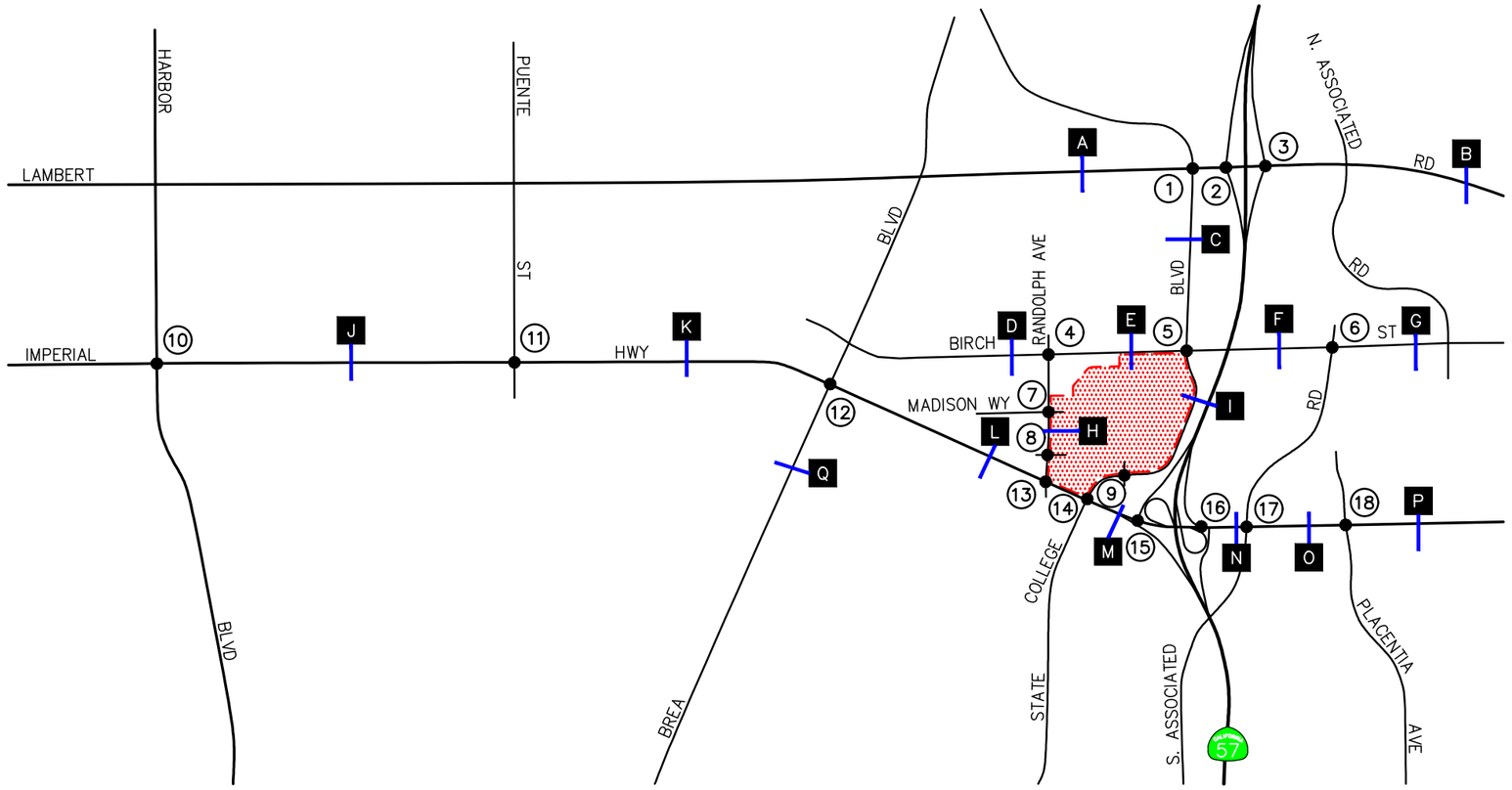
## WEEKDAY AM PEAK HOUR CUMULATIVE PROJECTS TRAFFIC VOLUMES

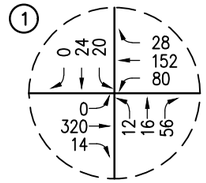
BREA MALL EXPANSION & IMPORVEMENTS, BREA



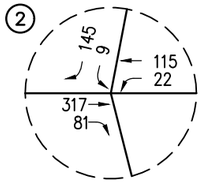
n:\4000\2194099 - brea mall expansion & improvement, brea\dwg\4099 prn base.dwg LDP 14:17:08 04-14-2022 kopulsky

| LOCATION | VOLUME |
|---|---|
| A | 4,615 |
| B | 2,005 |
| C | 2,470 |
| D | 2,294 |
| E | 2,843 |
| F | 1,779 |
| G | 1,237 |
| H | 290 |
| I | 1,331 |
| J | 2,846 |
| K | 3,465 |
| L | 4,772 |
| M | 3,448 |
| N | 2,864 |
| O | 2,490 |
| P | 2,557 |
| Q | 2,091 |

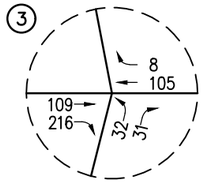


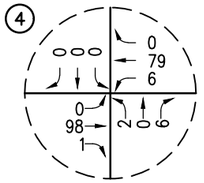
STATE COLLEGE BLVD @ LAMBERT RD



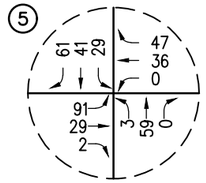
SR-57 SB RAMPS @ LAMBERT RD



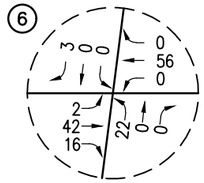
SR-57 NB RAMPS @ LAMBERT RD



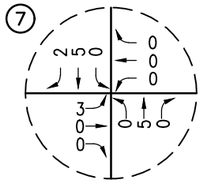
RANDOLPH AVE @ BIRCH ST



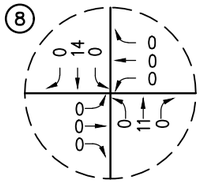
STATE COLLEGE BLVD @ BIRCH ST



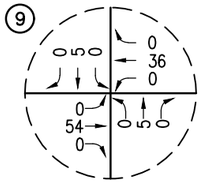
S. ASSOCIATED RD @ BIRCH ST



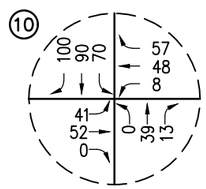
RANDOLPH AVE @ MADISON WAY



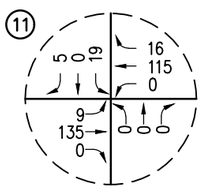
RANDOLPH AVE @ BREA MALL



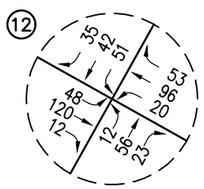
BREA MALL SOUTH @ STATE COLLEGE BLVD



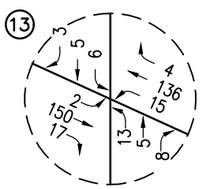
HARBOR BLVD @ IMPERIAL HWY



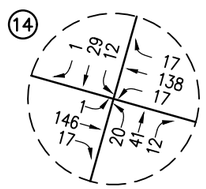
PUENTE ST @ IMPERIAL HWY



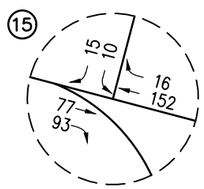
BREA BLVD @ IMPERIAL HWY



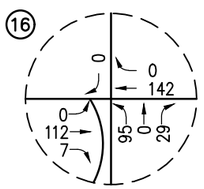
RANDOLPH AVE @ IMPERIAL HWY



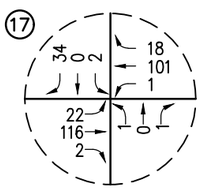
STATE COLLEGE BLVD @ IMPERIAL HWY



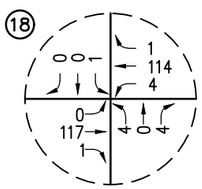
SR-57 SB RAMPS @ IMPERIAL HWY



SR-57 NB RAMPS @ IMPERIAL HWY



ASSOCIATED RD @ IMPERIAL HWY



CASTLEGATE LN/PLACENTIA AVE @ IMPERIAL HWY

KEY

(#) = STUDY INTERSECTION

# = STUDY ROADWAY SEGMENT

= BREA MALL

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

# FIGURE 6-3

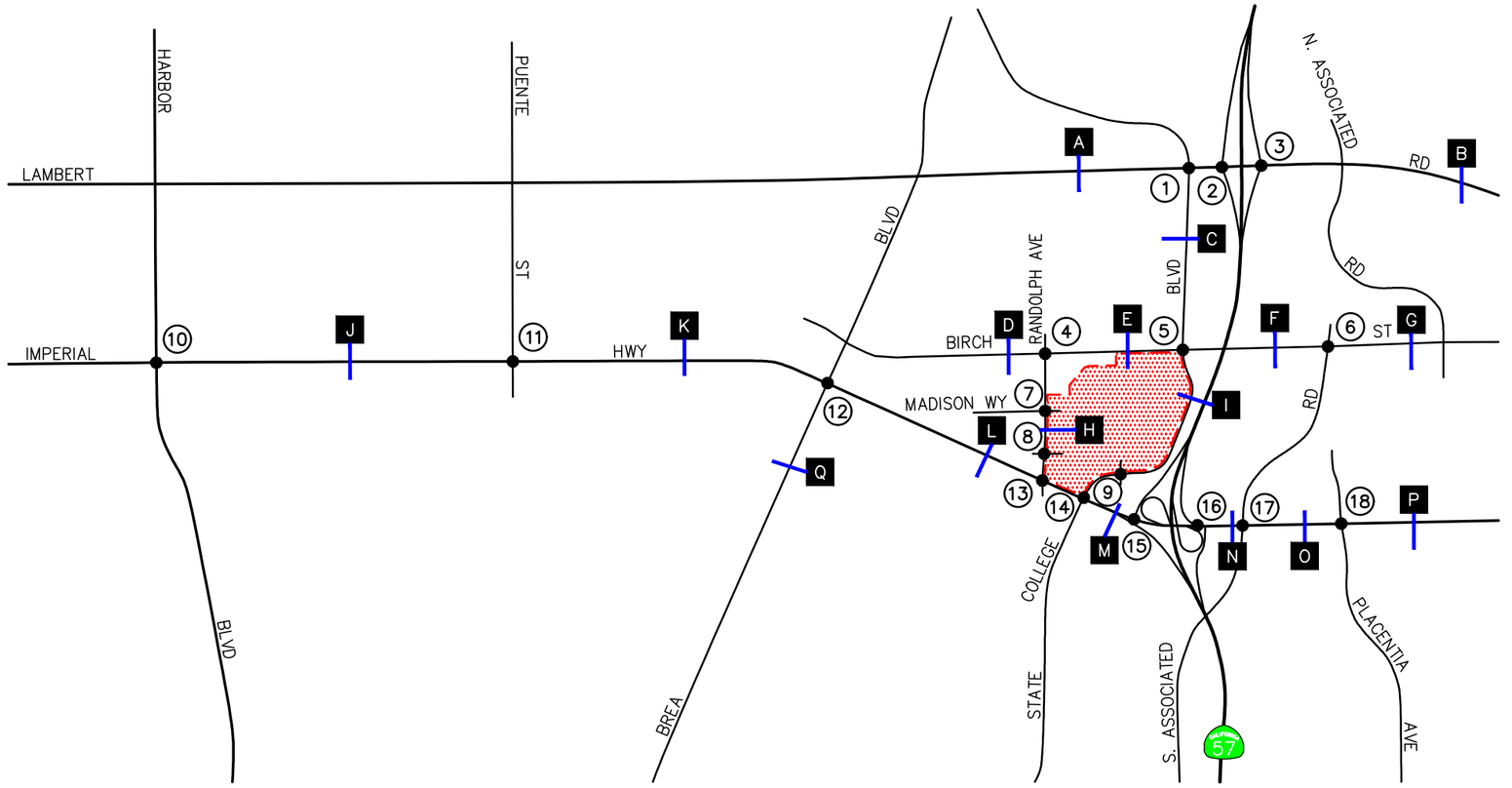
## WEEKDAY PM PEAK HOUR AND DAILY CUMULATIVE PROJECTS TRAFFIC VOLUMES

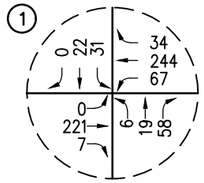
BREA MALL EXPANSION & IMPORVEMENTS, BREA



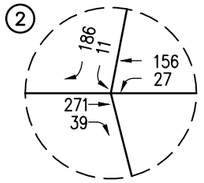
n:\4000\2194099 - brea mall expansion & improvement, brea\dwg\4099 prn base.dwg LDP 14:17:08 04-14-2022 kopulsky

| LOCATION | VOLUME |
|---|---|
| A | 4,561 |
| B | 1,969 |
| C | 1,901 |
| D | 1,915 |
| E | 2,371 |
| F | 1,530 |
| G | 1,096 |
| H | 274 |
| I | 1,037 |
| J | 2,585 |
| K | 3,182 |
| L | 4,535 |
| M | 3,131 |
| N | 2,765 |
| O | 2,364 |
| P | 2,454 |
| Q | 1,877 |

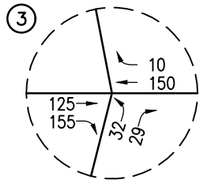


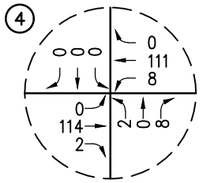

STATE COLLEGE BLVD @ LAMBERT RD



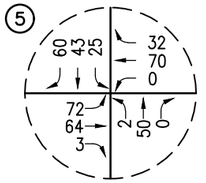

SR-57 SB RAMPS @ LAMBERT RD



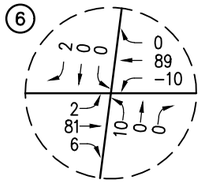

SR-57 NB RAMPS @ LAMBERT RD



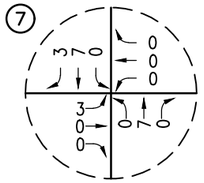

RANDOLPH AVE @ BIRCH ST



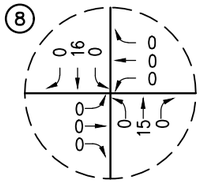

STATE COLLEGE BLVD @ BIRCH ST



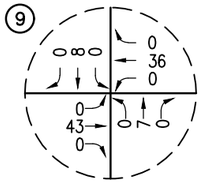

S. ASSOCIATED RD @ BIRCH ST



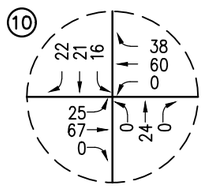

RANDOLPH AVE @ MADISON WAY



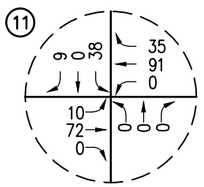

RANDOLPH AVE @ BREA MALL



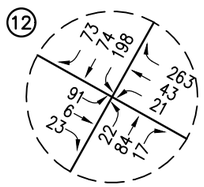

BREA MALL SOUTH @ STATE COLLEGE BLVD



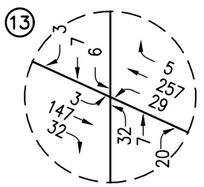

HARBOR BLVD @ IMPERIAL HWY



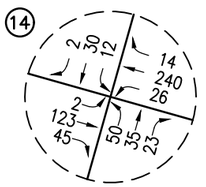

PUENTE ST @ IMPERIAL HWY



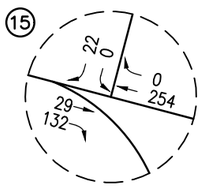

BREA BLVD @ IMPERIAL HWY



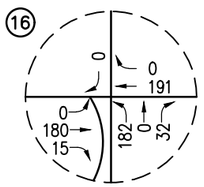

RANDOLPH AVE @ IMPERIAL HWY



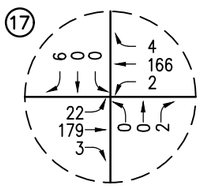

STATE COLLEGE BLVD @ IMPERIAL HWY



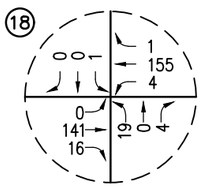

SR-57 SB RAMPS @ IMPERIAL HWY




SR-57 NB RAMPS @ IMPERIAL HWY




ASSOCIATED RD @ IMPERIAL HWY




CASTLEGATE LN/PLACENTIA AVE @ IMPERIAL HWY

n:\4000\2194099 - brea mall expansion & improvement, brea\dwg\4099 prn base.dwg LDP 14:17:08 04-14-2022 kopulsky

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

[#] = STUDY ROADWAY SEGMENT

= BREA MALL

# FIGURE 6-4

## WEEKEND (SATURDAY) MIDDAY PEAK HOUR AND DAILY CUMULATIVE PROJECTS TRAFFIC VOLUMES

BREA MALL EXPANSION & IMPORVEMENTS, BREA

## 6.3 Year 2045 Traffic Conditions

As coordinated with City staff, the Year 2045 traffic volume forecasts for this traffic study were developed via the utilization of the OCTAM4.0 Year 2045 traffic model provided by OCTA. Specifically, daily, AM peak period and PM peak period link traffic volumes were provided by OCTA for the existing base year (i.e. Year 2012) and for the Year 2045 year. The AM peak period corresponds to a three-hour morning commute period while the PM peak period corresponds to a four-hour afternoon commute period. Using the peak period model runs and the OCTA approved peak hour factors (i.e. AM = 0.3566 and PM = 0.2662), the one-hour peak hour link traffic volumes were determined. These future year 2045 link traffic volumes were post-processed based on the relationship of the base year validation model run output to the base year ground traffic counts resulting in anticipated Year 2045 without project daily traffic volumes for the key roadway segments and AM peak hour/PM peak hour turning movements for the key study intersections.

***Appendix E*** presents the post-processing worksheets.

## 6.4 Year 2026 and Year 2045 Traffic Volumes

### 6.4.1 *Year 2026 Traffic Volumes*

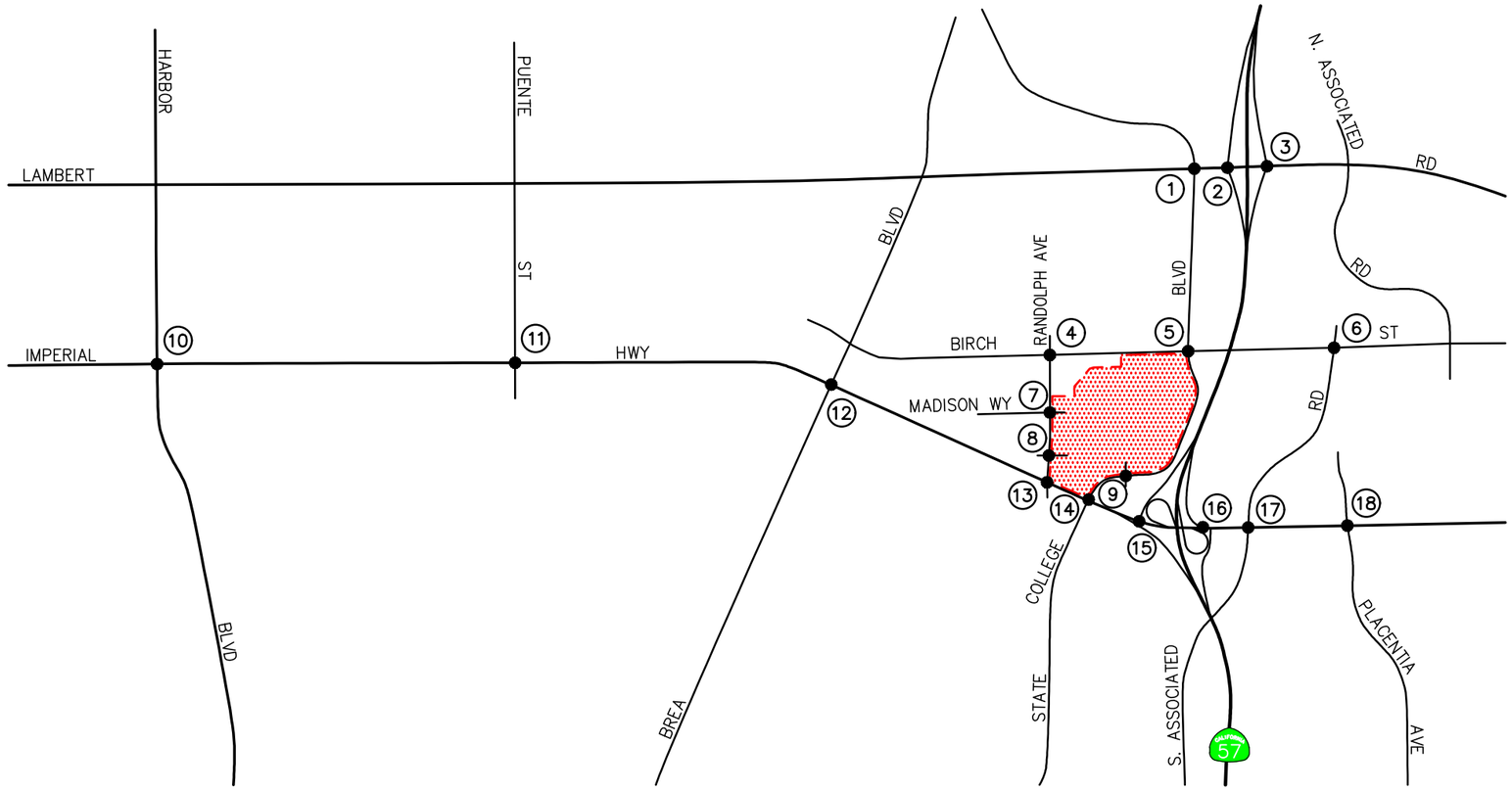
***Figures 6-5***, ***6-6*** and ***6-7*** present the weekday AM and PM peak hour and weekend (Saturday) midday peak hour cumulative traffic volumes (existing traffic + ambient growth + related projects) at the eighteen (18) key study intersections for the Year 2026, respectively. *Figures 6-6* and *6-7* also presents the Year 2026 daily cumulative traffic volumes during a weekday and weekend, respectively.

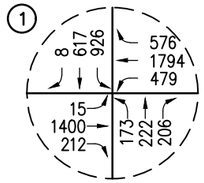
***Figures 6-8, 6-9*** and ***6-10*** illustrate the Year 2026 forecast AM and PM peak hour traffic volumes, with the inclusion of the trips generated by the proposed Project, respectively. *Figures 6-9* and *6-10* also presents the Year 2026 daily cumulative plus project traffic volumes.

### 6.4.2 *Year 2045 Traffic Volumes*

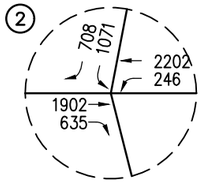
***Figures 6-11, 6-12*** and ***6-13*** present the anticipated Year 2045 AM and PM peak hour cumulative traffic volumes at the eighteen (18) key study intersections, respectively. *Figures 6-12* and *6-13* also presents the Year 2045 daily cumulative traffic volumes.

***Figures 6-14, 6-15*** and ***6-16*** illustrate the anticipated Year 2045 forecast AM and PM peak hour traffic volumes, with the inclusion of the trips generated by the proposed Project, respectively. *Figures 6-15* and *6-16* also presents the Year 2045 daily cumulative plus project traffic volumes.

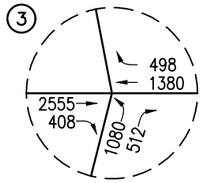


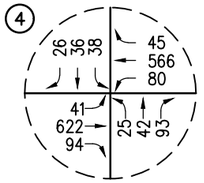

STATE COLLEGE BLVD @ LAMBERT RD



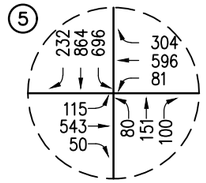

SR-57 SB RAMPS @ LAMBERT RD



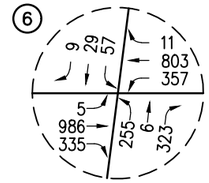

SR-57 NB RAMPS @ LAMBERT RD



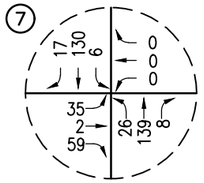

RANDOLPH AVE @ BIRCH ST



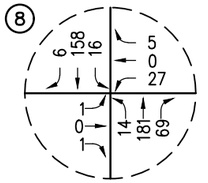

STATE COLLEGE BLVD @ BIRCH ST



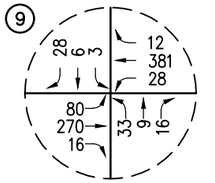

S. ASSOCIATED RD @ BIRCH ST



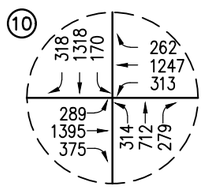

RANDOLPH AVE @ MADISON WAY



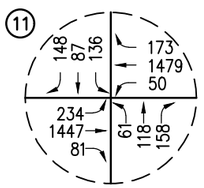

RANDOLPH AVE @ BREA MALL



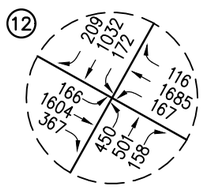

BREA MALL SOUTH @ STATE COLLEGE BLVD



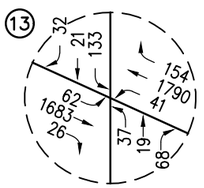

HARBOR BLVD @ IMPERIAL HWY



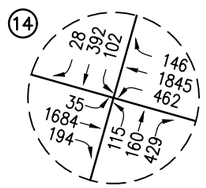

PUENTE ST @ IMPERIAL HWY



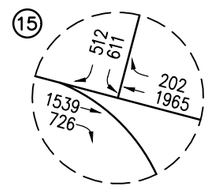

BREA BLVD @ IMPERIAL HWY



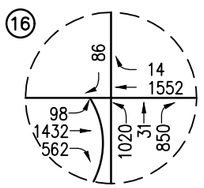

RANDOLPH AVE @ IMPERIAL HWY



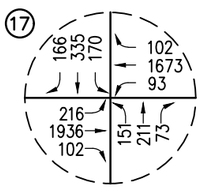

STATE COLLEGE BLVD @ IMPERIAL HWY



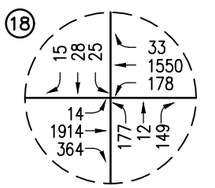

SR-57 SB RAMPS @ IMPERIAL HWY




SR-57 NB RAMPS @ IMPERIAL HWY




ASSOCIATED RD @ IMPERIAL HWY




CASTLEGATE LN/PLACENTIA AVE @ IMPERIAL HWY

n:\4000\2194099 - brea mall expansion & improvement, brea\dwg\4099 prn base.dwg LDP 14:17:08 04-14-2022 kopulsky

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

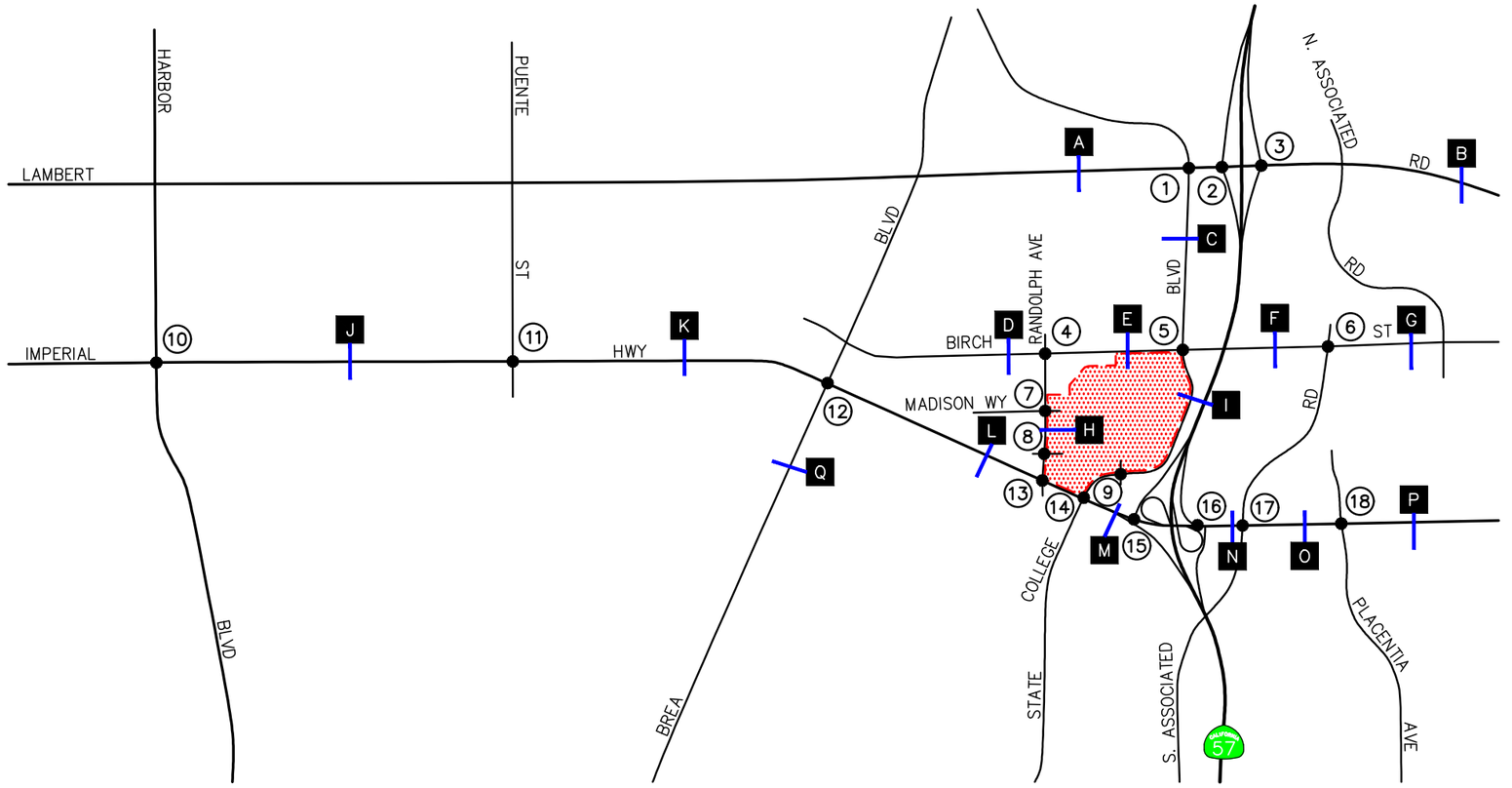
= BREA MALL

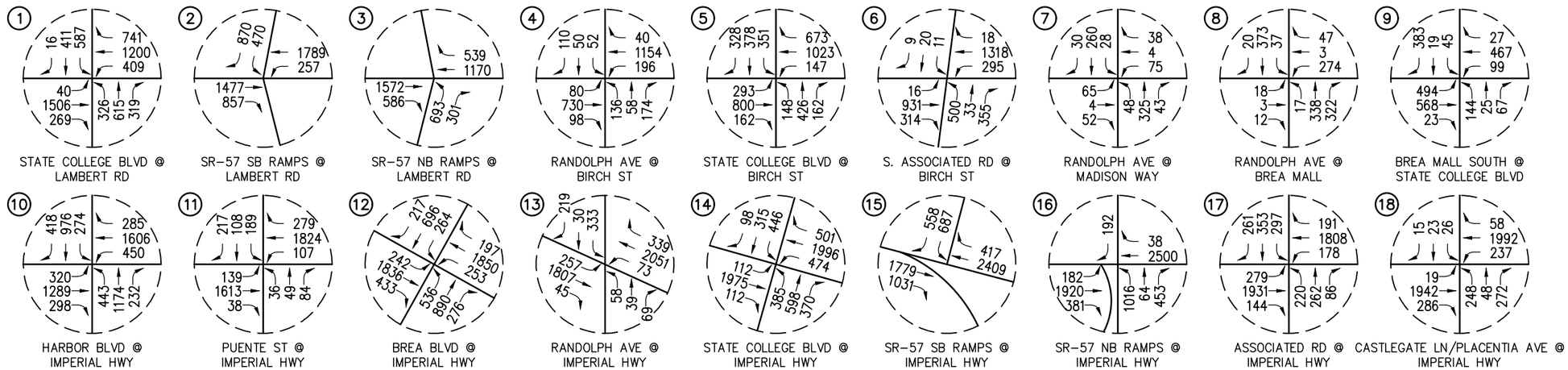
# FIGURE 6-5

## YEAR 2026 WEEKDAY AM PEAK HOUR CUMULATIVE TRAFFIC VOLUMES

BREA MALL EXPANSION & IMPORVEMENTS, BREA

| LOCATION | VOLUME |
|---|---|
| A | 45,190 |
| B | 38,514 |
| C | 26,228 |
| D | 21,805 |
| E | 23,963 |
| F | 28,797 |
| G | 27,712 |
| H | 8,601 |
| I | 16,157 |
| J | 49,037 |
| K | 64,947 |
| L | 63,247 |
| M | 82,664 |
| N | 61,674 |
| O | 58,953 |
| P | 59,107 |
| Q | 35,573 |




LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

# = STUDY ROADWAY SEGMENT

= BREA MALL

# FIGURE 6-6

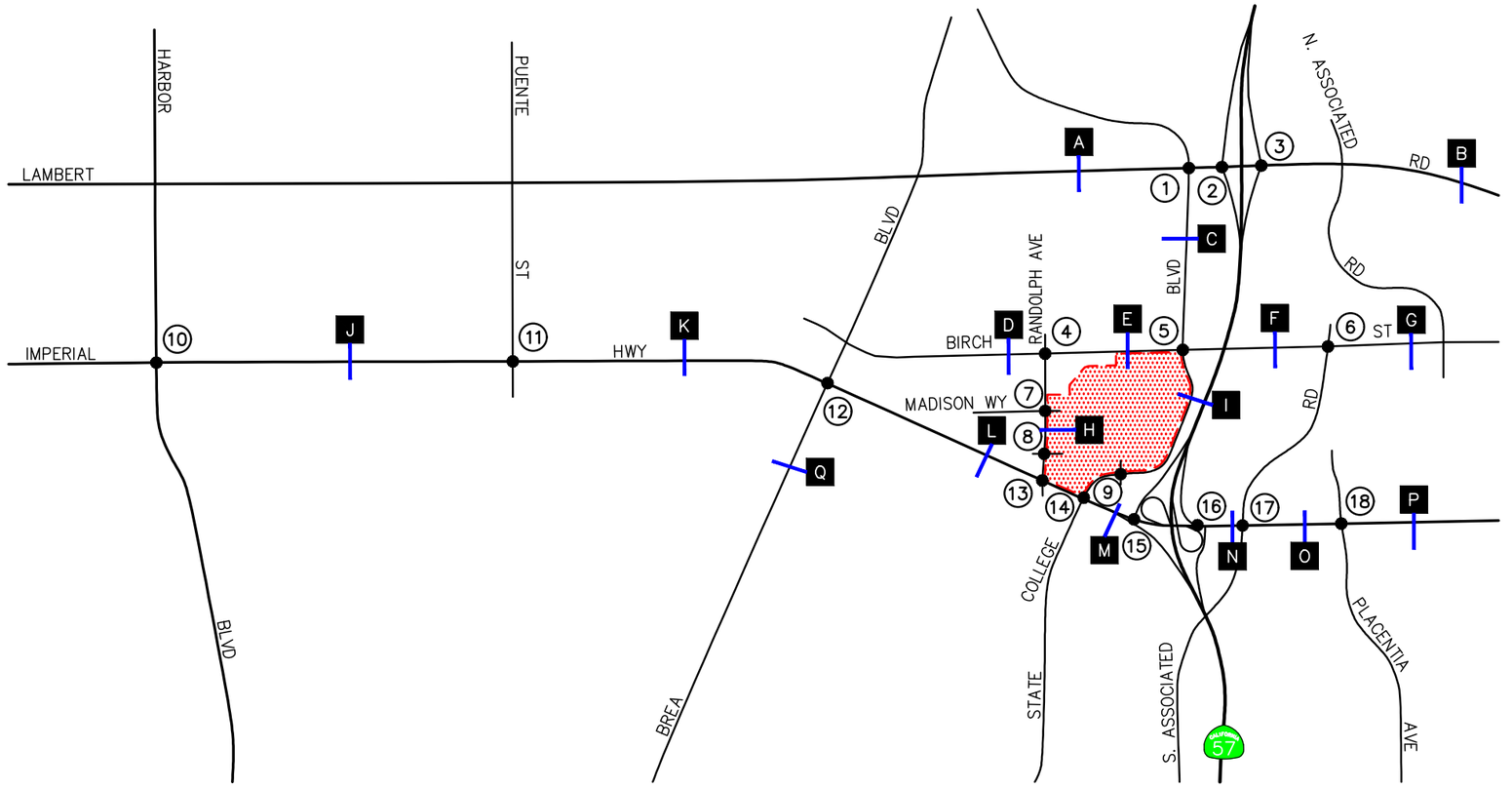
## YEAR 2026 WEEKDAY PM PEAK HOUR AND DAILY CUMULATIVE TRAFFIC VOLUMES

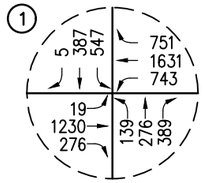
BREA MALL EXPANSION & IMPORVEMENTS, BREA



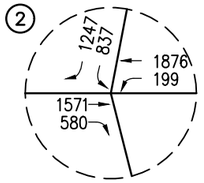
n:\4000\2194099 - brea mall expansion & improvement, brea\dwg\4099 prn base.dwg LDP 14:17:08 04-14-2022 kopulsky

| LOCATION | VOLUME |
|---|---|
| A | 46,736 |
| B | 39,922 |
| C | 26,608 |
| D | 22,206 |
| E | 21,320 |
| F | 29,617 |
| G | 28,620 |
| H | 8,822 |
| I | 16,463 |
| J | 50,619 |
| K | 67,121 |
| L | 65,371 |
| M | 85,546 |
| N | 63,931 |
| O | 61,084 |
| P | 61,251 |
| Q | 36,697 |

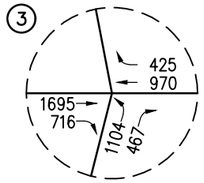


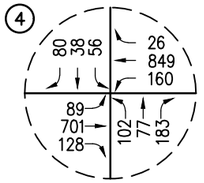
STATE COLLEGE BLVD @ LAMBERT RD



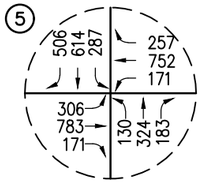
SR-57 SB RAMPS @ LAMBERT RD



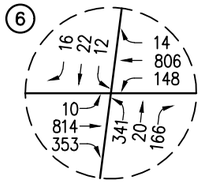
SR-57 NB RAMPS @ LAMBERT RD



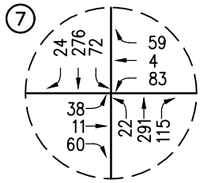
RANDOLPH AVE @ BIRCH ST



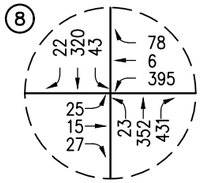
STATE COLLEGE BLVD @ BIRCH ST



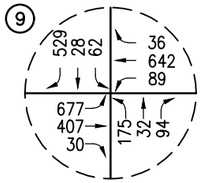
S. ASSOCIATED RD @ BIRCH ST



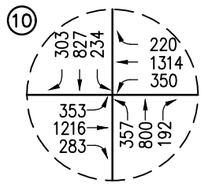
RANDOLPH AVE @ MADISON WAY



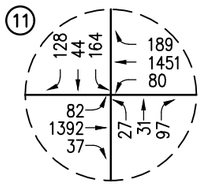
RANDOLPH AVE @ BREA MALL



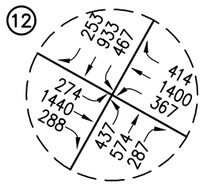
BREA MALL SOUTH @ STATE COLLEGE BLVD



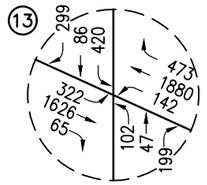
HARBOR BLVD @ IMPERIAL HWY



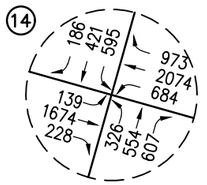
PUENTE ST @ IMPERIAL HWY



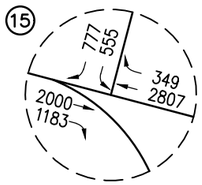
BREA BLVD @ IMPERIAL HWY



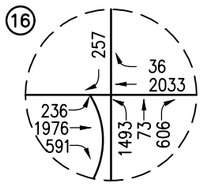
RANDOLPH AVE @ IMPERIAL HWY



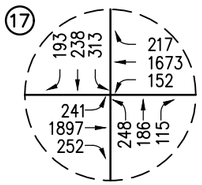
STATE COLLEGE BLVD @ IMPERIAL HWY



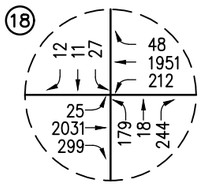
SR-57 SB RAMPS @ IMPERIAL HWY



SR-57 NB RAMPS @ IMPERIAL HWY



ASSOCIATED RD @ IMPERIAL HWY



CASTLEGATE LN/PLACENTIA AVE @ IMPERIAL HWY

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LINSCOTT LAW & GREENSPAN engineers

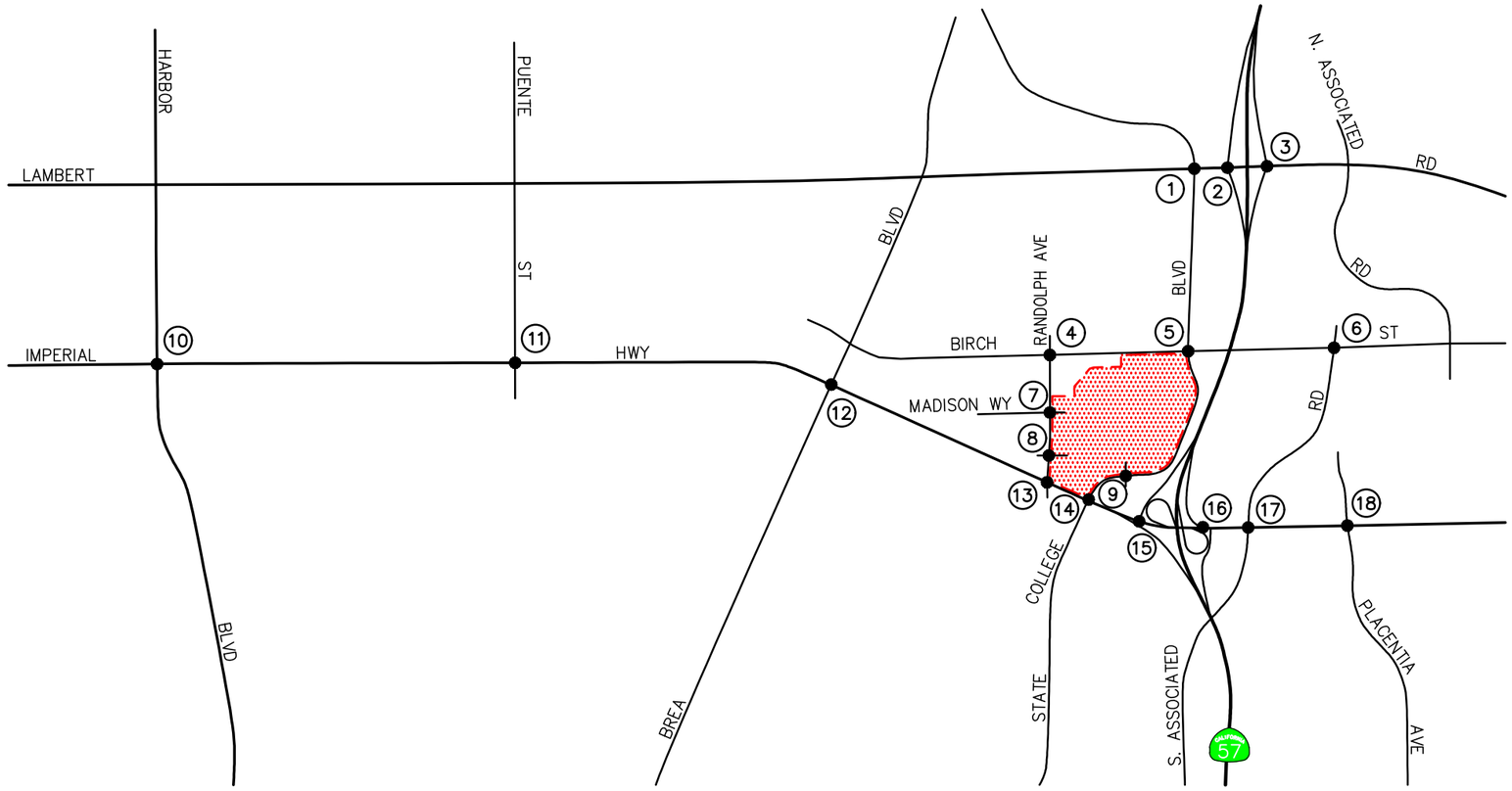
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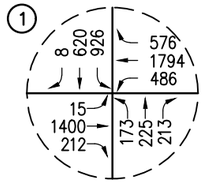
KEY
(#) = STUDY INTERSECTION
# = STUDY ROADWAY SEGMENT
= BREA MALL

# FIGURE 6-7

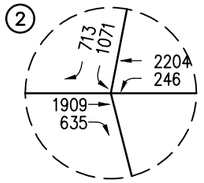
## YEAR 2026 WEEKEND (SATURDAY) MIDDAY PEAK HOUR AND DAILY CUMULATIVE TRAFFIC VOLUMES

BREA MALL EXPANSION & IMPORVEMENTS, BREA

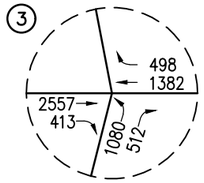


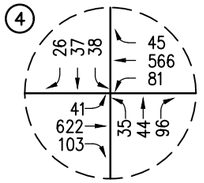

STATE COLLEGE BLVD @ LAMBERT RD



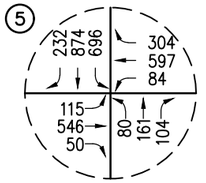

SR-57 SB RAMPS @ LAMBERT RD



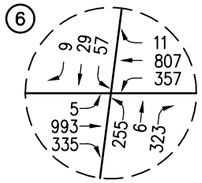

SR-57 NB RAMPS @ LAMBERT RD



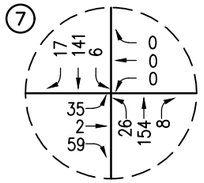

RANDOLPH AVE @ BIRCH ST



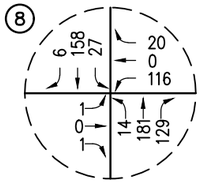

STATE COLLEGE BLVD @ BIRCH ST



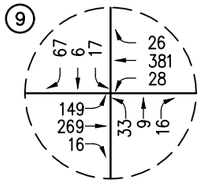

S. ASSOCIATED RD @ BIRCH ST



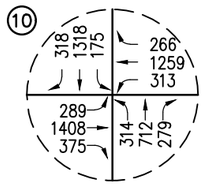

RANDOLPH AVE @ MADISON WAY



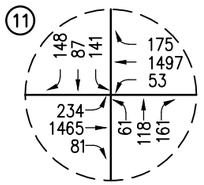

RANDOLPH AVE @ BREA MALL



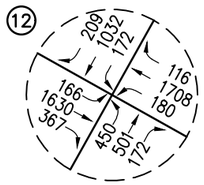

BREA MALL SOUTH @ STATE COLLEGE BLVD



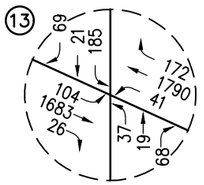

HARBOR BLVD @ IMPERIAL HWY



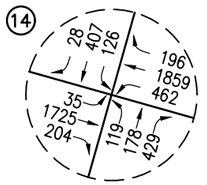

PUENTE ST @ IMPERIAL HWY



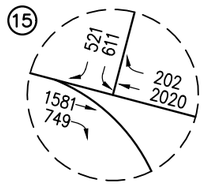

BREA BLVD @ IMPERIAL HWY



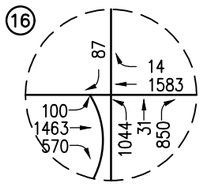

RANDOLPH AVE @ IMPERIAL HWY



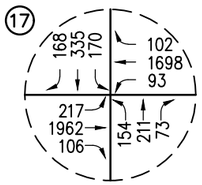

STATE COLLEGE BLVD @ IMPERIAL HWY



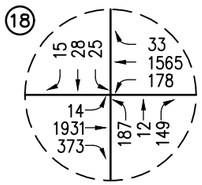

SR-57 SB RAMPS @ IMPERIAL HWY




SR-57 NB RAMPS @ IMPERIAL HWY




ASSOCIATED RD @ IMPERIAL HWY




CASTLEGATE LN/PLACENTIA AVE @ IMPERIAL HWY

n:\4000\2194099 - brea mall expansion & improvement, brea\dwg\4099 prn base.dwg LDP 14:17:08 04-14-2022 kopulsky

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

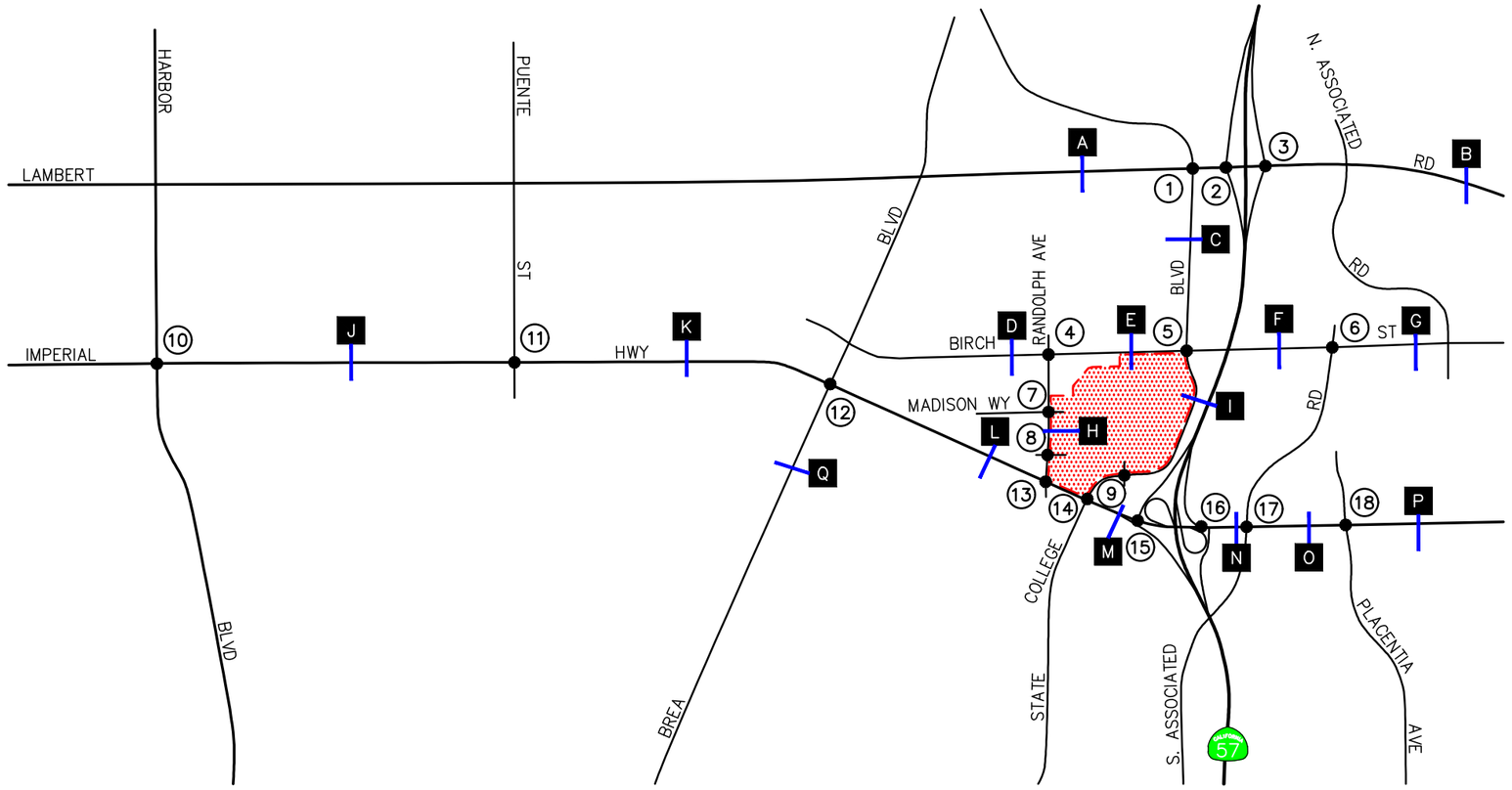
= BREA MALL

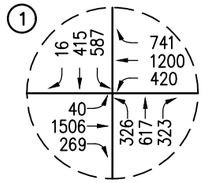
# FIGURE 6-8

## YEAR 2026 WEEKDAY AM PEAK HOUR CUMULATIVE TRAFFIC VOLUMES WITH PROJECT

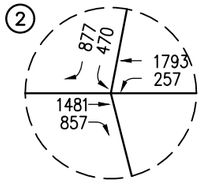
BREA MALL EXPANSION & IMPORVEMENTS, BREA

| LOCATION | VOLUME |
|---|---|
| A | *45,190* |
| B | *38,566* |
| C | *26,437* |
| D | *22,007* |
| E | *23,998* |
| F | *28,907* |
| G | *27,822* |
| H | *9,458* |
| I | *16,441* |
| J | *49,404* |
| K | *65,458* |
| L | *64,078* |
| M | *83,979* |
| N | *62,305* |
| O | *59,470* |
| P | *59,426* |
| Q | *35,854* |

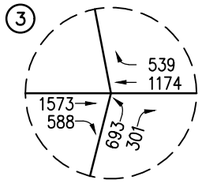


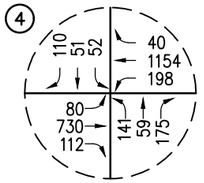
STATE COLLEGE BLVD @ LAMBERT RD



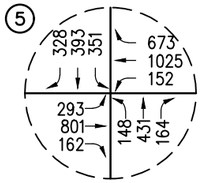
SR-57 SB RAMPS @ LAMBERT RD



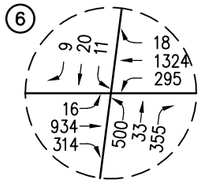
SR-57 NB RAMPS @ LAMBERT RD



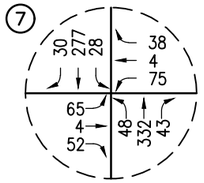
RANDOLPH AVE @ BIRCH ST



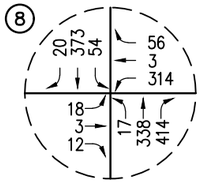
STATE COLLEGE BLVD @ BIRCH ST



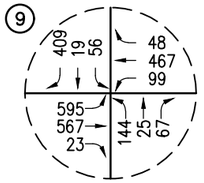
S. ASSOCIATED RD @ BIRCH ST



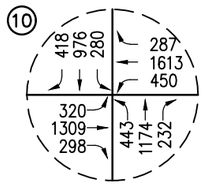
RANDOLPH AVE @ MADISON WAY



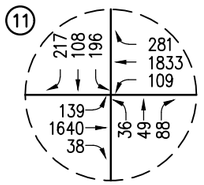
RANDOLPH AVE @ BREA MALL



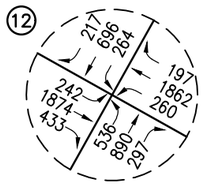
BREA MALL SOUTH @ STATE COLLEGE BLVD



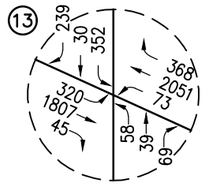
HARBOR BLVD @ IMPERIAL HWY



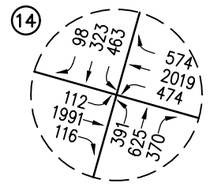
PUENTE ST @ IMPERIAL HWY



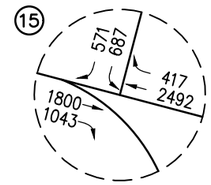
BREA BLVD @ IMPERIAL HWY



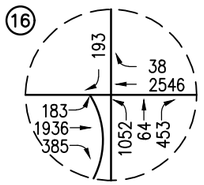
RANDOLPH AVE @ IMPERIAL HWY



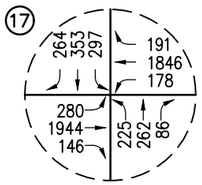
STATE COLLEGE BLVD @ IMPERIAL HWY



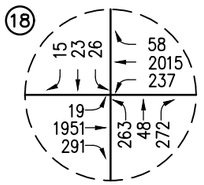
SR-57 SB RAMPS @ IMPERIAL HWY



SR-57 NB RAMPS @ IMPERIAL HWY



ASSOCIATED RD @ IMPERIAL HWY



CASTLEGATE LN/PLACENTIA AVE @ IMPERIAL HWY

n:\4000\2194099 - brea mall expansion & improvement, brea\dwg\4099 prn base.dwg LDP 14:17:08 04-14-2022 kopulsky

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

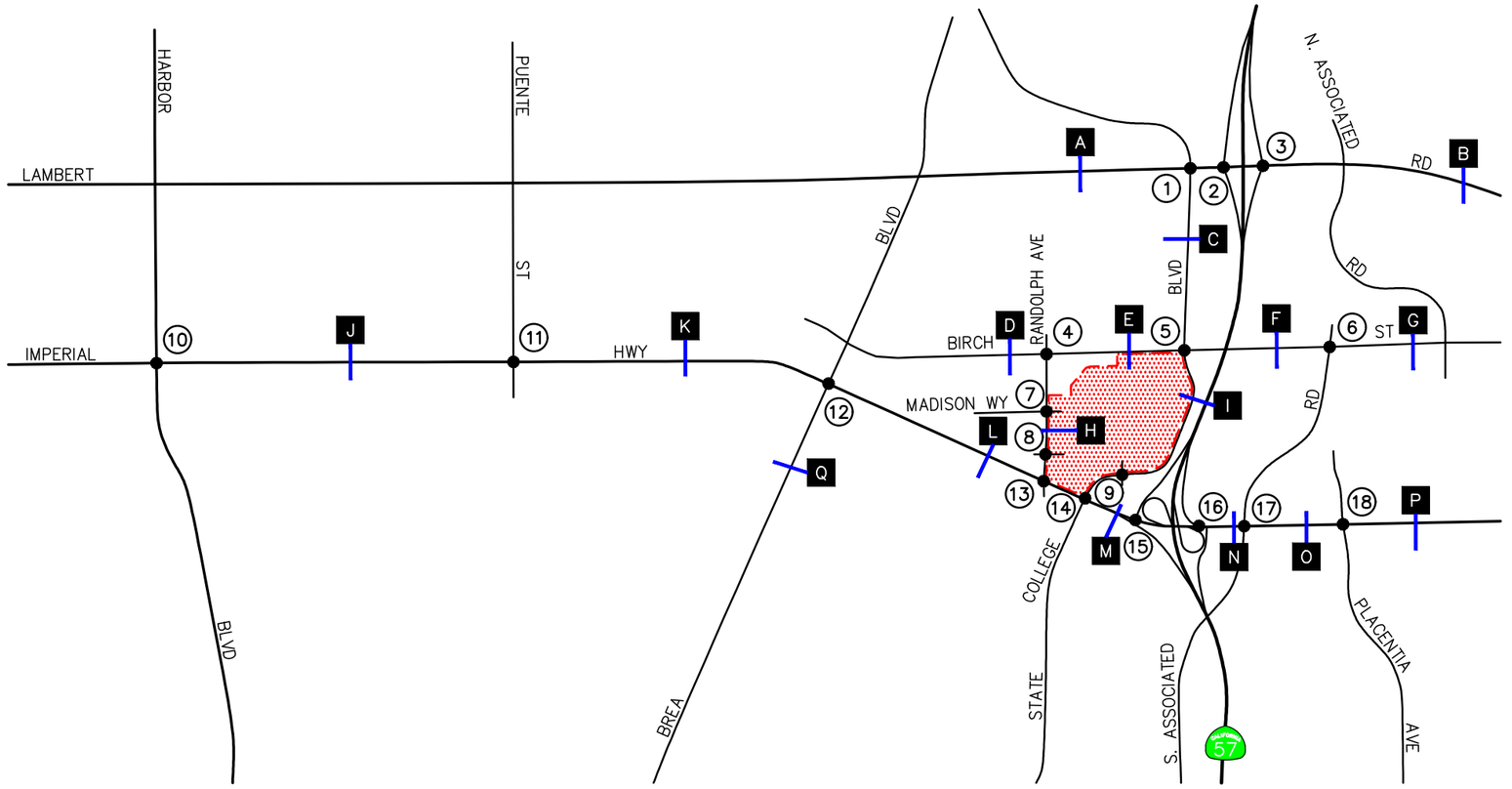
KEY
(#) = STUDY INTERSECTION
[#] = STUDY ROADWAY SEGMENT
= BREA MALL

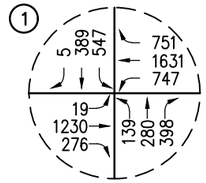
# FIGURE 6-9

## YEAR 2026 WEEKDAY PM PEAK HOUR AND DAILY CUMULATIVE TRAFFIC VOLUMES WITH PROJECT

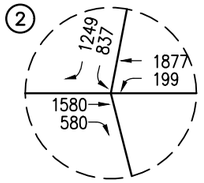
BREA MALL EXPANSION & IMPORVEMENTS, BREA

| LOCATION | VOLUME |
|---|---|
| A | 46,736 |
| B | 39,969 |
| C | 26,799 |
| D | 22,389 |
| E | 21,352 |
| F | 29,716 |
| G | 28,719 |
| H | 9,604 |
| I | 16,722 |
| J | 50,954 |
| K | 67,586 |
| L | 66,129 |
| M | 86,744 |
| N | 64,507 |
| O | 61,555 |
| P | 61,541 |
| Q | 36,953 |

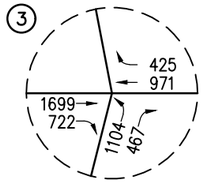


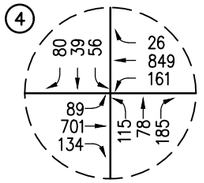
STATE COLLEGE BLVD @ LAMBERT RD



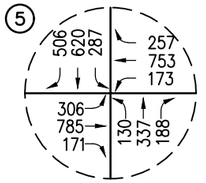
SR-57 SB RAMPS @ LAMBERT RD



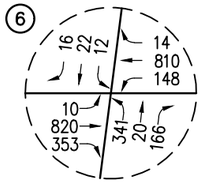
SR-57 NB RAMPS @ LAMBERT RD



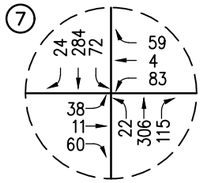
RANDOLPH AVE @ BIRCH ST



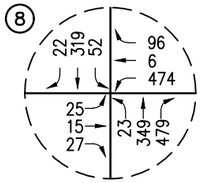
STATE COLLEGE BLVD @ BIRCH ST



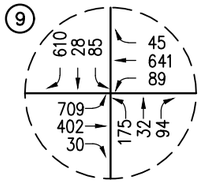
S. ASSOCIATED RD @ BIRCH ST



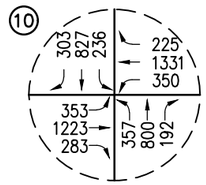
RANDOLPH AVE @ MADISON WAY



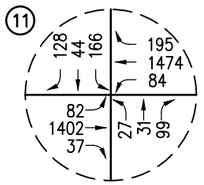
RANDOLPH AVE @ BREA MALL



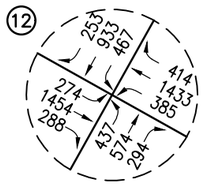
BREA MALL SOUTH @ STATE COLLEGE BLVD



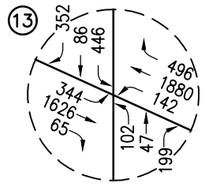
HARBOR BLVD @ IMPERIAL HWY



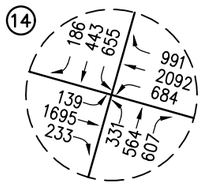
PUENTE ST @ IMPERIAL HWY



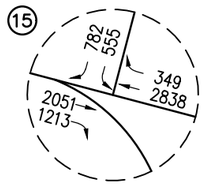
BREA BLVD @ IMPERIAL HWY



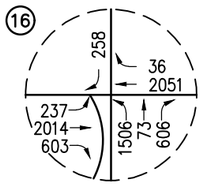
RANDOLPH AVE @ IMPERIAL HWY



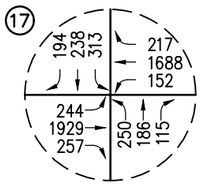
STATE COLLEGE BLVD @ IMPERIAL HWY



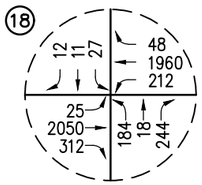
SR-57 SB RAMPS @ IMPERIAL HWY



SR-57 NB RAMPS @ IMPERIAL HWY



ASSOCIATED RD @ IMPERIAL HWY



CASTLEGATE LN/PLACENTIA AVE @ IMPERIAL HWY

n:\4000\2194099 - brea mall expansion & improvement, brea\dwg\4099 prn base.dwg LDP 14:17:08 04-14-2022 kopulsky

LINSCOTT LAW & GREENSPAN engineers

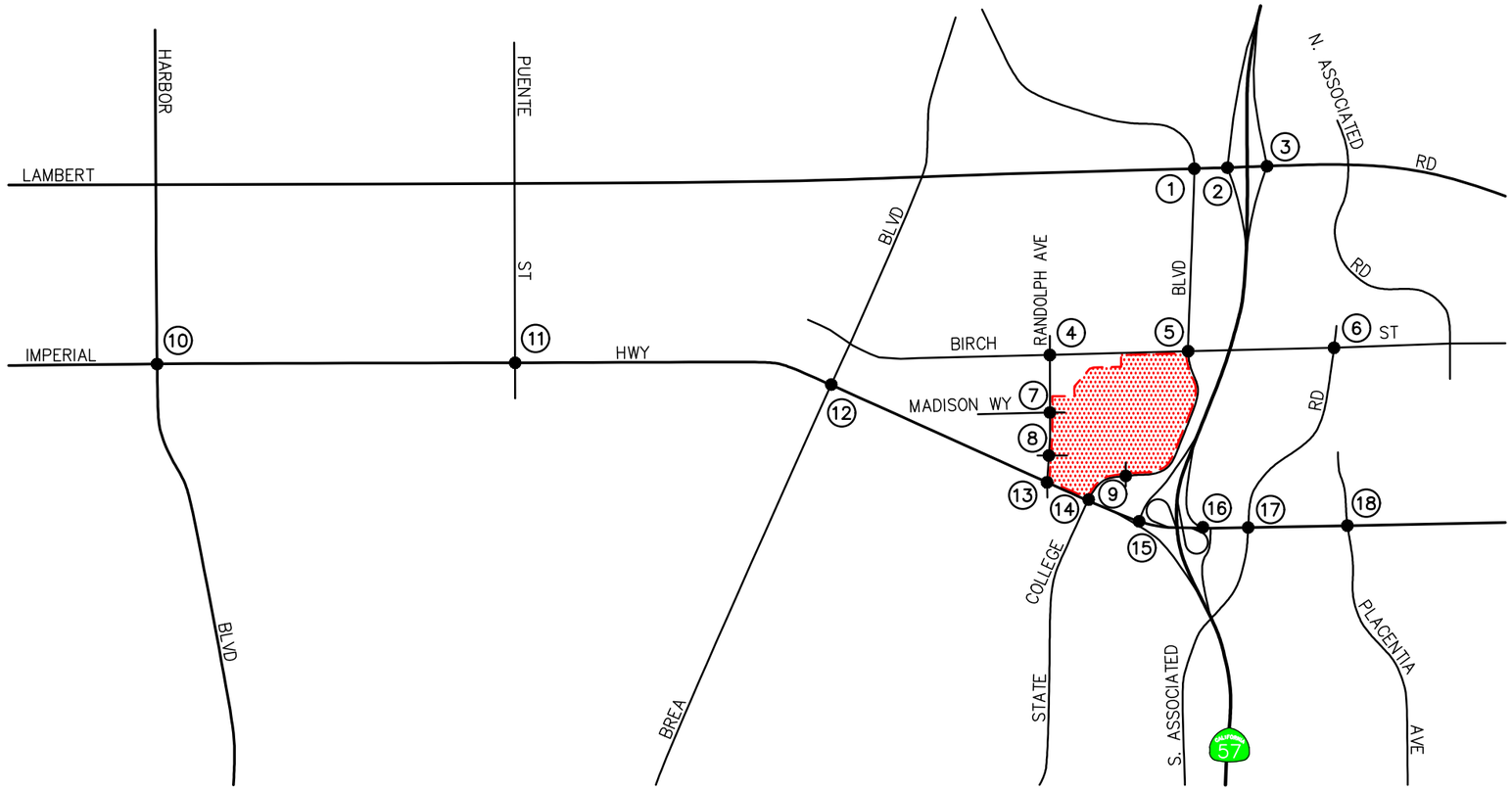
N NO SCALE

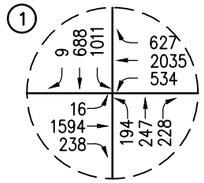
KEY
(#) = STUDY INTERSECTION
# = STUDY ROADWAY SEGMENT
= BREA MALL

# FIGURE 6-10

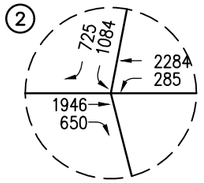
## YEAR 2026 WEEKEND (SATURDAY) MIDDAY PEAK HOUR AND DAILY CUMULATIVE TRAFFIC VOLUMES WITH PROJECT

BREA MALL EXPANSION & IMPORVEMENTS, BREA

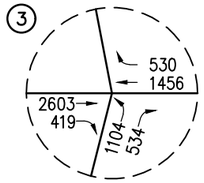


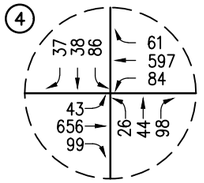

STATE COLLEGE BLVD @ LAMBERT RD



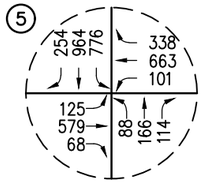

SR-57 SB RAMPS @ LAMBERT RD



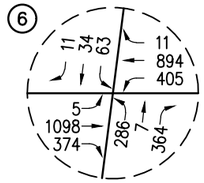

SR-57 NB RAMPS @ LAMBERT RD



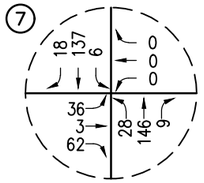

RANDOLPH AVE @ BIRCH ST



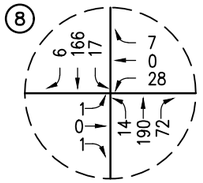

STATE COLLEGE BLVD @ BIRCH ST



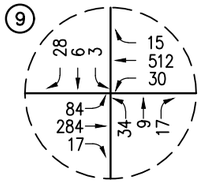

S. ASSOCIATED RD @ BIRCH ST



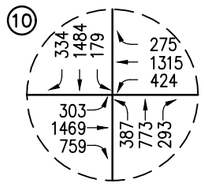

RANDOLPH AVE @ MADISON WAY



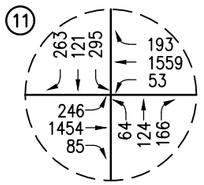

RANDOLPH AVE @ BREA MALL



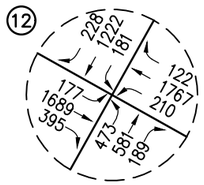

BREA MALL SOUTH @ STATE COLLEGE BLVD



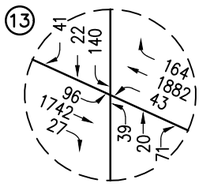

HARBOR BLVD @ IMPERIAL HWY



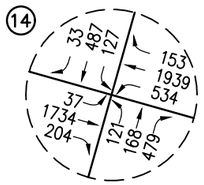

PUENTE ST @ IMPERIAL HWY



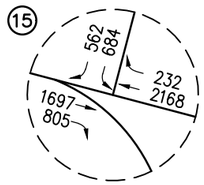

BREA BLVD @ IMPERIAL HWY



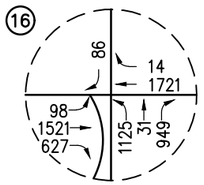

RANDOLPH AVE @ IMPERIAL HWY



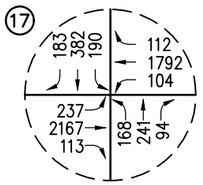

STATE COLLEGE BLVD @ IMPERIAL HWY



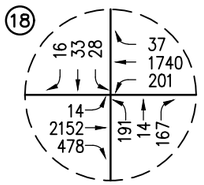

SR-57 SB RAMPS @ IMPERIAL HWY




SR-57 NB RAMPS @ IMPERIAL HWY




ASSOCIATED RD @ IMPERIAL HWY




CASTLEGATE LN/PLACENTIA AVE @ IMPERIAL HWY

n:\4000\2194099 - brea mall expansion & improvement, brea\dwg\4099 prn base.dwg LDP 14:17:08 04-14-2022 kopulsky

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

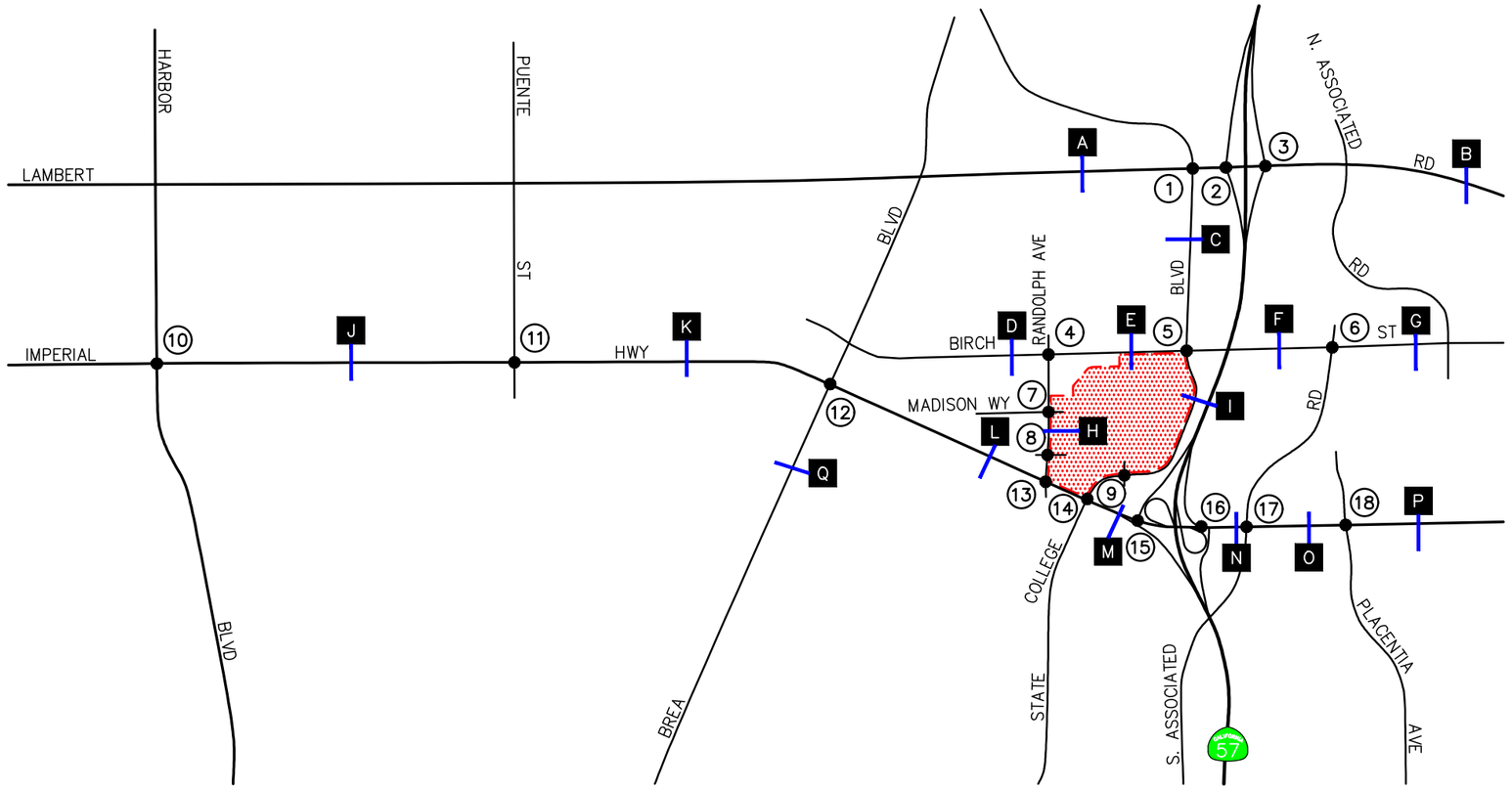
= BREA MALL

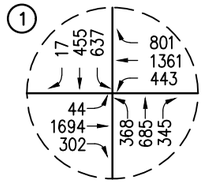
# FIGURE 6-11

## YEAR 2045 WEEKDAY AM PEAK HOUR TRAFFIC VOLUMES

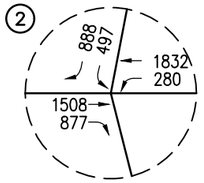
BREA MALL EXPANSION & IMPORVEMENTS, BREA

| LOCATION | VOLUME |
|---|---|
| A | 48,023 |
| B | 44,299 |
| C | 27,539 |
| D | 22,993 |
| E | 25,259 |
| F | 32,087 |
| G | 31,041 |
| H | 9,031 |
| I | 17,059 |
| J | 51,943 |
| K | 66,632 |
| L | 63,499 |
| M | 91,120 |
| N | 68,434 |
| O | 65,482 |
| P | 66,711 |
| Q | 37,557 |

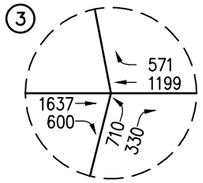


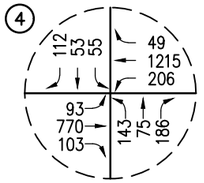
1 STATE COLLEGE BLVD @ LAMBERT RD



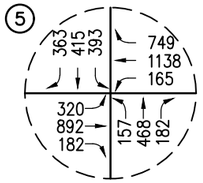
2 SR-57 SB RAMPS @ LAMBERT RD



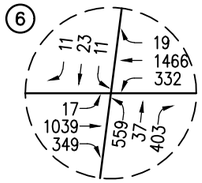
3 SR-57 NB RAMPS @ LAMBERT RD



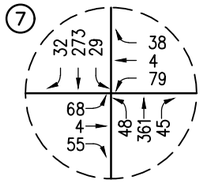
4 RANDOLPH AVE @ BIRCH ST



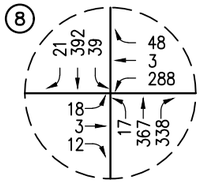
5 STATE COLLEGE BLVD @ BIRCH ST



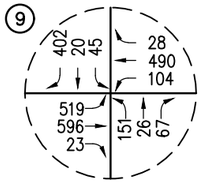
6 S. ASSOCIATED RD @ BIRCH ST



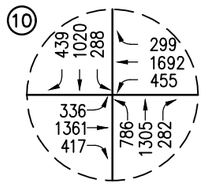
7 RANDOLPH AVE @ MADISON WAY



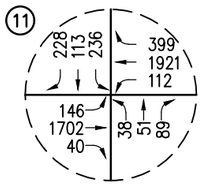
8 RANDOLPH AVE @ BREA MALL



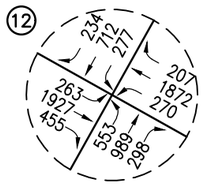
9 BREA MALL SOUTH @ STATE COLLEGE BLVD



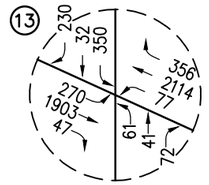
10 HARBOR BLVD @ IMPERIAL HWY



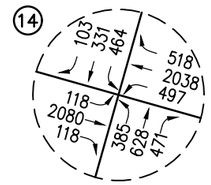
11 PUENTE ST @ IMPERIAL HWY



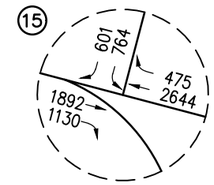
12 BREA BLVD @ IMPERIAL HWY



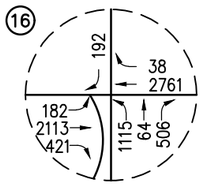
13 RANDOLPH AVE @ IMPERIAL HWY



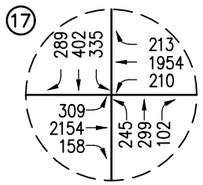
14 STATE COLLEGE BLVD @ IMPERIAL HWY



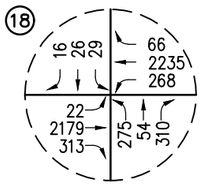
15 SR-57 SB RAMPS @ IMPERIAL HWY



16 SR-57 NB RAMPS @ IMPERIAL HWY



17 ASSOCIATED RD @ IMPERIAL HWY



18 CASTLEGATE LN/PLACENTIA AVE @ IMPERIAL HWY

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

[#] = STUDY ROADWAY SEGMENT

= BREA MALL

# FIGURE 6-12

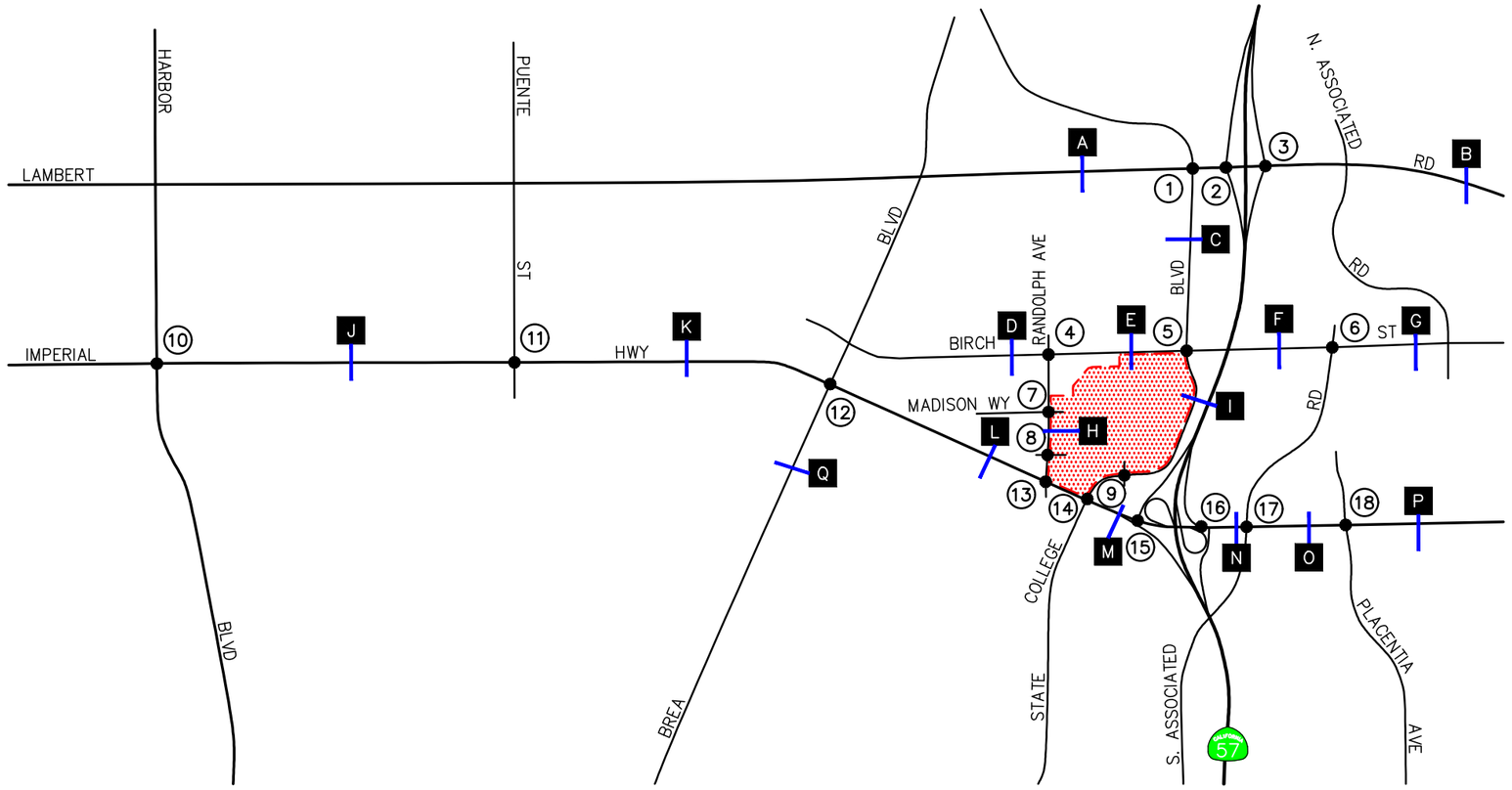
## YEAR 2045 WEEKDAY PM PEAK HOUR AND DAILY TRAFFIC VOLUMES

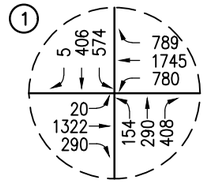
BREA MALL EXPANSION & IMPORVEMENTS, BREA



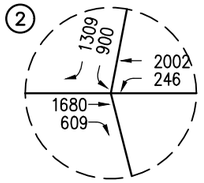
n:\4000\2194099 - brea mall expansion & improvement, brea\dwg\4099 prn base.dwg LDP 14:17:08 04-14-2022 kopulsky

| LOCATION | VOLUME |
|---|---|
| A | 49,936 |
| B | 44,355 |
| C | 27,938 |
| D | 23,464 |
| E | 22,534 |
| F | 31,367 |
| G | 30,481 |
| H | 9,263 |
| I | 17,410 |
| J | 54,098 |
| K | 69,377 |
| L | 66,237 |
| M | 88,426 |
| N | 65,610 |
| O | 64,329 |
| P | 63,741 |
| Q | 37,217 |

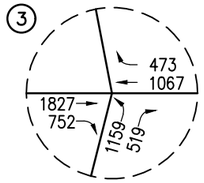


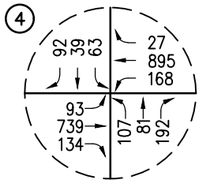
STATE COLLEGE BLVD @ LAMBERT RD



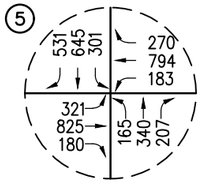
SR-57 SB RAMPS @ LAMBERT RD



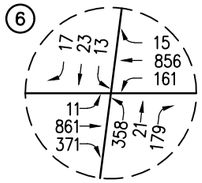
SR-57 NB RAMPS @ LAMBERT RD



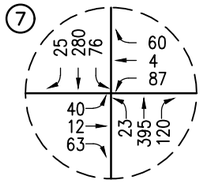
RANDOLPH AVE @ BIRCH ST



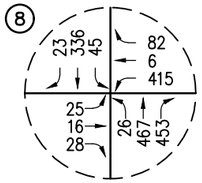
STATE COLLEGE BLVD @ BIRCH ST



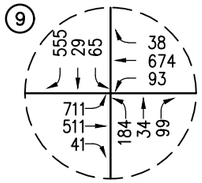
S. ASSOCIATED RD @ BIRCH ST



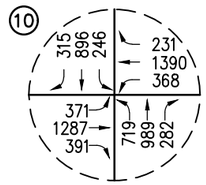
RANDOLPH AVE @ MADISON WAY



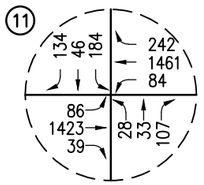
RANDOLPH AVE @ BREA MALL



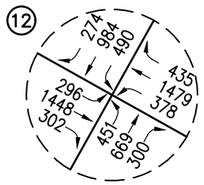
BREA MALL SOUTH @ STATE COLLEGE BLVD



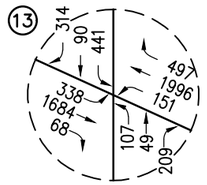
HARBOR BLVD @ IMPERIAL HWY



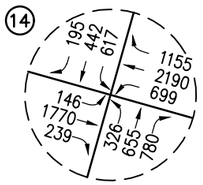
PUENTE ST @ IMPERIAL HWY



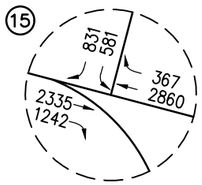
BREA BLVD @ IMPERIAL HWY



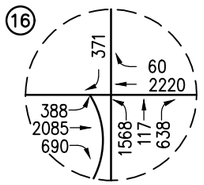
RANDOLPH AVE @ IMPERIAL HWY



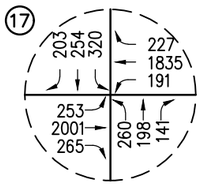
STATE COLLEGE BLVD @ IMPERIAL HWY



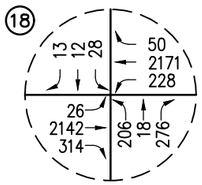
SR-57 SB RAMPS @ IMPERIAL HWY



SR-57 NB RAMPS @ IMPERIAL HWY



ASSOCIATED RD @ IMPERIAL HWY



CASTLEGATE LN/PLACENTIA AVE @ IMPERIAL HWY

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

# = STUDY ROADWAY SEGMENT

= BREA MALL

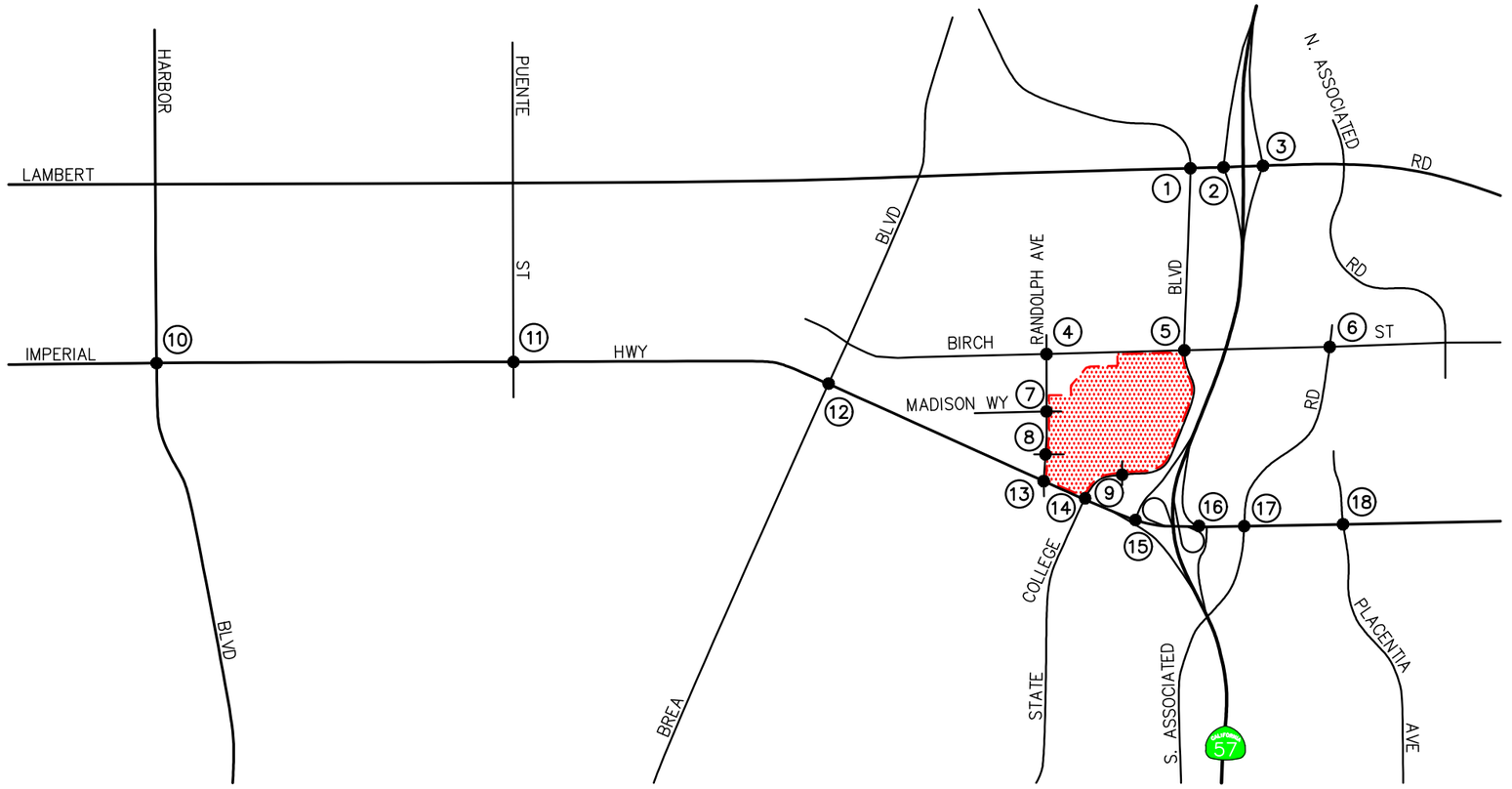
# FIGURE 6-13

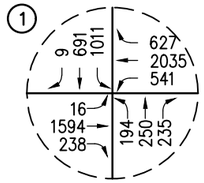
## YEAR 2045 WEEKEND (SATURDAY) MIDDAY PEAK HOUR AND DAILY TRAFFIC VOLUMES

BREA MALL EXPANSION & IMPORVEMENTS, BREA

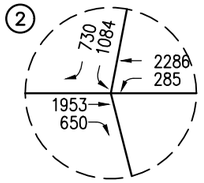


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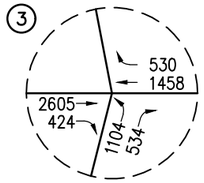


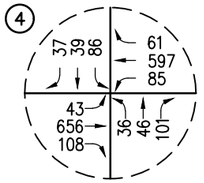

STATE COLLEGE BLVD @ LAMBERT RD



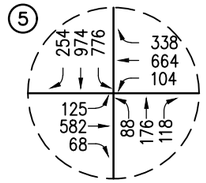

SR-57 SB RAMPS @ LAMBERT RD



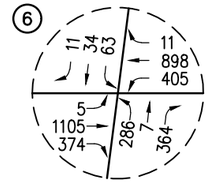

SR-57 NB RAMPS @ LAMBERT RD



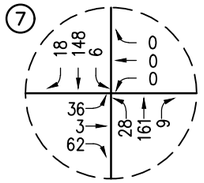

RANDOLPH AVE @ BIRCH ST



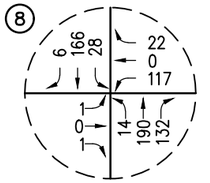

STATE COLLEGE BLVD @ BIRCH ST



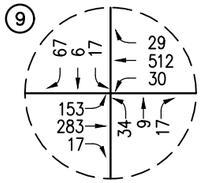

S. ASSOCIATED RD @ BIRCH ST



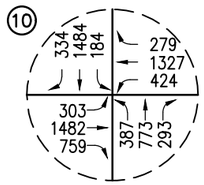

RANDOLPH AVE @ MADISON WAY



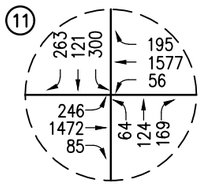

RANDOLPH AVE @ BREA MALL



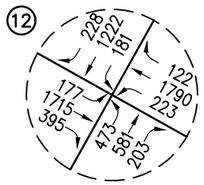

BREA MALL SOUTH @ STATE COLLEGE BLVD



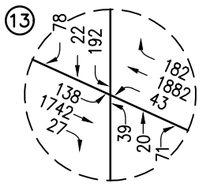

HARBOR BLVD @ IMPERIAL HWY



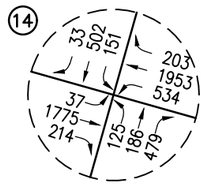

PUENTE ST @ IMPERIAL HWY



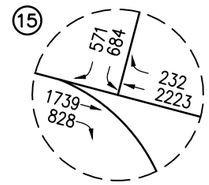

BREA BLVD @ IMPERIAL HWY



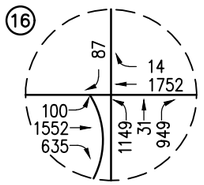

RANDOLPH AVE @ IMPERIAL HWY



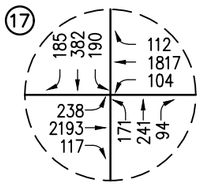

STATE COLLEGE BLVD @ IMPERIAL HWY



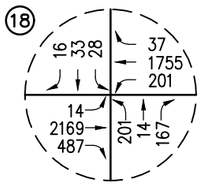

SR-57 SB RAMPS @ IMPERIAL HWY




SR-57 NB RAMPS @ IMPERIAL HWY




ASSOCIATED RD @ IMPERIAL HWY




CASTLEGATE LN/PLACENTIA AVE @ IMPERIAL HWY

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

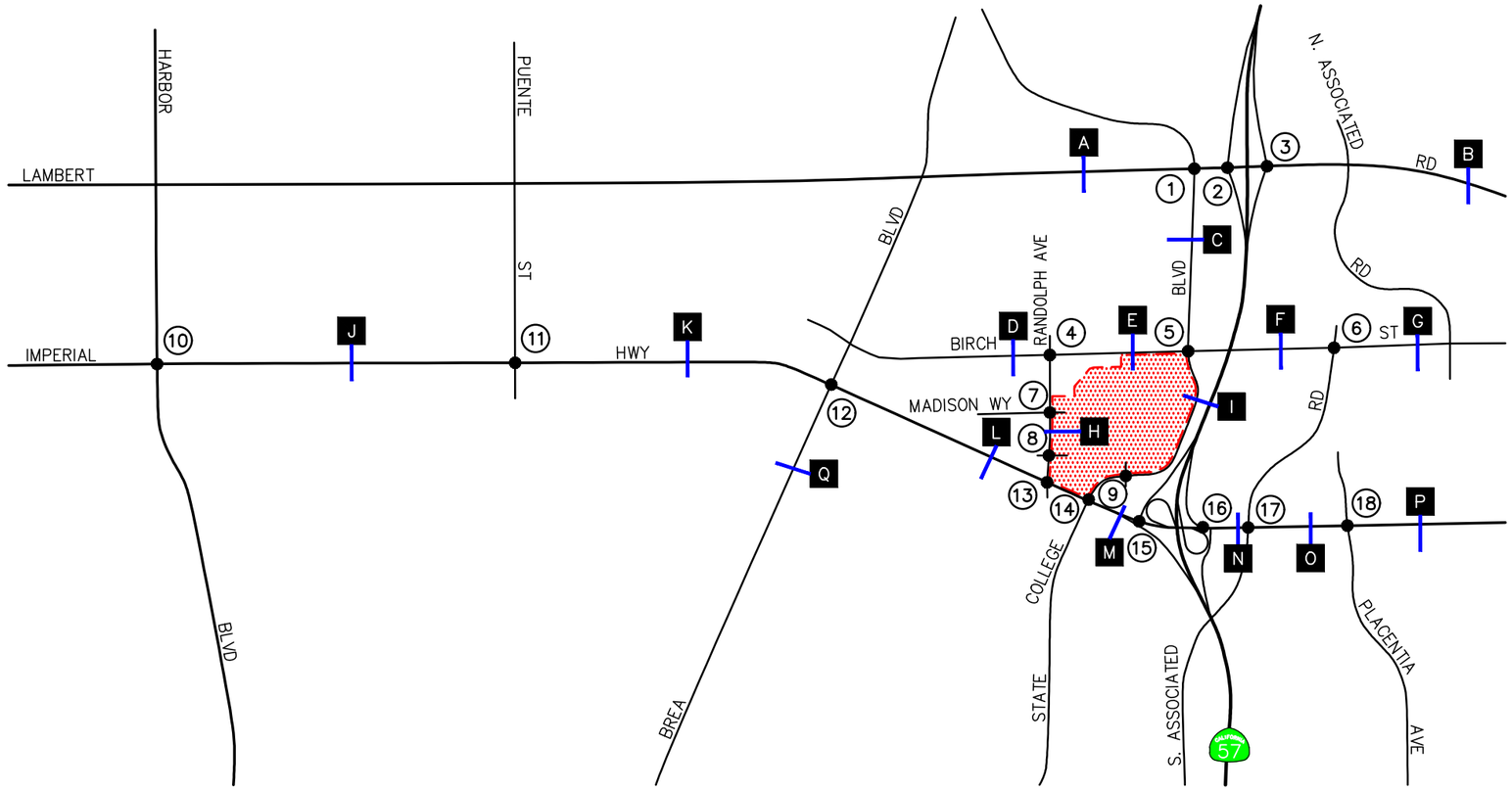
= BREA MALL

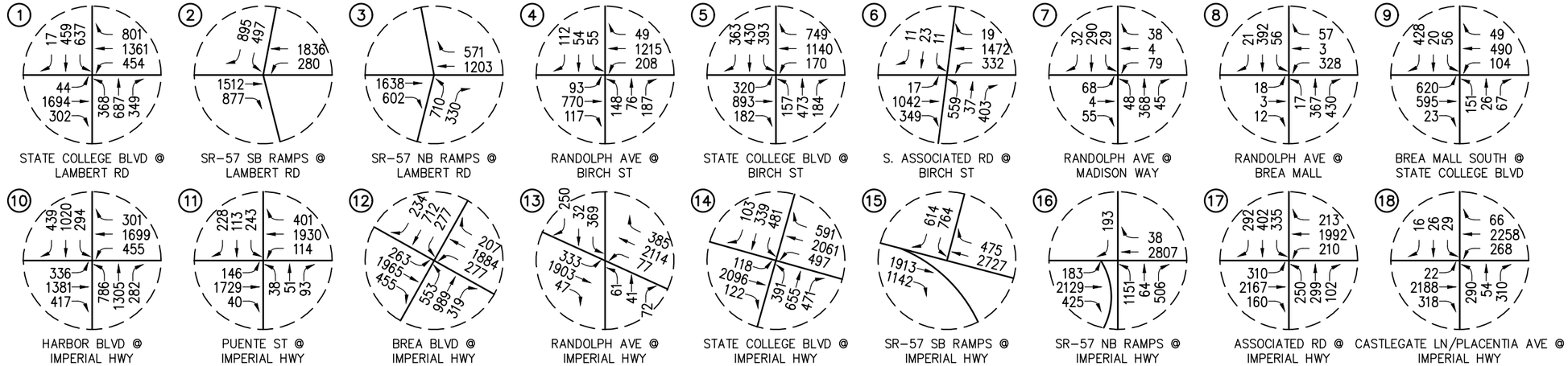
# FIGURE 6-14

## YEAR 2045 WEEKDAY AM PEAK HOUR TRAFFIC VOLUMES WITH PROJECT

BREA MALL EXPANSION & IMPORVEMENTS, BREA

| LOCATION | VOLUME |
|---|---|
| A | *48,023* |
| B | *44,351* |
| C | *27,748* |
| D | *23,195* |
| E | *25,294* |
| F | *32,197* |
| G | *31,151* |
| H | *9,888* |
| I | *17,343* |
| J | *52,310* |
| K | *67,143* |
| L | *64,330* |
| M | *92,435* |
| N | *69,065* |
| O | *65,999* |
| P | *67,030* |
| Q | *37,838* |




LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

# = STUDY ROADWAY SEGMENT

= BREA MALL

# FIGURE 6-15

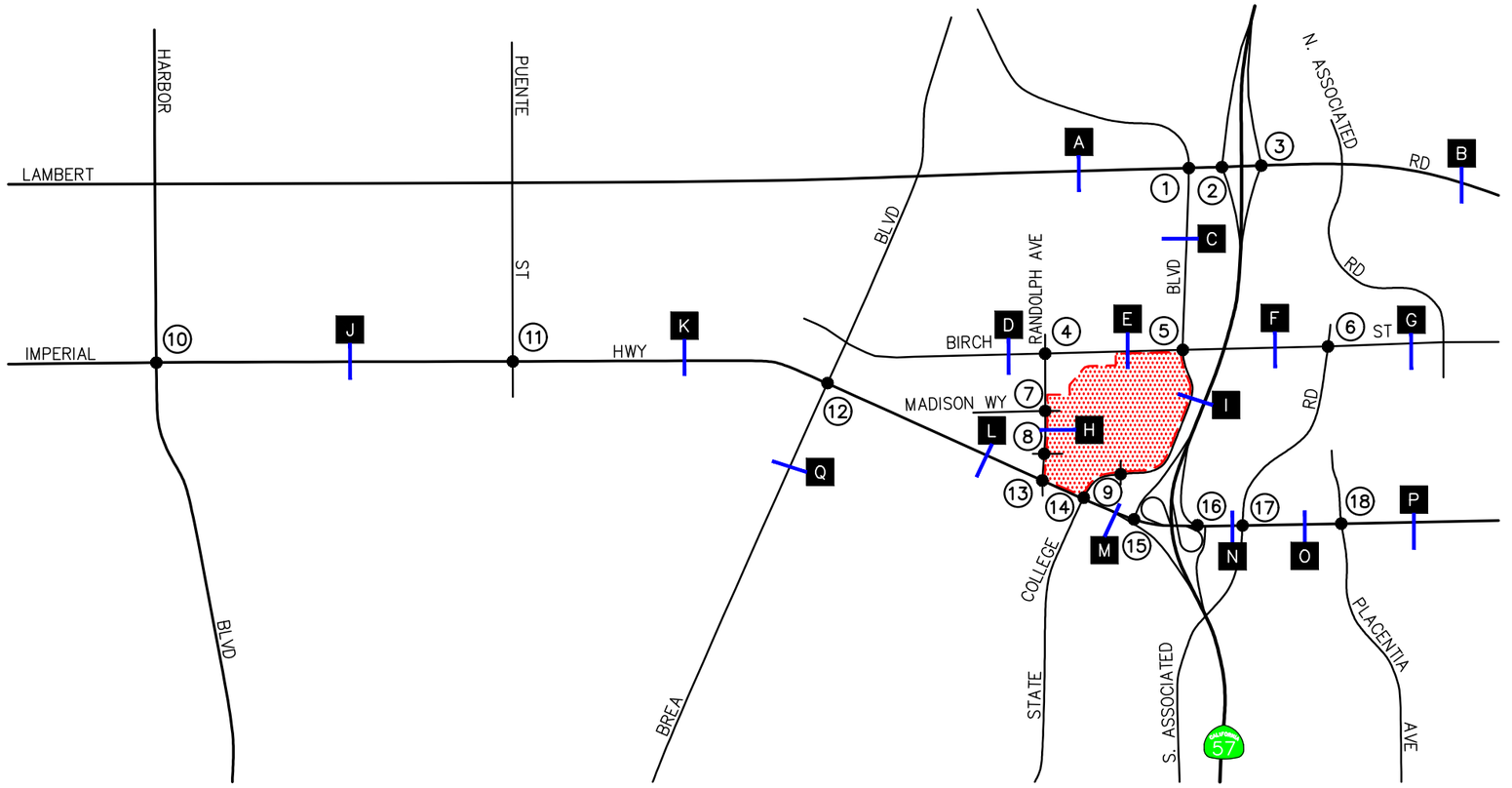
## YEAR 2045 WEEKDAY PM PEAK HOUR AND DAILY TRAFFIC VOLUMES WITH PROJECT

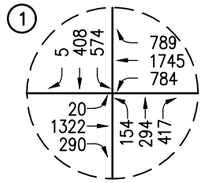
BREA MALL EXPANSION & IMPORVEMENTS, BREA



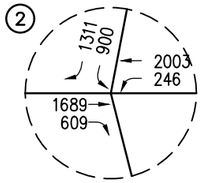
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| LOCATION | VOLUME |
|---|---|
| A | 49,936 |
| B | 44,402 |
| C | 28,129 |
| D | 23,647 |
| E | 22,566 |
| F | 31,466 |
| G | 30,580 |
| H | 10,045 |
| I | 17,669 |
| J | 54,433 |
| K | 69,842 |
| L | 66,995 |
| M | 89,624 |
| N | 66,186 |
| O | 64,800 |
| P | 64,031 |
| Q | 37,473 |

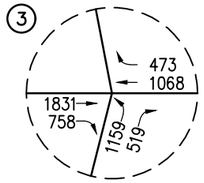


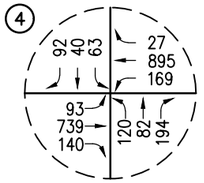
STATE COLLEGE BLVD @ LAMBERT RD



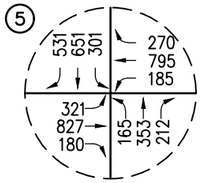
SR-57 SB RAMPS @ LAMBERT RD



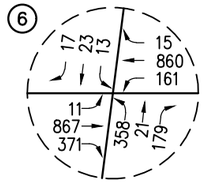
SR-57 NB RAMPS @ LAMBERT RD



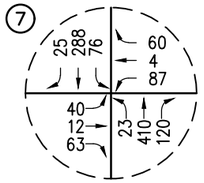
RANDOLPH AVE @ BIRCH ST



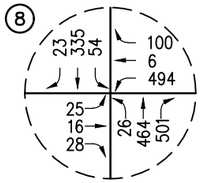
STATE COLLEGE BLVD @ BIRCH ST



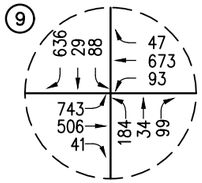
S. ASSOCIATED RD @ BIRCH ST



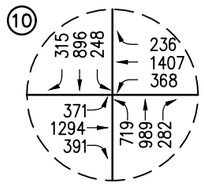
RANDOLPH AVE @ MADISON WAY



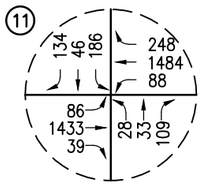
RANDOLPH AVE @ BREA MALL



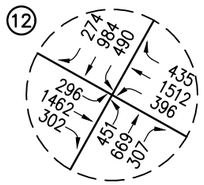
BREA MALL SOUTH @ STATE COLLEGE BLVD



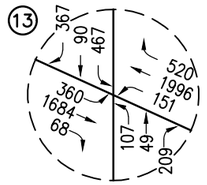
HARBOR BLVD @ IMPERIAL HWY



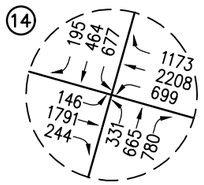
PUENTE ST @ IMPERIAL HWY



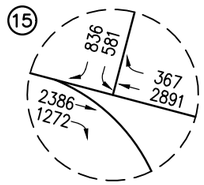
BREA BLVD @ IMPERIAL HWY



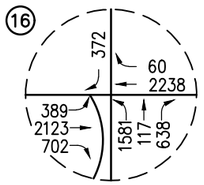
RANDOLPH AVE @ IMPERIAL HWY



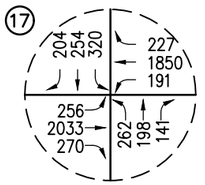
STATE COLLEGE BLVD @ IMPERIAL HWY



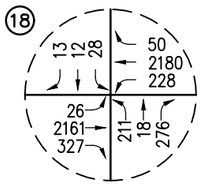
SR-57 SB RAMPS @ IMPERIAL HWY



SR-57 NB RAMPS @ IMPERIAL HWY



ASSOCIATED RD @ IMPERIAL HWY



CASTLEGATE LN/PLACENTIA AVE @ IMPERIAL HWY

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

[#] = STUDY ROADWAY SEGMENT

= BREA MALL

# FIGURE 6-16

## YEAR 2045 WEEKEND (SATURDAY) MIDDAY PEAK HOUR AND DAILY TRAFFIC VOLUMES WITH PROJECT

BREA MALL EXPANSION & IMPORVEMENTS, BREA

# 7.0 TRAFFIC ANALYSIS METHODOLOGY

The relative implications of the proposed Project added traffic volumes during the weekday AM peak hour and PM peak hour and weekend (Saturday) Midday peak hour was evaluated based on analysis of future operating conditions at the eighteen (18) key study intersections, without, then with, the proposed Project. The previously discussed capacity analysis procedures were utilized to investigate the future volume-to-capacity relationships and service level characteristics at each study intersection. The significance of the potential degradation to the service level at each key intersection due to the Project was then evaluated using the following traffic criteria.

## 7.1 LOS Criteria and Thresholds

### 7.1.1 *City of Brea*

For the ICU analysis, the need for potential Project-related improvements will be assessed based on the following criteria:

- The Project causes an intersection operating at LOS D or better to degrade to LOS E or F, or
- The Project increases traffic demand at a signalized study intersection by 0.020 or greater and the intersection is forecast to operate at LOS E or F.

For the HCM analysis, the need for potential Project-related improvements will be assessed based on the following criteria:

- The Project causes one or more study intersections operating at LOS D or better to degrade to LOS E or F, or
- The Project causes a change in control delay of 4 seconds for intersections already operating at LOS E, or
- The Project causes a change in control delay of 2 seconds for intersections already operating at LOS F.

### 7.1.2 *City of La Habra*

For the ICU analysis, LOS D is the acceptable condition that should be maintained during the morning and evening peak commute hours on all intersections within the City of La Habra, except those on the CMPHS of Orange County, where LOS E is defined in the CMP for Orange County as the acceptable limit and is acceptable for State Highway intersections. However, LOS D is considered acceptable at the intersection of Harbor Boulevard at Imperial Highway in order to be conservative. A degraded intersection service level is considered to be significant if the Project causes an intersection to degrade to LOS E or F, or if the Project increases traffic demand at a signalized study intersection by 0.010 or greater and the intersection is forecast to operate at LOS E or F.

### 7.1.3 *City of Fullerton*

The City of Fullerton considers a degraded intersection service level to be significant if the project causes an intersection at LOS D or better to degrade to LOS E or F. Per the City of Fullerton traffic study guidelines, peak hour intersection operating conditions were evaluated using the *Highway Capacity Manual* (HCM) Operations methodology.

## 7.2 Traffic Analysis Scenarios

The following scenarios are those for which volume/capacity calculations have been performed at the eighteen (18) key intersections for existing plus project, near-term (Year 2026) and long-term (Year 2045) traffic conditions:

1. Existing Baseline (Existing + Fully Occupied Mall) Traffic Conditions;
2. Scenario (2) with Recommended Improvements, if necessary;
3. Near-Term (Year 2026) Background Traffic Conditions (Existing plus Ambient Growth plus Related Projects);
4. Near-Term (Year 2026) Background Plus Project Traffic Conditions;
5. Scenario (5) with improvements to be implemented as conditions of approval (COA), if necessary;
6. Long-Term Buildout Traffic Conditions;
7. Long-Term Buildout Plus Project Traffic Conditions; and
8. Scenario (8) with improvements to be implemented as conditions of approval (COA), if necessary.

## 7.3 City of Brea Nexus Program

To satisfy the AB 1600 legislative requirement, development fees have been established to fund future traffic improvements within the City of Brea. Ensuring that every development project contributes a fair share of transportation improvements in the community, the City has introduced the "Transportation Improvement Nexus Program". In 2011, the Nexus Program was updated to reflect transportation needs and incorporate capacity improvements in an orderly fashion. The program ensures all future development with the City of Brea contributes on a fair share basis.

# 8.0 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

## 8.1 Year 2026 Traffic Conditions - ICU

***Table 8-1*** summarizes the peak hour Level of Service results at the eighteen (18) key study intersections evaluated under ICU analysis for the Year 2026 horizon year. The first column (1) of ICU/LOS values in *Table 8-1* presents a summary of existing Weekday AM, Weekday PM, and Weekend (Saturday) Midday peak hour traffic conditions. The second column (2) lists projected cumulative traffic conditions (existing plus ambient plus related projects traffic) based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents forecast Year 2026 near-term traffic conditions with the addition of Project traffic. The fourth column (4) shows the increase in ICU value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will exceed the LOS thresholds mentioned in this report. The fifth column (5) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

It should be noted that the intersections of SR-57 SB Ramps at Lambert Road and SR-57 NB Ramps at Lambert Road include planned SR-57 Lambert Road Interchange project improvements.

### 8.1.1 *Year 2026 Cumulative Traffic Conditions - ICU*

An analysis of future (Year 2026) background traffic conditions indicates that one (1) of the eighteen (18) key study intersections is forecast to operate at unacceptable levels of service during the Weekday AM, Weekday PM, and/or Weekend (Saturday) Midday peak hours under ICU analysis. The remaining seventeen (17) key study intersections are forecast to continue to operate at an acceptable LOS D or better based on the LOS criteria identified in this report. The locations identified below are forecast to operate at unacceptable levels of service:

| | | | | | **Weekend** | |
|---|---|---|---|---|---|---|
| | **AM Peak Hour** | | **PM Peak Hour** | | **Midday Peak Hour** | |
| **Key Intersection** | **ICU** | **LOS** | **ICU** | **LOS** | **ICU** | **LOS** |
| 14. State College Boulevard at Imperial Highway | -- | -- | 0.937 | E | 1.185 | F |

### 8.1.2 *Year 2026 Cumulative Plus Project Conditions - ICU*

Review of columns (3) and (4) of *Table 8-1* indicates that one (1) of the eighteen (18) key study intersections will continue to operate at unacceptable levels of services during the Weekday PM peak hour and Weekend (Saturday) Midday peak hour when compared to the LOS standards specified in this report. The intersections forecast to operate adversely are as follows:

| | | | | | Weekend | |
|---|---|---|---|---|---|---|
| | AM Peak Hour | | PM Peak Hour | | Midday Peak Hour | |
| **Key Intersection** | **ICU** | **LOS** | **ICU** | **LOS** | **ICU** | **LOS** |
| 14. State College Boulevard at Imperial Highway | -- | -- | 0.948 | E | 1.219 | F |

However, as shown in column (5) of *Table 8-1*, the implementation of recommended improvements at the intersection offsets the effect to LOS due to added Project-related traffic volumes. After implementation of the recommended improvements at the intersection are forecast to operate at better service levels than pre-Project conditions.

*Appendix C* also presents the near-term ICU/LOS calculations for the eighteen (18) key study intersections.

## TABLE 8-1

## YEAR 2026 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - ICU

| Study Intersection | Minimum Acceptable LOS | Time Period | (1) Existing Traffic Conditions | | (2) Year 2026 Traffic Conditions | | (3) Year 2026 Plus Project Traffic Conditions | | (4) Exceed LOS Thresholds | | (5) Year 2026 Plus Project with Improvements Traffic Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ICU | LOS | ICU | LOS | ICU | LOS | Increase | Yes/No | ICU | LOS |
| 1. State College Boulevard at Lambert Road | D | AM | 0.703 | C | 0.784 | C | 0.788 | C | 0.004 | No | -- | -- |
| | | PM | 0.676 | B | 0.787 | C | 0.792 | C | 0.005 | No | -- | -- |
| | | Sat MD | 0.679 | B | 0.781 | C | 0.785 | C | 0.004 | No | -- | -- |
| 2. SR-57 SB Ramps at Lambert Road | D | AM | 0.749 | C | 0.810 | D | 0.812 | D | 0.002 | No | -- | -- |
| | | PM | 0.614 | B | 0.671 | B | 0.674 | B | 0.003 | No | -- | -- |
| | | Sat MD | 0.730 | C | 0.785 | C | 0.786 | C | 0.001 | No | -- | -- |
| 3. SR-57 NB Ramps at Lambert Road | D | AM | 0.820 | D | 0.869 | D | 0.869 | D | 0.000 | No | -- | -- |
| | | PM | 0.568 | A | 0.571 | A | 0.572 | A | 0.001 | No | -- | -- |
| | | Sat MD | 0.686 | B | 0.729 | C | 0.731 | C | 0.002 | No | -- | -- |
| 4. Randolph Avenue at Birch Street | D | AM | 0.352 | A | 0.385 | A | 0.390 | A | 0.005 | No | -- | -- |
| | | PM | 0.566 | A | 0.611 | B | 0.614 | B | 0.003 | No | -- | -- |
| | | Sat MD | 0.468 | A | 0.529 | A | 0.532 | A | 0.003 | No | -- | -- |
| 5. State College Boulevard at Birch Street[36] | D | AM | 0.529 | A | 0.609 | B | 0.611 | B | 0.002 | No | -- | -- |
| | | PM | 0.673 | B | 0.783 | C | 0.788 | C | 0.005 | No | -- | -- |
| | | Sat MD | 0.633 | B | 0.729 | C | 0.731 | C | 0.002 | No | -- | -- |

Notes:

- **Bold ICU/LOS** values indicate adverse service levels based on the City LOS standards.

[36] It should be noted the southbound approach at the intersection has recently been widened to accommodate an exclusive right-turn lane. The level of service analysis presented in this report does not include this recent improvement, however, it is anticipated that the intersection would continue to operate at similar, if not better, service levels as presented herein with the inclusion of the southbound right-turn lane.

## TABLE 8-1 (CONTINUED)
## YEAR 2026 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - ICU

| Study Intersection | Minimum Acceptable LOS | Time Period | (1) Existing Traffic Conditions | | (2) Year 2026 Traffic Conditions | | (3) Year 2026 Plus Project Traffic Conditions | | (4) Exceed LOS Thresholds | | (5) Year 2026 Plus Project with Improvements Traffic Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ICU | LOS | ICU | LOS | ICU | LOS | Increase | Yes/No | ICU | LOS |
| 6. S Associated Road at Birch Street | D | AM | 0.619 | B | 0.662 | B | 0.664 | B | 0.002 | No | -- | -- |
| | | PM | 0.619 | B | 0.667 | B | 0.668 | B | 0.001 | No | -- | -- |
| | | Sat MD | 0.514 | A | 0.559 | A | 0.561 | A | 0.002 | No | -- | -- |
| 7. Randolph Avenue at Madison Way | D | AM | 0.139 | A | 0.144 | A | 0.148 | A | 0.004 | No | -- | -- |
| | | PM | 0.243 | A | 0.252 | A | 0.254 | A | 0.002 | No | -- | -- |
| | | Sat MD | 0.291 | A | 0.302 | A | 0.307 | A | 0.005 | No | -- | -- |
| 8. Randolph Avenue at Brea Mall | D | AM | 0.136 | A | 0.143 | A | 0.198 | A | 0.055 | No | -- | -- |
| | | PM | 0.358 | A | 0.374 | A | 0.447 | A | 0.073 | No | -- | -- |
| | | Sat MD | 0.449 | A | 0.493 | A | 0.517 | A | 0.024 | No | -- | -- |
| 9. Brea Mall South at State College Boulevard | D | AM | 0.183 | A | 0.204 | A | 0.236 | A | 0.032 | No | -- | -- |
| | | PM | 0.442 | A | 0.470 | A | 0.492 | A | 0.022 | No | -- | -- |
| | | Sat MD | 0.588 | A | 0.621 | B | 0.671 | B | 0.050 | No | -- | -- |
| 10. Harbor Boulevard at Imperial Highway | D[37] | AM | 0.790 | C | 0.840 | D | 0.842 | D | 0.002 | No | -- | -- |
| | | PM | 0.770 | C | 0.870 | D | 0.874 | D | 0.004 | No | -- | -- |
| | | Sat MD | 0.681 | B | 0.730 | C | 0.731 | C | 0.001 | No | -- | -- |

Notes:

- **Bold ICU/LOS** values indicate adverse service levels based on the City LOS standards.

[37] According to City of La Habra guidelines, LOS E is acceptable at this location but is shown as LOS D to be conservative.

## TABLE 8-1 (CONTINUED)
## YEAR 2026 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - ICU

| Study Intersection | Minimum Acceptable LOS | Time Period | (1) Existing Traffic Conditions | | (2) Year 2026 Traffic Conditions | | (3) Year 2026 Plus Project Traffic Conditions | | (4) Exceed LOS Thresholds | | (5) Year 2026 Plus Project with Improvements Traffic Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ICU | LOS | ICU | LOS | ICU | LOS | Increase | Yes/No | ICU | LOS |
| 11. Puente Street at Imperial Highway | D | AM | 0.573 | A | 0.651 | B | 0.659 | B | 0.008 | No | -- | -- |
| | | PM | 0.589 | A | 0.650 | B | 0.658 | B | 0.008 | No | -- | -- |
| | | Sat MD | 0.477 | A | 0.536 | A | 0.543 | A | 0.007 | No | -- | -- |
| 12. Brea Boulevard at Imperial Highway | D | AM | 0.787 | C | 0.865 | D | 0.870 | D | 0.005 | No | -- | -- |
| | | PM | 0.773 | C | 0.847 | D | 0.856 | D | 0.009 | No | -- | -- |
| | | Sat MD | 0.779 | C | 0.843 | D | 0.851 | D | 0.008 | No | -- | -- |
| 13. Randolph Avenue at Imperial Highway | D | AM | 0.420 | A | 0.484 | A | 0.512 | A | 0.028 | No | -- | -- |
| | | PM | 0.647 | B | 0.709 | C | 0.739 | C | 0.030 | No | -- | -- |
| | | Sat MD | 0.720 | C | 0.857 | D | 0.895 | D | 0.038 | No | -- | -- |
| 14. State College Boulevard at Imperial Highway | D | AM | 0.701 | C | 0.765 | C | 0.785 | C | 0.020 | No | 0.759 | C[38] |
| | | PM | 0.862 | D | **0.937** | **E** | **0.948** | **E** | 0.011 | No | 0.853 | D[38] |
| | | Sat MD | **1.092** | **F** | **1.185** | **F** | **1.219** | **F** | **0.034** | **Yes** | **1.084** | **F[38]** |
| 15. SR-57 SB Ramps at Imperial Highway | D | AM | 0.575 | A | 0.655 | B | 0.668 | B | 0.013 | No | -- | -- |
| | | PM | 0.705 | C | 0.766 | C | 0.785 | C | 0.019 | No | -- | -- |
| | | Sat MD | 0.779 | C | 0.862 | D | 0.869 | D | 0.007 | No | -- | -- |

Notes:

- **Bold ICU/LOS** values indicate adverse service levels based on the City LOS standards.

[38] Please note that the recommended improvement at this intersection takes into consideration the on-ramp modifications and restriping the no. 3 eastbound through lane along Imperial Highway at the SR-57 SB On-Ramp to a shared through/right-turn lane. In the event that Caltrans does not proceed with this improvement, the intersection would result in the following levels of service: *AM Peak Hour = 0.785, LOS C; PM Peak Hour = 0.948, LOS E, Sat. Midday Peak Hour = 1.219, LOS F.*

## TABLE 8-1 (CONTINUED)
## YEAR 2026 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - ICU

| Study Intersection | Minimum Acceptable LOS | Time Period | (1) Existing Traffic Conditions | | (2) Year 2026 Traffic Conditions | | (3) Year 2026 Plus Project Traffic Conditions | | (4) Exceed LOS Thresholds | | (5) Year 2026 Plus Project with Improvements Traffic Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ICU | LOS | ICU | LOS | ICU | LOS | Increase | Yes/No | ICU | LOS |
| 16. SR-57 NB Ramps at Imperial Highway | D | AM | 0.570 | A | 0.618 | B | 0.627 | B | 0.009 | No | -- | -- |
| | | PM | 0.712 | C | 0.756 | C | 0.768 | C | 0.012 | No | -- | -- |
| | | Sat MD | 0.831 | D | 0.813 | D | 0.818 | D | 0.005 | No | -- | -- |
| 17. Associated Road at Imperial Highway | D | AM | 0.704 | C | 0.746 | C | 0.753 | C | 0.007 | No | -- | -- |
| | | PM | 0.780 | C | 0.834 | D | 0.838 | D | 0.004 | No | -- | -- |
| | | Sat MD | 0.713 | C | 0.774 | C | 0.782 | C | 0.008 | No | -- | -- |
| 18. Castlegate Lane/ Placentia Avenue at Imperial Highway | D | AM | 0.601 | B | 0.643 | B | 0.646 | B | 0.003 | No | -- | -- |
| | | PM | 0.699 | B | 0.753 | C | 0.754 | C | 0.001 | No | -- | -- |
| | | Sat MD | 0.675 | B | 0.732 | C | 0.736 | C | 0.004 | No | -- | -- |

Notes:
- **Bold ICU/LOS** values indicate adverse service levels based on the City LOS standards.

## 8.2 Year 2026 Traffic Conditions - HCM

***Table 8-2*** summarizes the peak hour Level of Service results at the eighteen (18) key study intersections evaluated under HCM analysis for the Year 2026 horizon year. The first column (1) of HCM/LOS values in *Table 8-2* presents a summary of existing Weekday AM, Weekday PM, and Weekend (Saturday) Midday peak hour traffic conditions. The second column (2) lists projected cumulative traffic conditions (existing plus ambient plus related projects traffic) based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents forecast Year 2026 near-term traffic conditions with the addition of Project traffic. The fourth column (4) shows the increase in delay due to the added peak hour Project trips and indicates whether the traffic associated with the Project will exceed the LOS thresholds mentioned in this report. The fifth column (5) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

It should be noted that the intersections of SR-57 SB Ramps at Lambert Road and SR-57 NB Ramps at Lambert Road include planned SR-57 Lambert Road Interchange project improvements.

### 8.2.1 *Year 2026 Cumulative Traffic Conditions - HCM*

An analysis of future (Year 2026) background traffic conditions indicates that one (1) of the eighteen (18) key study intersections is forecast to operate at unacceptable levels of service during the Weekday AM, Weekday PM, and/or Weekend (Saturday) Midday peak hours under HCM analysis. The remaining seventeen (17) key study intersections are forecast to continue to operate at acceptable LOS based on the LOS criteria defined in this report. The locations identified below are forecast to operate at unacceptable levels of service:

| | AM Peak Hour | | PM Peak Hour | | Weekend Midday Peak Hour | |
|---|---|---|---|---|---|---|
| **Key Intersection** | **Delay (sec/veh)** | **LOS** | **Delay (sec/veh)** | **LOS** | **Delay (sec/veh)** | **LOS** |
| 14. State College Boulevard at Imperial Highway | -- | -- | 62.6 | E | 148.2 | F |

### 8.2.2 *Year 2026 Cumulative Plus Project Conditions - HCM*

Review of columns (3) and (4) of *Table 8-2* indicates that one (1) of the eighteen (18) key study intersections will continue to operate at unacceptable levels of services during the Weekday PM peak hour and Weekend (Saturday) Midday peak hour when compared to the LOS standards specified in this report. The intersections forecast to operate adversely are as follows:

| | AM Peak Hour | | PM Peak Hour | | Weekend Midday Peak Hour | |
|---|---|---|---|---|---|---|
| **Key Intersection** | **Delay (sec/veh)** | **LOS** | **Delay (sec/veh)** | **LOS** | **Delay (sec/veh)** | **LOS** |
| 14. State College Boulevard at Imperial Highway | -- | -- | 67.4 | E | 165.2 | F |

However, as shown in column (5) of *Table 8-2*, the implementation of recommended improvements at the intersection offsets the Project's increment. After implementation of the recommended improvements at the intersection are forecast to operate at better service levels than pre-Project conditions.

*Appendix D* also presents the near-term HCM/LOS calculations for the eighteen (18) key study intersections.

## TABLE 8-2

## YEAR 2026 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - HCM

| Study Intersection | Minimum Acceptable LOS | Time Period | (1) Existing Traffic Conditions | | (2) Year 2026 Traffic Conditions | | (3) Year 2026 Plus Project Traffic Conditions | | (4) Exceed LOS Thresholds | | (5) Year 2026 Plus Project with Improvements Traffic Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Delay (s/v) | LOS | Delay (s/v) | LOS | Delay (s/v) | LOS | Increase | Yes/No | Delay (s/v) | LOS |
| 1. State College Boulevard at Lambert Road | D | AM | 34.0 | C | 37.5 | D | 37.7 | D | 0.2 | No | -- | -- |
| | | PM | 36.3 | D | 42.1 | D | 42.2 | D | 0.1 | No | -- | -- |
| | | Sat MD | 35.7 | D | 44.6 | D | 45.1 | D | 0.5 | No | -- | -- |
| 2. SR-57 SB Ramps at Lambert Road | D | AM | 27.1 | C | 29.0 | C | 29.1 | C | 0.1 | No | -- | -- |
| | | PM | 19.5 | B | 19.8 | B | 19.8 | B | 0.0 | No | -- | -- |
| | | Sat MD | 25.1 | C | 26.2 | C | 29.1 | C | 2.9 | No | -- | -- |
| 3. SR-57 NB Ramps at Lambert Road | D | AM | 28.0 | C | 27.0 | C | 27.1 | C | 0.1 | No | -- | -- |
| | | PM | 19.9 | B | 15.0 | B | 15.0 | B | 0.0 | No | -- | -- |
| | | Sat MD | 24.9 | C | 19.1 | B | 19.2 | B | 0.1 | No | -- | -- |
| 4. Randolph Avenue at Birch Street | D | AM | 14.2 | B | 14.1 | B | 14.4 | B | 0.3 | No | -- | -- |
| | | PM | 30.1 | C | 30.7 | C | 32.1 | C | 1.4 | No | -- | -- |
| | | Sat MD | 20.0 | C | 19.7 | B | 20.0 | B | 0.3 | No | -- | -- |
| 5. State College Boulevard at Birch Street[39] | D | AM | 37.6 | D | 40.6 | D | 40.7 | D | 0.1 | No | -- | -- |
| | | PM | 30.6 | C | 35.5 | D | 35.9 | D | 0.4 | No | -- | -- |
| | | Sat MD | 37.3 | D | 41.3 | D | 41.3 | D | 0.0 | No | -- | -- |

Notes:

- **Bold HCM/LOS** values indicate adverse service levels based on the City LOS standards.
- s/v = seconds per vehicle (delay)

[39] It should be noted the southbound approach at the intersection has recently been widened to accommodate an exclusive right-turn lane. The level of service analysis presented in this report does not include this recent improvement, however, it is anticipated that the intersection would continue to operate at similar, if not better, service levels as presented herein with the inclusion of the southbound right-turn lane.

## TABLE 8-2 (CONTINUED)
## YEAR 2026 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - HCM

| Study Intersection | Minimum Acceptable LOS | Time Period | (1) Existing Traffic Conditions | | (2) Year 2026 Traffic Conditions | | (3) Year 2026 Plus Project Traffic Conditions | | (4) Exceed LOS Thresholds | | (5) Year 2026 Plus Project with Improvements Traffic Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Delay (s/v) | LOS | Delay (s/v) | LOS | Delay (s/v) | LOS | Increase | Yes/No | Delay (s/v) | LOS |
| 6. S Associated Road at Birch Street | D | AM | 26.1 | C | 28.3 | C | 28.4 | C | 0.1 | No | -- | -- |
| | | PM | 25.6 | C | 28.2 | C | 28.5 | C | 0.3 | No | -- | -- |
| | | Sat MD | 22.3 | C | 21.2 | C | 21.2 | C | 0.0 | No | -- | -- |
| 7. Randolph Avenue at Madison Way | D | AM | 17.3 | B | 17.0 | B | 16.3 | B | 0.0[40] | No | -- | -- |
| | | PM | 19.0 | B | 18.8 | B | 18.5 | B | 0.0[40] | No | -- | -- |
| | | Sat MD | 20.5 | C | 20.7 | C | 20.4 | C | 0.0[40] | No | -- | -- |
| 8. Randolph Avenue at Brea Mall | D | AM | 8.2 | A | 8.0 | A | 17.3 | B | 9.3 | No | -- | -- |
| | | PM | 18.3 | B | 18.4 | B | 19.4 | B | 1.0 | No | -- | -- |
| | | Sat MD | 22.7 | C | 23.6 | C | 26.0 | C | 2.4 | No | -- | -- |
| 9. Brea Mall South at State College Boulevard | D | AM | 15.6 | B | 15.4 | B | 20.3 | C | 4.9 | No | -- | -- |
| | | PM | 30.7 | C | 30.3 | C | 31.2 | C | 0.9 | No | -- | -- |
| | | Sat MD | 32.8 | C | 32.8 | C | 33.6 | C | 0.8 | No | -- | -- |
| 10. Harbor Boulevard at Imperial Highway | D[41] | AM | 40.4 | D | 45.1 | D | 46.2 | D | 1.1 | No | -- | -- |
| | | PM | 41.7 | D | 47.2 | D | 47.5 | D | 0.3 | No | -- | -- |
| | | Sat MD | 38.7 | D | 39.9 | D | 39.9 | D | 0.0 | No | -- | -- |

Notes:

- **Bold HCM/LOS** values indicate adverse service levels based on the City LOS standards.
- s/v = seconds per vehicle (delay)

[40] Theoretical negative increase, which is possible with HCM calculations, are denoted as an increase of 0.0 s/v.

[41] According to City of La Habra guidelines, LOS E is acceptable at this location but is shown as LOS D to be conservative.

## TABLE 8-2 (CONTINUED)
## YEAR 2026 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - HCM

| Study Intersection | Minimum Acceptable LOS | Time Period | (1) Existing Traffic Conditions | | (2) Year 2026 Traffic Conditions | | (3) Year 2026 Plus Project Traffic Conditions | | (4) Exceed LOS Thresholds | | (5) Year 2026 Plus Project with Improvements Traffic Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Delay (s/v) | LOS | Delay (s/v) | LOS | Delay (s/v) | LOS | Increase | Yes/No | Delay (s/v) | LOS |
| 11. Puente Street at Imperial Highway | D | AM | 18.1 | B | 20.2 | C | 20.6 | C | 0.4 | No | -- | -- |
| | | PM | 18.5 | B | 19.0 | B | 19.2 | B | 0.2 | No | -- | -- |
| | | Sat MD | 13.0 | B | 14.1 | B | 14.2 | B | 0.1 | No | -- | -- |
| 12. Brea Boulevard at Imperial Highway | D | AM | 40.2 | D | 46.8 | D | 48.0 | D | 1.2 | No | -- | -- |
| | | PM | 37.5 | D | 41.6 | D | 42.0 | D | 0.4 | No | -- | -- |
| | | Sat MD | 40.3 | D | 48.1 | D | 49.6 | D | 1.5 | No | -- | -- |
| 13. Randolph Avenue at Imperial Highway | D | AM | 12.4 | B | 14.4 | B | 16.6 | B | 2.2 | No | -- | -- |
| | | PM | 23.4 | C | 25.8 | C | 28.4 | C | 2.6 | No | -- | -- |
| | | Sat MD | 36.2 | D | 45.3 | D | 52.9 | D | 7.6 | No | -- | -- |
| 14. State College Boulevard at Imperial Highway | D | AM | 30.4 | C | 34.8 | C | 36.0 | C | 1.2 | No | 34.1 | C[42] |
| | | PM | **56.0** | **E** | **62.6** | **E** | **67.4** | **E** | **4.8** | **Yes** | 45.0 | D[42] |
| | | Sat MD | **112.0** | **F** | **148.2** | **F** | **165.2** | **F** | **17.0** | **Yes** | **108.6** | **F[42]** |
| 15. SR-57 SB Ramps at Imperial Highway | D | AM | 15.3 | B | 16.1 | B | 16.2 | B | 0.1 | No | -- | -- |
| | | PM | 15.9 | B | 16.9 | B | 17.3 | B | 0.4 | No | -- | -- |
| | | Sat MD | 17.5 | B | 20.8 | C | 21.1 | C | 0.3 | No | -- | -- |

Notes:

- **Bold HCM/LOS** values indicate adverse service levels based on the City LOS standards.
- s/v = seconds per vehicle (delay)

[42] Please note that the recommended improvement at this intersection takes into consideration the on-ramp modifications and restriping the no. 3 eastbound through lane along Imperial Highway at the SR-57 SB On-Ramp to a shared through/right-turn lane. In the event that Caltrans does not proceed with this improvement, the intersection would result in the following levels of service: *AM Peak Hour = 36.0 s/v, LOS C; PM Peak Hour = 67.3 s/v, LOS E, Sat. Midday Peak Hour = 165.0 s/v, LOS F.*

## TABLE 8-2 (CONTINUED)
## YEAR 2026 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - HCM

| Study Intersection | Minimum Acceptable LOS | Time Period | (1) Existing Traffic Conditions | | (2) Year 2026 Traffic Conditions | | (3) Year 2026 Plus Project Traffic Conditions | | (4) Exceed LOS Thresholds | | (5) Year 2026 Plus Project with Improvements Traffic Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Delay (s/v) | LOS | Delay (s/v) | LOS | Delay (s/v) | LOS | Increase | Yes/No | Delay (s/v) | LOS |
| 16. SR-57 NB Ramps at Imperial Highway | D | AM | 21.2 | C | 22.4 | C | 22.6 | C | 0.2 | No | -- | -- |
| | | PM | 22.5 | C | 22.9 | C | 23.5 | C | 0.6 | No | -- | -- |
| | | Sat MD | 36.5 | D | 34.0 | C | 34.0 | C | 0.0 | No | -- | -- |
| 17. Associated Road at Imperial Highway | D | AM | 27.2 | C | 32.5 | C | 32.7 | C | 0.2 | No | -- | -- |
| | | PM | 40.7 | D | 46.2 | D | 46.3 | D | 0.1 | No | -- | -- |
| | | Sat MD | 34.5 | C | 35.6 | D | 37.3 | D | 1.7 | No | -- | -- |
| 18. Castlegate Lane/ Placentia Avenue at Imperial Highway | D | AM | 18.1 | B | 19.1 | B | 19.2 | B | 0.1 | No | -- | -- |
| | | PM | 24.0 | C | 26.7 | C | 26.9 | C | 0.2 | No | -- | -- |
| | | Sat MD | 20.8 | C | 23.4 | C | 23.6 | C | 0.2 | No | -- | -- |

Notes:

- **Bold HCM/LOS** values indicate adverse service levels based on the City LOS standards.
- s/v = seconds per vehicle (delay)

## 8.3 Year 2045 Traffic Conditions - ICU

***Table 8-3*** summarizes the peak hour Level of Service results at the eighteen (18) key study intersections evaluated under ICU analysis for the Year 2045. The first column (1) of ICU/LOS values in *Table 8-3* presents a summary of existing Weekday AM, Weekday PM, and Weekend (Saturday) Midday peak hour traffic conditions. The second column (2) lists projected Year 2045 long-term traffic conditions based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents forecast Year 2045 long-term traffic conditions with the addition of Project traffic. The fourth column (4) shows the increase in ICU value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will exceed the LOS standards defined in this report. The fifth column (5) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

It should be noted that the intersections of SR-57 SB Ramps at Lambert Road and SR-57 NB Ramps at Lambert Road include planned SR-57 Lambert Road Interchange project improvements.

### 8.3.1 *Year 2045 Traffic Conditions - ICU*

An analysis of long-term (Year 2045) background traffic conditions indicates that five (5) of the eighteen (18) key study intersections is forecast to operate at unacceptable levels of service during the Weekday AM, Weekday PM, and/or Weekend (Saturday) Midday peak hours under ICU analysis. The remaining thirteen (13) key study intersections are forecast to continue to operate at an acceptable LOS D or better based on the LOS criteria identified in this report. The locations identified below are forecast to operate at unacceptable levels of service:

| | AM Peak Hour | | PM Peak Hour | | Weekend Midday Peak Hour | |
|---|---|---|---|---|---|---|
| **Key Intersection** | **ICU** | **LOS** | **ICU** | **LOS** | **ICU** | **LOS** |
| 10. Harbor Boulevard at Imperial Highway | 1.026 | F | 1.022 | F | -- | -- |
| 12. Brea Boulevard at Imperial Highway | 0.947 | E | -- | -- | -- | -- |
| 14. State College Boulevard at Imperial Highway | -- | -- | 1.028 | F | 1.318 | F |
| 16. SR-57 NB Ramps at Imperial Highway | -- | -- | -- | -- | 0.955 | E |
| 17. Associated Road at Imperial Highway | -- | -- | 0.935 | E | -- | -- |

### 8.3.2 *Year 2045 Plus Project Traffic Conditions - ICU*

Review of columns (3) and (4) of *Table 8-3* indicates that five (5) of the eighteen (18) key study intersections will continue to operate at unacceptable levels of services during the Weekday PM peak hour and Weekend (Saturday) Midday peak hour when compared to the LOS standards specified in this report. The intersections forecast to operate adversely are as follows:

| | | | | | Weekend | |
|---|---|---|---|---|---|---|
| | AM Peak Hour | | PM Peak Hour | | Midday Peak Hour | |
| Key Intersection | ICU | LOS | ICU | LOS | ICU | LOS |
| 10. Harbor Boulevard at Imperial Highway | 1.026 | F | 1.026 | F | -- | -- |
| 12. Brea Boulevard at Imperial Highway | 0.952 | E | -- | -- | -- | -- |
| 14. State College Boulevard at Imperial Highway | -- | -- | 1.040 | F | 1.352 | F |
| 16. SR-57 NB Ramps at Imperial Highway | -- | -- | -- | -- | 0.960 | F |
| 17. Associated Road at Imperial Highway | -- | -- | 0.940 | E | -- | -- |

However, as shown in column (5) of *Table 8-3*, implementation of recommended improvements at the intersections of State College Blvd at Imperial Highway (Intersection #14) offsets the Project's increment. After implementation of the recommended improvements, the intersection is forecast to operate at better service levels than pre-Project conditions. It should be noted that the intersection of Harbor Blvd at Imperial Highway (Intersection #10), Brea Blvd at Imperial Highway (Intersection #12), SR-57 NB Ramps at Imperial (intersection #16) and Associated Road at Imperial Highway (Intersection #17) does not satisfy the criteria defined in this report to require improvements.

*Appendix C* presents the long-term ICU/LOS calculations for the eighteen (18) key study intersections.

## TABLE 8-3

## YEAR 2045 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - ICU

| Study Intersection | Minimum Acceptable LOS | Time Period | (1) Existing Traffic Conditions | | (2) Year 2045 Traffic Conditions | | (3) Year 2045 Plus Project Traffic Conditions | | (4) Exceed LOS Thresholds | | (5) Year 2045 Plus Project with Improvements Traffic Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ICU | LOS | ICU | LOS | ICU | LOS | Increase | Yes/No | ICU | LOS |
| 1. State College Boulevard at Lambert Road | D | AM | 0.703 | C | 0.867 | D | 0.871 | D | 0.004 | No | -- | -- |
| | | PM | 0.676 | B | 0.863 | D | 0.868 | D | 0.005 | No | -- | -- |
| | | Sat MD | 0.679 | B | 0.822 | D | 0.826 | D | 0.004 | No | -- | -- |
| 2. SR-57 SB Ramps at Lambert Road | D | AM | 0.749 | C | 0.834 | D | 0.836 | D | 0.002 | No | -- | -- |
| | | PM | 0.614 | B | 0.689 | B | 0.692 | B | 0.003 | No | -- | -- |
| | | Sat MD | 0.730 | C | 0.837 | D | 0.839 | D | 0.002 | No | -- | -- |
| 3. SR-57 NB Ramps at Lambert Road | D | AM | 0.820 | D | 0.885 | D | 0.885 | D | 0.000 | No | -- | -- |
| | | PM | 0.568 | A | 0.588 | A | 0.588 | A | 0.000 | No | -- | -- |
| | | Sat MD | 0.686 | B | 0.770 | C | 0.772 | C | 0.002 | No | -- | -- |
| 4. Randolph Avenue at Birch Street | D | AM | 0.352 | A | 0.430 | A | 0.435 | A | 0.005 | No | -- | -- |
| | | PM | 0.566 | A | 0.643 | B | 0.647 | B | 0.004 | No | -- | -- |
| | | Sat MD | 0.468 | A | 0.556 | A | 0.559 | A | 0.003 | No | -- | -- |
| 5. State College Boulevard at Birch Street[43] | D | AM | 0.529 | A | 0.670 | B | 0.673 | B | 0.003 | No | -- | -- |
| | | PM | 0.673 | B | 0.860 | D | 0.864 | D | 0.004 | No | -- | -- |
| | | Sat MD | 0.633 | B | 0.772 | C | 0.774 | C | 0.002 | No | -- | -- |

Notes:

- **Bold ICU/LOS** values indicate adverse service levels based on the City LOS standards.

[43] It should be noted the southbound approach at the intersection has recently been widened to accommodate an exclusive right-turn lane. The level of service analysis presented in this report does not include this recent improvement, however, it is anticipated that the intersection would continue to operate at similar, if not better, service levels as presented herein with the inclusion of the southbound right-turn lane.

## TABLE 8-3 (CONTINUED)
## YEAR 2045 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - ICU

| Study Intersection | Minimum Acceptable LOS | Time Period | (1) Existing Traffic Conditions | | (2) Year 2045 Traffic Conditions | | (3) Year 2045 Plus Project Traffic Conditions | | (4) Exceed LOS Thresholds | | (5) Year 2045 Plus Project with Improvements Traffic Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ICU | LOS | ICU | LOS | ICU | LOS | Increase | Yes/No | ICU | LOS |
| 6. S Associated Road at Birch Street | D | AM | 0.619 | B | 0.734 | C | 0.736 | C | 0.002 | No | -- | -- |
| | | PM | 0.619 | B | 0.740 | C | 0.741 | C | 0.001 | No | -- | -- |
| | | Sat MD | 0.514 | A | 0.589 | A | 0.590 | A | 0.001 | No | -- | -- |
| 7. Randolph Avenue at Madison Way | D | AM | 0.139 | A | 0.150 | A | 0.154 | A | 0.004 | No | -- | -- |
| | | PM | 0.243 | A | 0.268 | A | 0.270 | A | 0.002 | No | -- | -- |
| | | Sat MD | 0.291 | A | 0.341 | A | 0.346 | A | 0.005 | No | -- | -- |
| 8. Randolph Avenue at Brea Mall | D | AM | 0.136 | A | 0.148 | A | 0.203 | A | 0.055 | No | -- | -- |
| | | PM | 0.358 | A | 0.392 | A | 0.444 | A | 0.052 | No | -- | -- |
| | | Sat MD | 0.449 | A | 0.519 | A | 0.566 | A | 0.047 | No | -- | -- |
| 9. Brea Mall South at State College Boulevard | D | AM | 0.183 | A | 0.245 | A | 0.277 | A | 0.032 | No | -- | -- |
| | | PM | 0.442 | A | 0.491 | A | 0.512 | A | 0.021 | No | -- | -- |
| | | Sat MD | 0.588 | A | 0.650 | B | 0.700 | C | 0.050 | No | -- | -- |
| 10. Harbor Boulevard at Imperial Highway | D[44] | AM | 0.790 | C | **1.026** | **F** | **1.026** | **F** | 0.000 | No | -- | -- |
| | | PM | 0.770 | C | **1.022** | **F** | **1.026** | **F** | 0.004 | No | -- | -- |
| | | Sat MD | 0.681 | B | 0.884 | D | 0.885 | D | 0.001 | No | -- | -- |

Notes:

- **Bold ICU/LOS** values indicate adverse service levels based on the City LOS standards.

[44] According to City of La Habra guidelines, LOS E is acceptable at this location but is shown as LOS D to be conservative.

## TABLE 8-3 (CONTINUED)
## YEAR 2045 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - ICU

| Study Intersection | Minimum Acceptable LOS | Time Period | (1) Existing Traffic Conditions | | (2) Year 2045 Traffic Conditions | | (3) Year 2045 Plus Project Traffic Conditions | | (4) Exceed LOS Thresholds | | (5) Year 2045 Plus Project with Improvements Traffic Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ICU | LOS | ICU | LOS | ICU | LOS | Increase | Yes/No | ICU | LOS |
| 11. Puente Street at Imperial Highway | D | AM | 0.573 | A | 0.772 | C | 0.780 | C | 0.008 | No | -- | -- |
| | | PM | 0.589 | A | 0.704 | C | 0.712 | C | 0.008 | No | -- | -- |
| | | Sat MD | 0.477 | A | 0.558 | A | 0.565 | A | 0.007 | No | -- | -- |
| 12. Brea Boulevard at Imperial Highway | D | AM | 0.787 | C | **0.947** | **E** | **0.952** | **E** | 0.005 | No | -- | -- |
| | | PM | 0.773 | C | 0.879 | D | 0.889 | D | 0.010 | No | -- | -- |
| | | Sat MD | 0.779 | C | 0.867 | D | 0.875 | D | 0.008 | No | -- | -- |
| 13. Randolph Avenue at Imperial Highway | D | AM | 0.420 | A | 0.515 | A | 0.545 | A | 0.030 | No | -- | -- |
| | | PM | 0.647 | B | 0.734 | C | 0.765 | C | 0.031 | No | -- | -- |
| | | Sat MD | 0.720 | C | 0.854 | D | 0.892 | D | 0.038 | No | -- | -- |
| 14. State College Boulevard at Imperial Highway | D | AM | 0.701 | C | 0.837 | D | 0.857 | D | 0.020 | No | 0.826 | D[45] |
| | | PM | 0.862 | D | **1.028** | **F** | **1.040** | **F** | 0.012 | No | **0.941** | **E**[45] |
| | | Sat MD | **1.092** | **F** | **1.318** | **F** | **1.352** | **F** | **0.034** | **Yes** | **1.242** | **F**[45] |
| 15. SR-57 SB Ramps at Imperial Highway | D | AM | 0.575 | A | 0.719 | C | 0.732 | C | 0.013 | No | -- | -- |
| | | PM | 0.705 | C | 0.836 | D | 0.855 | D | 0.019 | No | -- | -- |
| | | Sat MD | 0.779 | C | 0.888 | D | 0.895 | D | 0.007 | No | -- | -- |

Notes:

- **Bold ICU/LOS** values indicate adverse service levels based on the City LOS standards.

[45] Please note that the recommended improvement at this intersection takes into consideration the on-ramp modifications and restriping the no. 3 eastbound through lane along Imperial Highway at the SR-57 SB On-Ramp to a shared through/right-turn lane. In the event that Caltrans does not proceed with this improvement, the intersection would result in the following levels of service: *AM Peak Hour = 0.857, LOS D; PM Peak Hour = 1.040, LOS F, Sat. Midday Peak Hour = 1.352, LOS F.*

## TABLE 8-3 (CONTINUED)
## YEAR 2045 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - ICU

| Study Intersection | Minimum Acceptable LOS | Time Period | (1) Existing Traffic Conditions | | (2) Year 2045 Traffic Conditions | | (3) Year 2045 Plus Project Traffic Conditions | | (4) Exceed LOS Thresholds | | (5) Year 2045 Plus Project with Improvements Traffic Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ICU | LOS | ICU | LOS | ICU | LOS | Increase | Yes/No | ICU | LOS |
| 16. SR-57 NB Ramps at Imperial Highway | D | AM | 0.570 | A | 0.672 | B | 0.682 | B | 0.010 | No | -- | -- |
| | | PM | 0.712 | C | 0.816 | D | 0.829 | D | 0.013 | No | -- | -- |
| | | Sat MD | 0.831 | D | **0.955** | **E** | **0.960** | **E** | 0.005 | No | -- | -- |
| 17. Associated Road at Imperial Highway | D | AM | 0.704 | C | 0.832 | D | 0.839 | D | 0.007 | No | -- | -- |
| | | PM | 0.780 | C | **0.935** | **E** | **0.940** | **E** | 0.005 | No | -- | -- |
| | | Sat MD | 0.713 | C | 0.833 | D | 0.840 | D | 0.007 | No | -- | -- |
| 18. Castlegate Lane/ Placentia Avenue at Imperial Highway | D | AM | 0.601 | B | 0.717 | C | 0.721 | C | 0.004 | No | -- | -- |
| | | PM | 0.699 | B | 0.842 | D | 0.844 | D | 0.002 | No | -- | -- |
| | | Sat MD | 0.675 | B | 0.783 | C | 0.787 | C | 0.004 | No | -- | -- |

Notes:
- **Bold ICU/LOS** values indicate adverse service levels based on the City LOS standards.

## 8.4 Year 2045 Traffic Conditions - HCM

***Table 8-4*** summarizes the peak hour Level of Service results at the eighteen (18) key study intersections evaluated under HCM analysis for the Year 2045. The first column (1) of HCM/LOS values in *Table 8-4* presents a summary of existing Weekday AM, Weekday PM, and Weekend (Saturday) Midday peak hour traffic conditions. The second column (2) lists projected Year 2045 long-term traffic conditions based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents forecast Year 2045 long-term traffic conditions with the addition of Project traffic. The fourth column (4) shows the increase in delay due to the added peak hour Project trips and indicates whether the traffic associated with the Project will exceed the LOS thresholds mentioned in this report. The fifth column (5) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

It should be noted that the intersections of SR-57 SB Ramps at Lambert Road and SR-57 NB Ramps at Lambert Road include planned SR-57 Lambert Road Interchange project improvements.

### 8.4.1 *Year 2045 Traffic Conditions - HCM*

Review of column (2) of *Table 8-4* shows that projected long-term (Year 2045) without Project traffic conditions indicates that two (2) of the eighteen (18) key study intersections are forecast to operate at unacceptable levels of service during the Weekday AM, Weekday PM, and/or Weekend (Saturday) Midday peak hours under HCM analysis. The remaining sixteen (16) key study intersections are forecast to continue to operate at acceptable LOS based on the LOS criteria defined in this report. The locations identified below are forecast to operate at unacceptable levels of service:

| | AM Peak Hour | | PM Peak Hour | | Weekend Midday Peak Hour | |
|---|---|---|---|---|---|---|
| **Key Intersection** | **Delay (sec/veh)** | **LOS** | **Delay (sec/veh)** | **LOS** | **Delay (sec/veh)** | **LOS** |
| 10. Harbor Boulevard at Imperial Highway | 57.6 | E | 69.8 | E | -- | -- |
| 14. State College Boulevard at Imperial Highway | -- | -- | 69.4 | E | 134.5 | F |

### 8.4.2 *Year 2045 Plus Project Traffic Conditions – HCM*

Review of columns (3) and (4) of *Table 8-4* indicates that two (2) of the eighteen (18) key study intersections will continue to operate at unacceptable levels of services during the Weekday PM peak hour and Weekend (Saturday) Midday peak hour when compared to the LOS standards specified in this report. The intersections forecast to operate adversely are as follows:

| | AM Peak Hour | | PM Peak Hour | | Weekend Midday Peak Hour | |
|---|---|---|---|---|---|---|
| **Key Intersection** | **Delay (sec/veh)** | **LOS** | **Delay (sec/veh)** | **LOS** | **Delay (sec/veh)** | **LOS** |
| 10. Harbor Boulevard at Imperial Highway | 58.2 | E | 70.0 | E | -- | -- |
| 14. State College Boulevard at Imperial Highway | -- | -- | 71.9 | E | 148.1 | F |

However, as shown in column (5) of *Table 8-6*, the implementation of recommended improvements at the intersection of State College Blvd at Imperial Highway (Intersection #14) offsets the Project's increment. After implementation of the recommended improvements at the intersection State College Blvd at Imperial Highway (Intersection #14) are forecast to operate at better service levels than pre-Project conditions. It should be noted that the intersection of Harbor Blvd at Imperial Highway (Intersection #10) does not satisfy the criteria defined in this report to require improvements.

*Appendix D* presents the long-term HCM/LOS calculations for the eighteen (18) key study intersections.

## TABLE 8-4

## YEAR 2045 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - HCM

| Study Intersection | Minimum Acceptable LOS | Time Period | (1) Existing Traffic Conditions | | (2) Year 2045 Traffic Conditions | | (3) Year 2045 Plus Project Traffic Conditions | | (4) Exceed LOS Thresholds | | (5) Year 2045 Plus Project with Improvements Traffic Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Delay (s/v) | LOS | Delay (s/v) | LOS | Delay (s/v) | LOS | Increase | Yes/No | Delay (s/v) | LOS |
| 1. State College Boulevard at Lambert Road | D | AM | 34.0 | C | 39.9 | D | 40.2 | D | 0.3 | No | -- | -- |
| | | PM | 36.3 | D | 41.9 | D | 44.0 | D | 2.1 | No | -- | -- |
| | | Sat MD | 35.7 | D | 48.2 | D | 49.3 | D | 1.1 | No | -- | -- |
| 2. SR-57 SB Ramps at Lambert Road | D | AM | 27.1 | C | 24.4 | C | 24.4 | C | 0.0 | No | -- | -- |
| | | PM | 19.5 | B | 19.3 | B | 19.4 | B | 0.1 | No | -- | -- |
| | | Sat MD | 25.1 | C | 30.2 | C | 30.2 | C | 0.0 | No | -- | -- |
| 3. SR-57 NB Ramps at Lambert Road | D | AM | 28.0 | C | 22.1 | C | 22.1 | C | 0.0 | No | -- | -- |
| | | PM | 19.9 | B | 13.6 | B | 13.6 | B | 0.0 | No | -- | -- |
| | | Sat MD | 24.9 | C | 19.5 | B | 19.5 | B | 0.0 | No | -- | -- |
| 4. Randolph Avenue at Birch Street | D | AM | 14.2 | B | 14.2 | B | 14.4 | B | 0.2 | No | -- | -- |
| | | PM | 30.1 | C | 21.8 | C | 22.6 | C | 0.8 | No | -- | -- |
| | | Sat MD | 20.0 | C | 18.9 | B | 19.1 | B | 0.2 | No | -- | -- |
| 5. State College Boulevard at Birch Street[46] | D | AM | 37.6 | D | 40.4 | D | 40.5 | D | 0.1 | No | -- | -- |
| | | PM | 30.6 | C | 37.7 | D | 38.1 | D | 0.4 | No | -- | -- |
| | | Sat MD | 37.3 | D | 41.0 | D | 41.7 | D | 0.7 | No | -- | -- |

Notes:

- **Bold HCM/LOS** values indicate adverse service levels based on the City LOS standards.
- s/v = seconds per vehicle (delay)

[46] It should be noted the southbound approach at the intersection has recently been widened to accommodate an exclusive right-turn lane. The level of service analysis presented in this report does not include this recent improvement, however, it is anticipated that the intersection would continue to operate at similar, if not better, service levels as presented herein with the inclusion of the southbound right-turn lane.

## TABLE 8-4 (CONTINUED)
## YEAR 2045 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - HCM

| Study Intersection | Minimum Acceptable LOS | Time Period | (1) Existing Traffic Conditions | | (2) Year 2045 Traffic Conditions | | (3) Year 2045 Plus Project Traffic Conditions | | (4) Exceed LOS Thresholds | | (5) Year 2045 Plus Project with Improvements Traffic Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Delay (s/v) | LOS | Delay (s/v) | LOS | Delay (s/v) | LOS | Increase | Yes/No | Delay (s/v) | LOS |
| 6. S Associated Road at Birch Street | D | AM | 26.1 | C | 26.8 | C | 26.8 | C | 0.0 | No | -- | -- |
| | | PM | 25.6 | C | 28.9 | C | 28.9 | C | 0.0 | No | -- | -- |
| | | Sat MD | 22.3 | C | 21.0 | C | 21.1 | C | 0.1 | No | -- | -- |
| 7. Randolph Avenue at Madison Way | D | AM | 17.3 | B | 15.2 | B | 14.5 | B | 0.0[47] | No | -- | -- |
| | | PM | 19.0 | B | 16.5 | B | 16.2 | B | 0.0[47] | No | -- | -- |
| | | Sat MD | 20.5 | C | 17.1 | B | 16.8 | B | 0.0[47] | No | -- | -- |
| 8. Randolph Avenue at Brea Mall | D | AM | 8.2 | A | 6.1 | A | 13.5 | B | 7.4 | No | -- | -- |
| | | PM | 18.3 | B | 17.4 | B | 18.3 | B | 0.9 | No | -- | -- |
| | | Sat MD | 22.7 | C | 21.8 | C | 24.4 | C | 2.6 | No | -- | -- |
| 9. Brea Mall South at State College Boulevard | D | AM | 15.6 | B | 12.8 | B | 17.1 | B | 4.3 | No | -- | -- |
| | | PM | 30.7 | C | 27.8 | C | 30.9 | C | 3.1 | No | -- | -- |
| | | Sat MD | 32.8 | C | 31.8 | C | 32.4 | C | 0.6 | No | -- | -- |
| 10. Harbor Boulevard at Imperial Highway | D[48] | AM | 40.4 | D | **57.6** | **E** | **58.2** | **E** | 0.6 | No | -- | -- |
| | | PM | 41.7 | D | **69.8** | **E** | **70.0** | **E** | 0.2 | No | -- | -- |
| | | Sat MD | 38.7 | D | 52.7 | D | 53.4 | D | 0.7 | No | -- | -- |

Notes:

- **Bold HCM/LOS** values indicate adverse service levels based on the City LOS standards.
- s/v = seconds per vehicle (delay)

[47] Theoretical negative increase, which is possible with HCM calculations, are denoted as an increase of 0.0 s/v.

[48] According to City of La Habra guidelines, LOS E is acceptable at this location but is shown as LOS D to be conservative.

## TABLE 8-4 (CONTINUED)

## YEAR 2045 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - HCM

| Study Intersection | Minimum Acceptable LOS | Time Period | (1) Existing Traffic Conditions | | (2) Year 2045 Traffic Conditions | | (3) Year 2045 Plus Project Traffic Conditions | | (4) Exceed LOS Thresholds | | (5) Year 2045 Plus Project with Improvements Traffic Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Delay (s/v) | LOS | Delay (s/v) | LOS | Delay (s/v) | LOS | Increase | Yes/No | Delay (s/v) | LOS |
| 11. Puente Street at Imperial Highway | D | AM | 18.1 | B | 21.1 | C | 21.2 | C | 0.1 | No | -- | -- |
| | | PM | 18.5 | B | 16.6 | B | 16.8 | B | 0.2 | No | -- | -- |
| | | Sat MD | 13.0 | B | 13.1 | B | 13.2 | B | 0.1 | No | -- | -- |
| 12. Brea Boulevard at Imperial Highway | D | AM | 40.2 | D | 46.8 | D | 46.9 | D | 0.1 | No | -- | -- |
| | | PM | 37.5 | D | 41.4 | D | 41.7 | D | 0.3 | No | -- | -- |
| | | Sat MD | 40.3 | D | 44.2 | D | 45.0 | D | 0.8 | No | -- | -- |
| 13. Randolph Avenue at Imperial Highway | D | AM | 12.4 | B | 13.2 | B | 15.1 | B | 1.9 | No | -- | -- |
| | | PM | 23.4 | C | 24.6 | C | 26.8 | C | 2.2 | No | -- | -- |
| | | Sat MD | 36.2 | D | 42.4 | D | 47.2 | D | 4.8 | No | -- | -- |
| 14. State College Boulevard at Imperial Highway | D | AM | 30.4 | C | 36.0 | D | 37.5 | D | 1.5 | No | 34.7 | C[49] |
| | | PM | **56.0** | **E** | **69.4** | **E** | **71.9** | **E** | 2.5 | No | 48.0 | D[49] |
| | | Sat MD | **112.0** | **F** | **134.5** | **F** | **148.1** | **F** | **13.6** | **Yes** | **107.4** | **F[49]** |
| 15. SR-57 SB Ramps at Imperial Highway | D | AM | 15.3 | B | 15.8 | B | 15.9 | B | 0.1 | No | -- | -- |
| | | PM | 15.9 | B | 17.7 | B | 18.1 | B | 0.4 | No | -- | -- |
| | | Sat MD | 17.5 | B | 20.4 | C | 20.7 | C | 0.3 | No | -- | -- |

Notes:

- **Bold HCM/LOS** values indicate adverse service levels based on the City LOS standards.
- s/v = seconds per vehicle (delay)

[49] Please note that the recommended improvement at this intersection takes into consideration the on-ramp modifications and restriping the no. 3 eastbound through lane along Imperial Highway at the SR-57 SB On-Ramp to a shared through/right-turn lane. In the event that Caltrans does not proceed with this improvement, the intersection would result in the following levels of service: *AM Peak Hour = 37.4 s/v, LOS D; PM Peak Hour = 71.9 s/v, LOS E, Sat. Midday Peak Hour = 148.0 s/v, LOS F.*

## TABLE 8-4 (CONTINUED)
## YEAR 2045 PEAK HOUR INTERSECTION CAPACITY ANALYSIS - HCM

| Study Intersection | Minimum Acceptable LOS | Time Period | (1) Existing Traffic Conditions | | (2) Year 2045 Traffic Conditions | | (3) Year 2045 Plus Project Traffic Conditions | | (4) Exceed LOS Thresholds | | (5) Year 2045 Plus Project with Improvements Traffic Conditions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Delay (s/v) | LOS | Delay (s/v) | LOS | Delay (s/v) | LOS | Increase | Yes/No | Delay (s/v) | LOS |
| 16. SR-57 NB Ramps at Imperial Highway | D | AM | 21.2 | C | 25.0 | C | 25.4 | C | 0.4 | No | -- | -- |
| | | PM | 22.5 | C | 26.1 | C | 26.1 | C | 0.0 | No | -- | -- |
| | | Sat MD | 36.5 | D | 42.5 | D | 42.6 | D | 0.1 | No | -- | -- |
| 17. Associated Road at Imperial Highway | D | AM | 27.2 | C | 33.1 | C | 33.3 | C | 0.2 | No | -- | -- |
| | | PM | 40.7 | D | 46.6 | D | 48.5 | D | 1.9 | No | -- | -- |
| | | Sat MD | 34.5 | C | 35.9 | D | 35.9 | D | 0.0 | No | -- | -- |
| 18. Castlegate Lane/ Placentia Avenue at Imperial Highway | D | AM | 18.1 | B | 18.7 | B | 18.8 | B | 0.1 | No | -- | -- |
| | | PM | 24.0 | C | 28.1 | C | 28.2 | C | 0.1 | No | -- | -- |
| | | Sat MD | 20.8 | C | 23.5 | C | 23.7 | C | 0.2 | No | -- | -- |

Notes:

- **Bold HCM/LOS** values indicate adverse service levels based on the City LOS standards.
- s/v = seconds per vehicle (delay)

# 9.0 INTERSECTION VEHICLE QUEUEING EVALUATION

A queueing evaluation has been completed for the intersections of Randolph Avenue at Imperial Highway (Intersection No. 13) and State College Boulevard at Imperial Highway (Intersection No. 14) to assess if the stacking requirements for the turn pockets leading to and from the proposed Project site are adequate after the addition of Project traffic volumes.

The queuing evaluation was conducted for Year 2026 cumulative and Year 2045 buildout traffic conditions based on the Average Queue methodology, which calculates the average queue value in terms of number of vehicles per lane. At signalized intersections, the storage length for left-turn and right-turn lanes may be based on one and one-half (1½) to two (2) times the average number of vehicles that would store per signal cycle[50]. For the purposes of this traffic analysis, the minimum storage requirement for left-turn lanes and right-turn lanes was calculated by taking 1½ times the average queue length. (Minimum required storage = $Q_{av}$ (feet) x 1.5). The storage lengths at unsignalized intersection locations are based on 95$^{th}$ Percentile methodology.

It should be noted that the Synchro software takes into consideration traffic volume data, lane configurations, traffic signal phasing and potential weaving between intersections in order to calculate the queues for each movement. The existing storage lengths were determined based on a review of aerial maps of the subject intersections obtained from Google Earth and field reviews conducted by LLG Engineers. An average vehicle length of 25 feet is assumed for the purposes of this analysis.

## 9.1 Year 2026 Traffic Conditions

***Table 9-1*** presents the AM, PM and Saturday Midday peak hour queueing analyses results for the two (2) study intersections for Year 2026. The first column (1) of *Table 9-1* presents the resultant queues for Year 2026 cumulative traffic conditions. The second column (2) presents the resultant queues for Year 2026 cumulative traffic conditions with the addition of Project traffic. The third column (3) presents the resultant queues with the inclusion of recommended traffic improvements, where needed.

### 9.1.1 *Year 2026 Cumulative Traffic Conditions*

Review of column (1) of *Table 9-1* indicates that one (1) of the two (2) study intersections have queues which exceed the provided storage capacity for one or more intersection approach under Year 2026 cumulative traffic conditions. The remaining study intersection has queues that are adequately accommodated by the provided storage space. The intersections/approaches with storage deficiencies include the following:

- Intersection No. 14: State College Boulevard at Imperial Highway
  - Southbound Left-Turn: PM Peak Hour and Saturday Midday Peak Hour
  - Westbound Right-Turn: Saturday Midday Peak Hour

[50] Source: Highway Design Manual, Intersections at Grade, page 400-9, CALTRANS

### 9.1.2 *Year 2026 Cumulative Plus Project Traffic Conditions*

Review of column (2) of *Table 9-1* indicates that one (1) of the two (2) study intersections have queues which exceed the provided storage capacity for one or more intersection approach with the addition of proposed Project traffic to Year 2026 cumulative traffic conditions. The remaining study intersection has queues that are adequately accommodated by the provided storage space. The intersections/approaches with storage deficiencies include the following:

- Intersection No. 14: State College Boulevard at Imperial Highway
  - Southbound Left-Turn: PM Peak Hour and Saturday Midday Peak Hour
  - Westbound Right-Turn: Saturday Midday Peak Hour

Review of column (3) of *Table 9-1* indicates that the southbound left-turn and westbound right turn at State College Boulevard at Imperial Highway (Intersection No. 14) exceeds the storage capacity and the added project trips would increase these movements by more than one vehicle. However, with the recommended improvements this intersection would operate better than pre-Project conditions for the southbound left-turn. It should be noted that the westbound right-turn has constraints that does not allow for any feasible improvements to be implemented. Therefore, the westbound right-turn pocket will continue to exceed the pocket.

***Appendix F*** presents the Synchro queuing worksheets for the study intersections.

## 9.2 Year 2045 Traffic Conditions

***Table 9-2*** presents the AM, PM and Saturday Midday peak hour queueing analyses results for the two (2) study intersections for Year 2045. The first column (1) of *Table 9-2* presents the resultant queues for Year 2045 buildout traffic conditions. The second column (2) presents the resultant queues for Year 2045 buildout traffic conditions with the addition of Project traffic. The third column (3) presents the resultant queues with the inclusion of recommended traffic improvements, where needed.

### 9.2.1 *Year 2045 Buildout Traffic Conditions*

Review of column (1) of *Table 9-2* indicates that one (1) of the two (2) study intersections have queues which exceed the provided storage capacity for one or more intersection approach under Year 2045 buildout traffic conditions. The remaining study intersection has queues that are adequately accommodated by the provided storage space. The intersections/approaches with storage deficiencies include the following:

- Intersection No. 14: State College Boulevard at Imperial Highway
  - Southbound Left-Turn: PM Peak Hour and Saturday Midday Peak Hour
  - Westbound Right-Turn: Saturday Midday Peak Hour

### 9.2.2 *Year 2045 Buildout Plus Project Traffic Conditions*

Review of column (2) of *Table 9-2* indicates that one (1) of the two (2) study intersections have queues which exceed the provided storage capacity for one or more intersection approach with the addition of proposed Project traffic to Year 2045 buildout traffic conditions. The remaining study intersection has queues that are adequately accommodated by the provided storage space. The intersections/approaches with storage deficiencies include the following:

- Intersection No. 14: State College Boulevard at Imperial Highway
  - Southbound Left-Turn: PM Peak Hour and Saturday Midday Peak Hour
  - Westbound Right-Turn: Saturday Midday Peak Hour

Review of column (3) of *Table 9-1* indicates that the southbound left-turn and westbound right turn at State College Boulevard at Imperial Highway (Intersection No. 14) exceeds the storage capacity and the added project trips would increase these movements by more than one vehicle. However, with the recommended improvements this intersection would operate better than pre-Project conditions for the southbound left-turn. It should be noted that the westbound right-turn has constraints that does not allow for any feasible improvements to be implemented. Therefore, the westbound right-turn pocket will continue to exceed the pocket.

*Appendix F* presents the Synchro queuing worksheets for the study intersections.

**TABLE 9-1**
**YEAR 2026 PEAK HOUR INTERSECTION QUEUING ANALYSIS**

| Study Intersection | Estimated Storage Provided (feet) | (1) Year 2026 Traffic Conditions | | | | | | (2) Year 2026 Plus Project Traffic Conditions | | | | | | (3) Year 2026 Plus Project with Improvements Traffic Conditions | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AM Peak Hour | | PM Peak Hour | | Sat. MD Peak Hour | | AM Peak Hour | | PM Peak Hour | | Sat. MD Peak Hour | | AM Peak Hour | | PM Peak Hour | | Sat. MD Peak Hour | |
| | | Max. Queue/ Min. Storage Req.[51] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[51] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[51] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[51] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[51] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[51] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[51] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[51] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[51] | Adequate Storage (Yes / No) |
| 13. Randolph Avenue at Imperial Highway | | | | | | | | | | | | | | | | | | | |
| *Southbound Left-Turn*[52] | 160 | 57 | Yes | 152 | Yes | 228 | Yes[53] | 81 | Yes | 167 | Yes[53] | 245 | Yes[53] | -- | -- | -- | -- | -- | -- |
| *Eastbound Left-Turn*[52] | 165 | 44 | Yes | 173 | Yes[53] | 219 | Yes[53] | 74 | Yes | 240 | Yes Yes[53] | 243 | Yes[53] | -- | -- | -- | -- | -- | -- |
| *Westbound Right-Turn* | 310 | 25 | Yes | 25 | Yes | 25 | Yes | 25 | Yes | 27 | Yes | 25 | Yes | -- | -- | -- | -- | -- | -- |
| 14. State College Boulevard at Imperial Highway | | | | | | | | | | | | | | | | | | | |
| *Southbound Left-Turn*[52] | 260 / 443[54] | 68 | Yes | **489** | **No** | **762** | **No** | 84 | Yes | **513** | **No** | **852** | **No** | 83[55] | Yes | 396[55] | Yes | **746**[55] | **No** |
| *Southbound Right-Turn*[56] | 275 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 25 | Yes | 25 | Yes | 77 | Yes |
| *Eastbound Left-Turn*[52] | 180 | 25 | Yes | 65 | Yes | 84 | Yes | 25 | Yes | 66 | Yes | 84 | Yes | 25 | Yes | 66 | Yes | 84 | Yes |
| *Westbound Right-Turn* | 250 | 25 | Yes | 194 | Yes | **1,503** | **No** | 35 | Yes | 312 | Yes[53] | **1,557** | **No** | 35 | Yes | 312 | Yes[53] | **1,557** | **No** |

[51] Maximum queue in feet (ft) is calculated by multiplying the *Average Queue* by a factor of 1.5.
[52] The turn-lane consists of dual lanes.
[53] The remaining queue can be accommodated within the transition area of the turn-lane.
[54] Existing storage is 260 feet per lane. Recommended improvements at the study intersection include modifying the existing median and restriping the no. 2 southbound left-turn lane into a trap left-turn lane. As a result, with improvements, the first lane will consist of approximately 260 feet and the second lane will consist of approximately 625 feet of storage. The storage reported is the average of both lanes.
[55] Please note that the recommended improvement at this intersection takes into consideration the on-ramp modifications and restriping the no. 3 eastbound through lane along Imperial Highway at the SR-57 SB On-Ramp to a shared through/right-turn lane. In the event that Caltrans does not proceed with this improvement, the southbound left-turn at the intersection would result in the following queues: *AM Peak Hour = 84 feet; PM Peak Hour = 513 feet, Sat. Midday Peak Hour = 852 feet*. The queues for the remaining turn pockets would remain the same as reported in column (3).
[56] An exclusive southbound right-turn lane is a recommended improvement. The provided storage is approximated.

## TABLE 9-2
## YEAR 2045 PEAK HOUR INTERSECTION QUEUING ANALYSIS

| Study Intersection | Estimated Storage Provided (feet) | (1) Year 2045 Traffic Conditions | | | | | | (2) Year 2045 Plus Project Traffic Conditions | | | | | | (3) Year 2045 Plus Project with Improvements Traffic Conditions | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AM Peak Hour | | PM Peak Hour | | Sat. MD Peak Hour | | AM Peak Hour | | PM Peak Hour | | Sat. MD Peak Hour | | AM Peak Hour | | PM Peak Hour | | Sat. MD Peak Hour | |
| | | Max. Queue/ Min. Storage Req.[57] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[57] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[57] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[57] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[57] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[57] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[57] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[57] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[57] | Adequate Storage (Yes / No) |
| 13. Randolph Avenue at Imperial Highway | | | | | | | | | | | | | | | | | | | |
| *Southbound Left-Turn*[58] | 160 | 48 | Yes | 135 | Yes | 213 | Yes[59] | 59 | Yes | 146 | Yes | 228 | Yes[59] | -- | -- | -- | -- | -- | -- |
| *Eastbound Left-Turn*[58] | 165 | 62 | Yes | 173 | Yes[59] | 216 | Yes[59] | 89 | Yes | 236 | Yes[59] | 236 | Yes[59] | -- | -- | -- | -- | -- | -- |
| *Westbound Right-Turn* | 310 | 90 | Yes | 25 | Yes | 25 | Yes | 25 | Yes | 27 | Yes | 25 | Yes | -- | -- | -- | -- | -- | -- |
| 14. State College Boulevard at Imperial Highway | | | | | | | | | | | | | | | | | | | |
| *Southbound Left-Turn*[58] | 260 / 443[60] | 80 | Yes | **449** | **No** | **638** | **No** | 107 | Yes | **470** | **No** | **711** | **No** | 93[61] | Yes | 354[61] | Yes | **608**[61] | **No** |
| *Southbound Right-Turn*[62] | 275 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 25 | Yes | 25 | Yes | 51 | Yes |
| *Eastbound Left-Turn*[58] | 180 | 25 | Yes | 66 | Yes | 81 | Yes | 25 | Yes | 66 | Yes | 83 | Yes | 25 | Yes | 66 | Yes | 83 | Yes |
| *Westbound Right-Turn* | 250 | 25 | Yes | 230 | Yes | **1,778** | **No** | 33 | Yes | 326 | Yes[59] | **1,824** | **No** | 33 | Yes | 326 | Yes[59] | **1,824** | **No** |

57 Maximum queue in feet (ft) is calculated by multiplying the *Average Queue* by a factor of 1.5.

58 The turn-lane consists of dual lanes.

59 The remaining queue can be accommodated within the transition area of the turn-lane.

60 Existing storage is 260 feet per lane. Recommended improvements at the study intersection include modifying the existing median and restriping the no. 2 southbound left-turn lane into a trap left-turn lane. As a result, with improvements, the first lane will consist of approximately 260 feet and the second lane will consist of approximately 625 feet of storage. The storage reported is the average of both lanes.

61 Please note that the recommended improvement at this intersection takes into consideration the on-ramp modifications and restriping the no. 3 eastbound through lane along Imperial Highway at the SR-57 SB On-Ramp to a shared through/right-turn lane. In the event that Caltrans does not proceed with this modification, the southbound left-turn at the intersection would result in the following queues: *AM Peak Hour = 107 feet; PM Peak Hour = 470 feet, Sat. Midday Peak Hour = 711 feet*. The queues for the remaining turn pockets would remain the same as reported in column (3).

62 An exclusive southbound right-turn lane is a recommended improvement. The provided storage is approximated.

# 10.0 SITE ACCESS AND INTERNAL CIRCULATION EVALUATION

## 10.1 Site Access

The Brea Mall can be accessed from three of the four surrounding streets bordering the subject property, State College Boulevard, Randolph Avenue, and Birch Street; no vehicular access is provided from Imperial Highway. Vehicular access from Randolph Avenue is currently provided by two (2) signalized intersections, whereas one (1) signalized access is provided along Birch Street. From State College Boulevard, three (3) signalized intersections provide access to the Brea Mall. No change in access to the Brea Mall is proposed as a part of the Project. Since the Project is focused to the southwest portion of the Brea Mall property the southernmost driveways along Randolph Avenue and State College Boulevard are anticipated to be the focus of Project related trips.

As shown in *Tables 8-1* through *8-4,* the intersections of Randolph Avenue at Madison Way, Randolph Avenue at Brea Mall, and Brea Mall South at State College Boulevard are forecast to operate at LOS D or better during the Weekday AM, Weekday PM, and Weekend (Saturday) Midday peak hours in all traffic conditions.

## 10.2 Focused Project Driveway Synchro Queuing Assessment

Per the direction of City on Brea and Caltrans a focused Synchro assessment has been completed at the two Project Driveways located closest to Imperial Highway along State College Boulevard and Randolph Avenue to assess if the stacking requirements with the proposed Project are adequate. It is our understanding the City of Brea and Caltrans would like to ensure that Randolph Avenue does not queue back from the Project Driveway onto Imperial Highway. As it relates to State College it is our understanding the City of Brea and Caltrans are concerned with how the southbound dual lefts will interact with the freeway on-ramp.

The queuing evaluation was conducted for Year 2026 Plus Project Traffic Conditions and Year 2045 Plus Project Traffic Conditions. The Average Queue methodology was used which calculates the average queue value in terms of number of vehicles per lane. At signalized intersections, the storage length for left-turn and right-turn lanes can vary based on vehicle demand and the green-time provided by the traffic signal. For the purposes of this traffic analysis, the minimum storage requirement for left-turn lanes and right-turn lanes was calculated by multiplying the anticipated average queue length computed by the Synchro modeling program by 150 percent.

***Tables 10-1*** and ***10-2*** identifies the minimum required stacking/storage lengths for the key study locations for Year 2026 Plus Project Traffic conditions. Review of *Tables 10-1* and *10-2* shows that the southbound left-turn movement at State College Boulevard at Imperial Highway has queues that exceed its capacity. The southbound left-turn lanes are underutilized due to the presence of a single SR-57 southbound on-ramp from Imperial Highway to the east of the intersection. In addition to the recommended improvements as detailed in *Section 11.0,* the addition of a second SR-57 southbound on-ramp from Imperial Highway would help distribute southbound left-turn traffic more equally between the lanes. Although the southbound left-turn movement would still have queues that exceed its capacity, the queue would be improved by these recommendations. It should be noted that the

queue related to the inbound movement at the Project driveways along State College Boulevard and Randolph Avenue are not anticipated to queue back to Imperial Highway. In addition, the outbound queues at the Project driveways along State College Boulevard and Randolph Avenue are forecast to queue through the internal intersection. However, since these internal intersections are designed as all-way stops it allows for adequate traffic control to minimize conflicts and congestion.

***Appendix F*** presents the Synchro queuing worksheets for the Project driveways.

**TABLE 10-1**
**YEAR 2026 DRIVEWAY QUEUING ANALYSIS**

| Study Intersection | Estimated Storage Provided (feet) | (1) Year 2026 Traffic Conditions | | | | | | (2) Year 2026 Plus Project Traffic Conditions | | | | | | (3) Year 2026 Plus Project with Improvements Traffic Conditions | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AM Peak Hour | | PM Peak Hour | | Sat. MD Peak Hour | | AM Peak Hour | | PM Peak Hour | | Sat. MD Peak Hour | | AM Peak Hour | | PM Peak Hour | | Sat. MD Peak Hour | |
| | | Max. Queue/ Min. Storage Req.[63] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[63] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[63] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[63] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[63] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[63] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[63] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[63] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[63] | Adequate Storage (Yes / No) |
| 8. Randolph Avenue at Brea Mall | | | | | | | | | | | | | | | | | | | |
| *Northbound Through/Right-Turn* | 345 | 25 | Yes | 25 | Yes | 183 | Yes | 25 | Yes | 36 | Yes | 207 | Yes | -- | -- | -- | -- | -- | -- |
| *Southbound Left-Turn* | 115 | 25 | Yes | 25 | Yes | 25 | Yes | 25 | Yes | 25 | Yes | 29 | Yes | -- | -- | -- | -- | -- | -- |
| *Westbound Left-Turn* | 110 | 32 | Yes | 224 | Yes[64] | 224 | Yes[64] | 137 | Yes[64] | 257 | Yes[64] | 281 | Yes[64] | -- | -- | -- | -- | -- | -- |
| *Westbound Left/Through/Right* | 110 | 25 | Yes | 198 | Yes[64] | 195 | Yes[64] | 25 | Yes | 230 | Yes[64] | 249 | Yes[64] | -- | -- | -- | -- | -- | -- |
| 9. Brea Mall South at State College Boulevard | | | | | | | | | | | | | | | | | | | |
| *Southbound Left/Through* | 120 | 25 | Yes | 41 | Yes | 54 | Yes | 25 | Yes | 48 | Yes | 69 | Yes | -- | -- | -- | -- | -- | -- |
| *Southbound Through* | 120 | 25 | Yes | 41 | Yes | 54 | Yes | 25 | Yes | 48 | Yes | 69 | Yes | -- | -- | -- | -- | -- | -- |
| *Southbound Right-Turn* | 120 | 25 | Yes | 117 | Yes | 303 | Yes[64] | 25 | Yes | 150 | Yes[64] | 528 | Yes[64] | -- | -- | -- | -- | -- | -- |
| *Eastbound Left-Turn*[65] | 220 | 56 | Yes | 345 | Yes[66] | 450 | Yes[66] | 104 | Yes | 426 | Yes[66] | 488 | Yes[66] | -- | -- | -- | -- | -- | -- |
| *Eastbound Through* | 575 | 65 | Yes | 354 | Yes | 25 | Yes | 77 | Yes | 342 | Yes | 189 | Yes | -- | -- | -- | -- | -- | -- |
| *Westbound Through/Right* | 1,115 | 147 | Yes | 306 | Yes | 360 | Yes | 153 | Yes | 321 | Yes | 365 | Yes | -- | -- | -- | -- | -- | -- |
| 14. State College Boulevard at Imperial Highway | | | | | | | | | | | | | | | | | | | |
| *Southbound Left-Turn*[65] | 260 / 443[67] | 68 | Yes | **489** | **No** | **762** | **No** | 84 | Yes | **513** | **No** | **852** | **No** | 83[68] | Yes | 396[68] | Yes | **746[68]** | **No** |

63 Maximum queue in feet (ft) is calculated by multiplying the *Average Queue* by a factor of 1.5.

64 The remaining queue can be accommodated within the project site.

65 The turn-lane consists of dual lanes.

66 The remaining queue can be accommodated within the transition area of the turn-lane.

67 Existing storage is 260 feet per lane. Recommended improvements at the study intersection include modifying the existing median and restriping the no. 2 southbound left-turn lane into a trap left-turn lane. As a result, with improvements, the first lane will consist of approximately 260 feet and the second lane will consist of approximately 625 feet of storage. The storage reported is the average of both lanes.

68 Please note that the recommended improvement at this intersection takes into consideration the on-ramp modifications and restriping the no. 3 eastbound through lane along Imperial Highway at the SR-57 SB On-Ramp to a shared through/right-turn lane. In the event that Caltrans does not proceed with the restriping, the southbound left-turn at the intersection would result in the following queues: *AM Peak Hour = 84 feet; PM Peak Hour = 513 feet, Sat. Midday Peak Hour = 852 feet*. The queues for the remaining turn pockets would remain the same as reported in column (3).

## TABLE 10-2
## YEAR 2045 DRIVEWAY QUEUING ANALYSIS

| Study Intersection | Estimated Storage Provided (feet) | (1) Year 2045 Traffic Conditions | | | | | | (2) Year 2045 Plus Project Traffic Conditions | | | | | | (3) Year 2045 Plus Project with Improvements Traffic Conditions | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AM Peak Hour | | PM Peak Hour | | Sat. MD Peak Hour | | AM Peak Hour | | PM Peak Hour | | Sat. MD Peak Hour | | AM Peak Hour | | PM Peak Hour | | Sat. MD Peak Hour | |
| | | Max. Queue/ Min. Storage Req.[69] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[69] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[69] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[69] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[69] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[69] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[69] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[69] | Adequate Storage (Yes / No) | Max. Queue/ Min. Storage Req.[69] | Adequate Storage (Yes / No) |
| 8. Randolph Avenue at Brea Mall | | | | | | | | | | | | | | | | | | | |
| *Northbound Through/Right-Turn* | 345 | 25 | Yes | 25 | Yes | 25 | Yes | 25 | Yes | 35 | Yes | 281 | Yes | -- | -- | -- | -- | -- | -- |
| *Southbound Left-Turn* | 115 | 25 | Yes | 25 | Yes | 25 | Yes | 25 | Yes | 25 | Yes | 25 | Yes | -- | -- | -- | -- | -- | -- |
| *Westbound Left-Turn* | 110 | 25 | Yes | **203** | Yes[70] | **200** | Yes[70] | 83 | Yes | **231** | Yes[70] | **248** | Yes[70] | -- | -- | -- | -- | -- | -- |
| *Westbound Left/Through/Right* | 110 | 25 | Yes | **174** | Yes[70] | **173** | Yes[70] | 25 | Yes | **203** | Yes[70] | **218** | Yes[70] | -- | -- | -- | -- | -- | -- |
| 9. Brea Mall South at State College Boulevard | | | | | | | | | | | | | | | | | | | |
| *Southbound Left/Through* | 120 | 25 | Yes | 36 | Yes | 51 | Yes | 25 | Yes | 44 | Yes | 65 | Yes | -- | -- | -- | -- | -- | -- |
| *Southbound Through* | 120 | 25 | Yes | 36 | Yes | 51 | Yes | 25 | Yes | 44 | Yes | 65 | Yes | -- | -- | -- | -- | -- | -- |
| *Southbound Right-Turn* | 120 | 25 | Yes | 65 | Yes | **186** | Yes[70] | 25 | Yes | 86 | Yes | **378** | Yes[70] | -- | -- | -- | -- | -- | -- |
| *Eastbound Left-Turn*[71] | 220 | 53 | Yes | 314 | Yes[72] | 438 | Yes[72] | 87 | Yes | 383 | Yes[72] | 476 | Yes[72] | -- | -- | -- | -- | -- | -- |
| *Eastbound Through* | 575 | 158 | Yes | 315 | Yes | 236 | Yes | 53 | Yes | 308 | Yes | 233 | Yes | -- | -- | -- | -- | -- | -- |
| *Westbound Through/Right* | 1,115 | 210 | Yes | 293 | Yes | 333 | Yes | 218 | Yes | 306 | Yes | 336 | Yes | -- | -- | -- | -- | -- | -- |
| 14. State College Boulevard at Imperial Highway | | | | | | | | | | | | | | | | | | | |
| *Southbound Left-Turn*[71] | 260 / 443[73] | 80 | Yes | **449** | **No** | **638** | **No** | 107 | Yes | **470** | **No** | **711** | **No** | 93[74] | Yes | 354[74] | Yes | **608**[74] | **No** |

69 Maximum queue in feet (ft) is calculated by multiplying the *Average Queue* by a factor of 1.5.

70 The remaining queue can be accommodated within the project site.

71 The turn-lane consists of dual lanes.

72 The remaining queue can be accommodated within the transition area of the turn-lane.

73 Existing storage is 260 feet per lane. Recommended improvements at the study intersection include modifying the existing median and restriping the no. 2 southbound left-turn lane into a trap left-turn lane. As a result, with improvements, the first lane will consist of approximately 260 feet and the second lane will consist of approximately 625 feet of storage. The storage reported is the average of both lanes.

74 Please note that the recommended improvement at this intersection takes into consideration the on-ramp modifications and restriping the no. 3 eastbound through lane along Imperial Highway at the SR-57 SB On-Ramp to a shared through/right-turn lane. In the event that Caltrans does not proceed with this improvement, the southbound left-turn at the intersection would result in the following queues: *AM Peak Hour = 107 feet; PM Peak Hour = 470 feet, Sat. Midday Peak Hour = 711 feet*. The queues for the remaining turn pockets would remain the same as reported in column (3).

# 11.0 AREA-WIDE TRAFFIC IMPROVEMENTS

For those intersections where projected traffic volumes are expected to exceed the LOS criteria thresholds, this report recommends traffic improvements that change the intersection geometry to increase capacity. These capacity improvements involve roadway widening and/or re-striping to reconfigure roadways to specific approaches of a study intersection. The identified improvements are expected to improve levels of service at the location which exceed the LOS criteria thresholds.

***Figures 11-1*** and ***11-2*** present the recommended improvements and intersection controls at the key study intersections for the Year 2026 and Year 2045 traffic conditions per ICU analysis and HCM analysis, respectively. These are discussed in more detail in the sections below.

***Table 11-1*** identifies the incremental intersection improvements needed by the relevant study years to maintain, where possible, acceptable service levels based on the LOS standards defined in this report, as detailed in the sections below.

## 11.1 Planned Improvements

The following improvements listed below are part of the SR-57 Lambert Interchange improvement project, now under construction, that have been included in the Year 2026 and Year 2045 background traffic conditions:

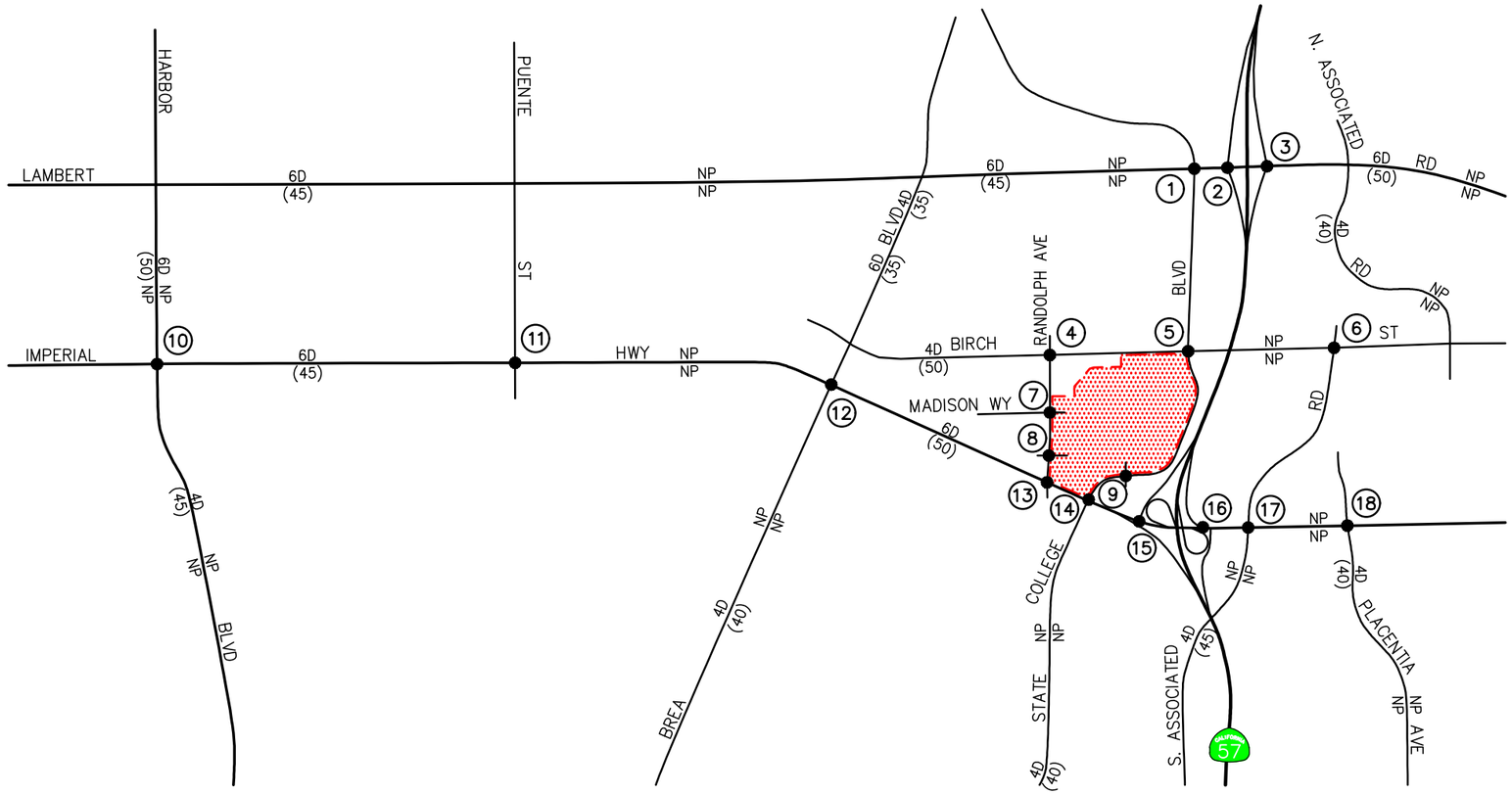
- **No. 2 – SR-57 SB Ramps at Lambert Road:** Widen the off-ramp to provide a second exclusive southbound left-turn lane. Restripe the shared southbound left-turn/through/right-turn lane to a second exclusive right-turn lane. Widen to provide a second exclusive eastbound right-turn lane. Modify the existing traffic signal.

- **No. 3 – SR-57 NB Ramps at Lambert Road:** Construct a loop on-ramp on the south leg. Remove dual eastbound exclusive left-turn lanes. Widen and restripe to provide a shared eastbound through/right-turn lane and an exclusive eastbound right-turn lane. Reconstruct the existing on-ramp for a free westbound right-turn lane. Modify the existing traffic signal.

## 11.2 Year 2026 Plus Project Traffic Conditions Recommended Improvements

### 11.2.1 *Year 2026 Plus Project – ICU*

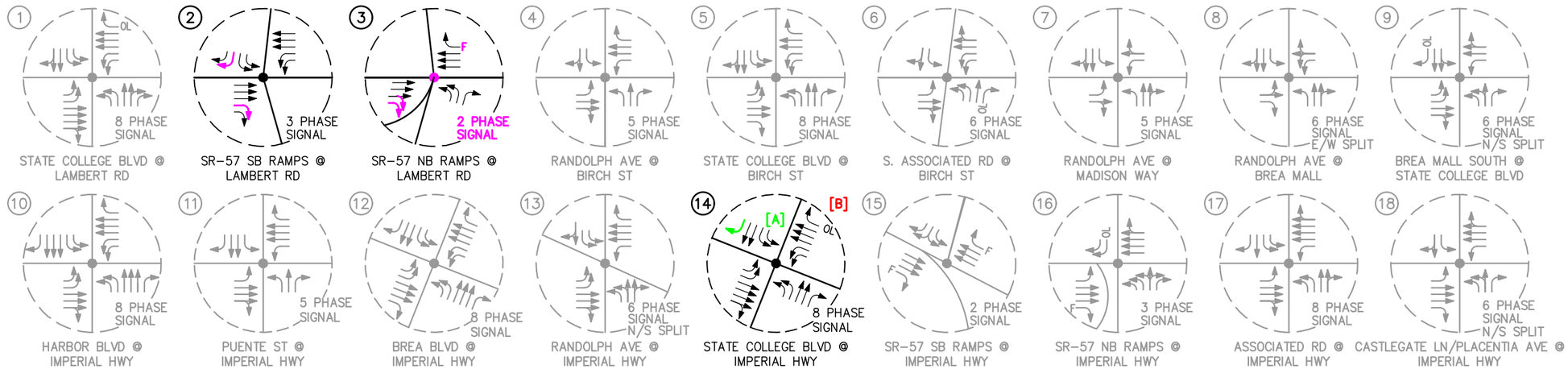
The results of the intersection capacity analyses presented previously in *Table 8-1* show that one (1) of the eighteen (18) study intersections require Project-related improvements under Year 2026 Plus Project traffic conditions based on ICU analysis. As such, the following intersection improvements are recommended. Per City requirements, the Project may be expected to pay a fair-share/local fee to cover the Project's fair share of the full construction costs needed to implement these improvements. It should be noted that although the intersection of SR-57 Southbound Ramps at Imperial Highway operates at acceptable service levels the recommended improvements will help improve congestion related to weaving and improve service levels at State College Boulevard at Imperial Highway as well.




**NOTES:**

[A] MODIFY THE MEDIAN AND RESTRIPE THE NO. 2 SB LEFT TURN INTO A TRAP LEFT TURN LANE.

[B] IN CONJUNCTION WITH THE LENGTHENING OF THE SOUTHBOUND LEFT-TURN IT IS RECOMMENDED THAT THE NO. 3 EASTBOUND THROUGH LANE ALONG IMPERIAL AT THE SR-57 SOUTHBOUND ON-RAMP BE CONVERTED TO A SHARED THROUGH/RIGHT-TURN LANE.




LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

= APPROACH LANE ASSIGNMENT
= RECOMMENDED IMPROVEMENTS
= YEAR 2026 PLANNED IMPROVEMENTS
= TRAFFIC SIGNAL
= STOP SIGN
F = FREE-RIGHT
OL = OVERLAP
= PROJECT SITE

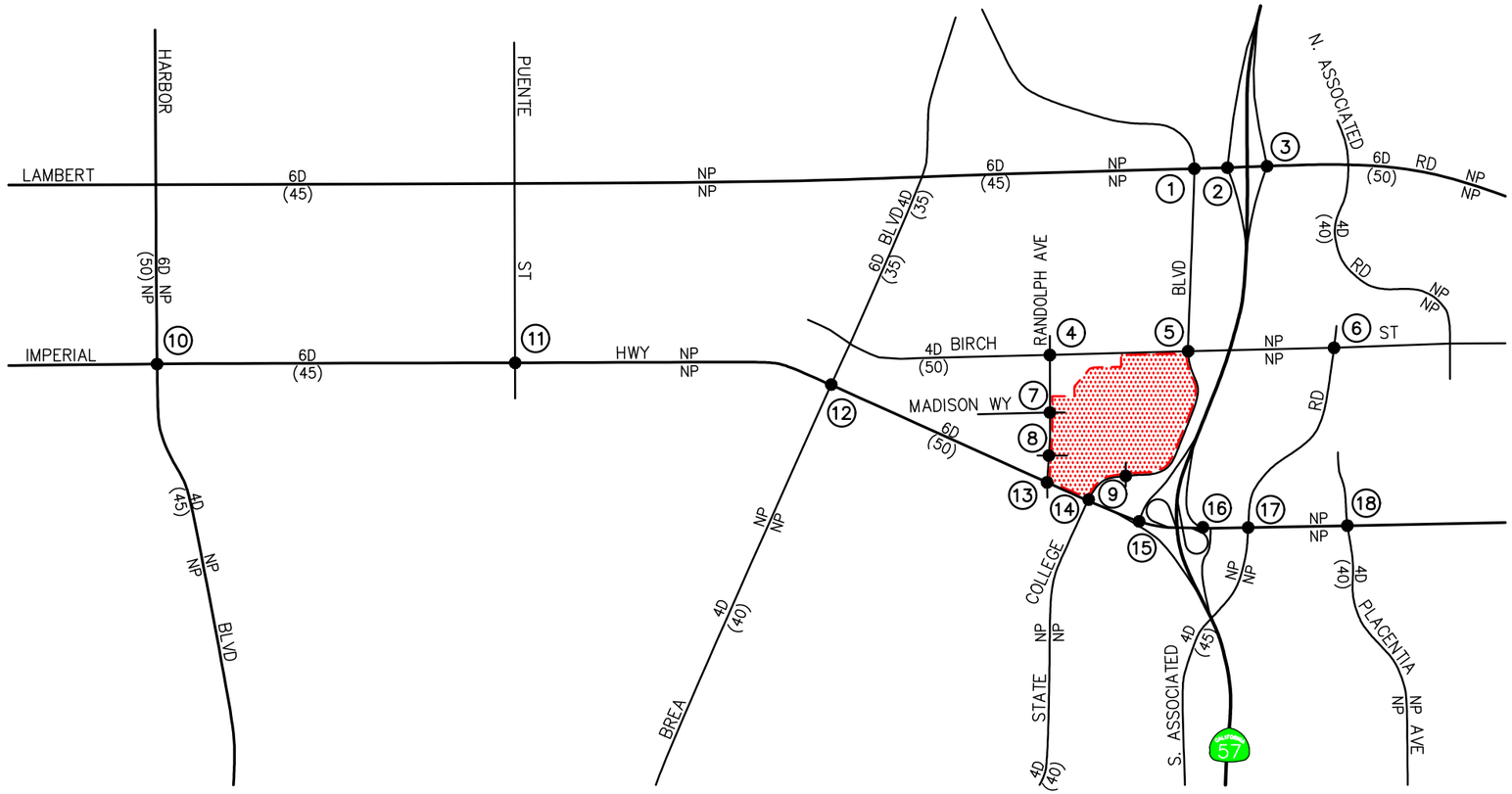
# FIGURE 11-1

## PLANNED AND RECOMMENDED IMPROVEMENTS – ICU

BREA MALL EXPANSION & IMPORVEMENTS, BREA



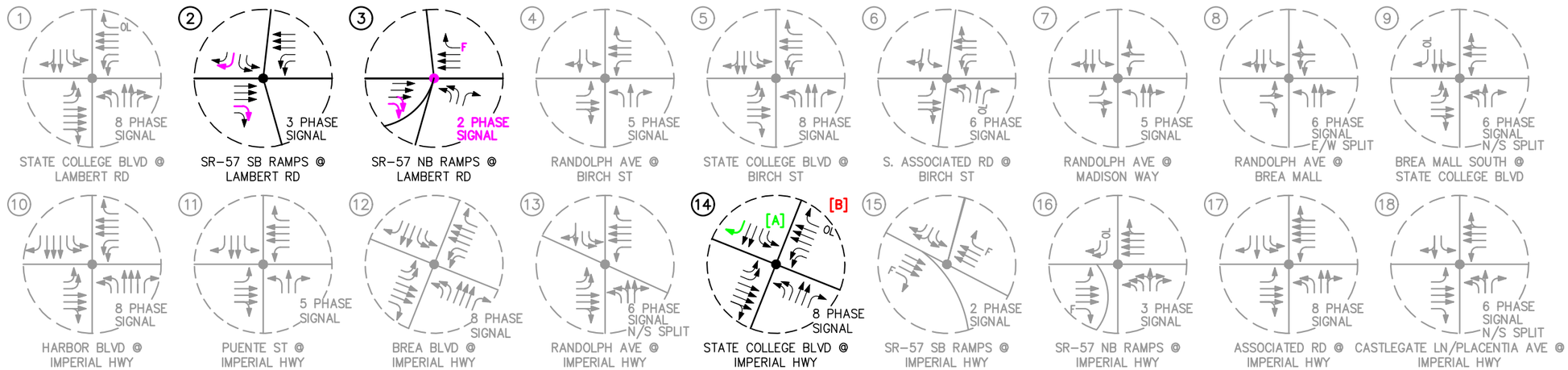
n:\4000\2194099 - brea mall expansion & improvement, brea\dwg\4099 f11-1.dwg LDP 18:43:33 04-14-2022 lam




**NOTES:**

[A] MODIFY THE MEDIAN AND RESTRIPE THE NO. 2 SB LEFT TURN INTO A TRAP LEFT TURN LANE.

[B] IN CONJUNCTION WITH THE LENGTHENING OF THE SOUTHBOUND LEFT-TURN IT IS RECOMMENDED THAT THE NO. 3 EASTBOUND THROUGH LANE ALONG IMPERIAL AT THE SR-57 SOUTHBOUND ON-RAMP BE CONVERTED TO A SHARED THROUGH/RIGHT-TURN LANE.




n:\4000\2194099 - brea mall expansion & improvement, brea\dwg\4099 f11-2.dwg LDP 18:44:08 04-14-2022 lam

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

= APPROACH LANE ASSIGNMENT
= RECOMMENDED IMPROVEMENTS
= YEAR 2026 PLANNED IMPROVEMENTS
= TRAFFIC SIGNAL
= STOP SIGN
F = FREE-RIGHT
OL = OVERLAP
= PROJECT SITE

# FIGURE 11-2

## PLANNED AND RECOMMENDED IMPROVEMENTS - HCM

BREA MALL EXPANSION & IMPORVEMENTS, BREA

- **No. 14 – State College Boulevard at Imperial Highway:** Conduct median modifications and restripe the southbound approach to provide an exclusive southbound right-turn lane. Modify the median and restripe the No. 2 SB left-turn lane into a trap left turn lane. Modify the existing traffic signal, as necessary.

- **No. 15 – SR-57 Southbound Ramps at Imperial Highway:** Restripe the No. 3 eastbound through lane along Imperial at the SR-57 southbound on-ramp to be converted to a shared through/right-turn lane. Modify the on-ramp to allow for two receiving lanes. Modify the existing traffic signal, as necessary.

### 11.2.2 *Year 2026 Plus Project – HCM*

The results of the intersection capacity analyses presented previously in *Table 8-2* show that one (1) of the eighteen (18) study intersections require Project-related improvements under Year 2026 Plus Project traffic conditions based on HCM analysis. As such, the following intersection improvements are recommended. Per City requirements, the Project may be expected to pay a fair-share/local fee to cover the Project's fair share of the full construction costs needed to implement these improvements. It should be noted that although the intersection of SR-57 Southbound Ramps at Imperial Highway operates at acceptable service levels the recommended improvements will help improve congestion related to weaving and improve service levels at State College Boulevard at Imperial Highway as well.

- **No. 14 – State College Boulevard at Imperial Highway:** Conduct median modifications and restripe the southbound approach to provide an exclusive southbound right-turn lane. Modify the median and restripe the No. 2 SB left-turn lane into a trap left turn lane. Modify the existing traffic signal, as necessary.

- **No. 15 – SR-57 Southbound Ramps at Imperial Highway:** Restripe the No. 3 eastbound through lane along Imperial at the SR-57 southbound on-ramp to be converted to a shared through/right-turn lane. Modify the on-ramp to allow for two receiving lanes. Modify the existing traffic signal, as necessary.

## 11.3 Year 2045 Plus Project Traffic Conditions Recommended Improvements

### 11.3.1 *Year 2045 Plus Project – ICU*

The results of the intersection capacity analyses presented previously in *Table 8-3* show that one (1) of the eighteen (18) study intersections require Project-related improvements under Year 2045 Plus Project traffic conditions based on ICU analysis. As such, the following intersection improvements are recommended. Per City requirements, the Project may be expected to pay a fair-share/local fee to cover the Project's fair share of the full construction costs needed to implement these improvements. It should be noted that although the intersection of SR-57 Southbound Ramps at Imperial Highway operates at acceptable service levels the recommended improvements will help improve congestion related to weaving and improve service levels at State College Boulevard at Imperial Highway as well.

- **No. 14 – State College Boulevard at Imperial Highway:** *Same as those identified in Sections 11.2.1.* Conduct median modifications and restripe the southbound approach to provide an exclusive southbound right-turn lane. Modify the median and restripe the No. 2 SB left-turn lane into a trap left turn lane. Modify the existing traffic signal, as necessary.

- **No. 15 – SR-57 Southbound Ramps at Imperial Highway:** Restripe the No. 3 eastbound through lane along Imperial at the SR-57 southbound on-ramp to be converted to a shared through/right-turn lane. Modify the on-ramp to allow for two receiving lanes. Modify the existing traffic signal, as necessary.

### 11.3.2 *Year 2045 Plus Project – HCM*

The results of the intersection capacity analyses presented previously in *Table 8-4* show that one (1) of the eighteen (18) study intersections require Project-related improvements under Year 2045 Plus Project traffic conditions based on HCM analysis. As such, the following intersection improvements are recommended. Per City requirements, the Project may be expected to pay a fair-share/local fee to cover the Project's fair share of the full construction costs needed to implement these improvements. It should be noted that although the intersection of SR-57 Southbound Ramps at Imperial Highway operates at acceptable service levels the recommended improvements will help improve congestion related to weaving and improve service levels at State College Boulevard at Imperial Highway as well.

- **No. 14 – State College Boulevard at Imperial Highway:** *Same as those identified in Section 11.2.2.* Conduct median modifications and restripe the southbound approach to provide an exclusive southbound right-turn lane. Modify the median and restripe the No. 2 SB left-turn lane into a trap left turn lane. Modify the existing traffic signal, as necessary.

- **No. 15 – SR-57 Southbound Ramps at Imperial Highway:** Restripe the No. 3 eastbound through lane along Imperial at the SR-57 southbound on-ramp to be converted to a shared through/right-turn lane. Modify the on-ramp to allow for two receiving lanes, as necessary.

## TABLE 11-1
## SUMMARY OF PROJECT RECOMMENDED IMPROVEMENTS BY SCENARIO

| Study Intersections | Jurisdiction (City Location) | Improvement Description | Improvements by Scenario | | | |
|---|---|---|---|---|---|---|
| | | | Year 2026 Plus Project | | Year 2045 Plus Project | |
| | | | ICU | HCM | ICU | HCM |
| 14. State College Boulevard at Imperial Highway | Caltrans (Brea) | ▪ Restripe to provide exclusive SB right-turn lane | ✓ | ✓ | X | X |
| | | ▪ Modify the median and restripe the No. 2 SB left-turn lane into a trap left turn lane[75] | ✓ | ✓ | X | X |
| | | ▪ Modify existing traffic signal | ✓ | ✓ | X | X |
| 15. SR-57 SB Ramps at Imperial Highway | Caltrans (Brea) | ▪ Restripe the No.3 eastbound through lane into a shared through/right-turn lane | ✓ | ✓ | X | X |
| | | ▪ Modify the on-ramp to allow for two receiving lanes | ✓ | ✓ | X | X |

Notes:

✓ = Denotes that the improvement is implemented in the scenario.

X = Denotes that the improvement carries over from the previous scenario and is assumed to be already implemented.

[75] In conjunction with the lengthening of the southbound left-turn lane it is recommended that the no. 3 eastbound through lane along Imperial Highway at the SR-57 southbound on-ramp be converted to a shared through/right-turn lane.

## 11.4 Project-Related Fair-Share Contribution

The transportation improvements associated with the development of the Project were determined based on the future conditions analysis with and without the proposed Project. The key study locations forecast to operate at adverse levels of service are discussed below. As such, the proposed Project's "fair share" of the recommended improvements has been calculated for the key study intersections that are forecast to operate at adverse levels of service in the Year 2026 Plus Project, and Year 2045 Plus Project traffic conditions. It should be noted that while fair share costs have been calculated Caltrans has no mechanism by which the Project can contribute fair share fees to offset the Project's degradation.

As such the Project may be expected to construct improvements and/or can be expected to pay a proportional "fair-share" of the improvement costs of the impacted intersection to mitigate the Project's traffic degradation.

### 11.4.1 *Year 2026 Plus Project Traffic Conditions*

***Table 11-2*** presents Project's fair-share contribution to construct the recommended improvements at two (2) of the study intersections projected to operate at an unacceptable LOS and/or inadequate queuing in the Year 2026 Plus Project traffic conditions. It should be noted that the intersection improvements identified for SR-57 Southbound Ramps at Imperial Highway are part of the City's Capital Improvement Program (CIP), therefore, the Projects contribution towards the City of Brea Traffic Fees may satisfy a portion of their fair share obligations at this location. It is our understanding that detailed cost estimates will be provided to the City to help determine the exact fair share amount.

### 11.4.2 *Year 2045 Plus Project Traffic Conditions*

***Table 11-3*** presents Project's fair-share contribution to construct the recommended improvements at two (2) of the study intersections projected to operate at an unacceptable LOS and/or inadequate queuing in the Year 2045 Plus Project traffic conditions.

It should be noted that the intersection of State College Boulevard at Imperial Highway is shown to have 0.00% fair share since the recommended improvements are assumed to be implemented in Year 2026 Plus Project traffic conditions. It should be noted that the intersection improvements identified for SR-57 Southbound Ramps at Imperial Highway are part of the City's CIP, therefore, the Projects contribution towards the City of Brea Traffic Fees may satisfy a portion of their fair share obligations at this location. It is our understanding that detailed cost estimates will be provided to the City to help determine the exact fair share amount.

## TABLE 11-2
## YEAR 2026 PROJECT FAIR-SHARE CONTRIBUTION

| Study Intersection | City/ Jurisdiction | Time Period | (1) Existing Traffic | (2) Project Traffic | (3) Year 2026 Plus Project Traffic | (4) Project Fair-Share Percent[76] |
|---|---|---|---|---|---|---|
| 14. State College Boulevard at Imperial Highway | Brea/ Caltrans | AM | -- | -- | -- | -- |
| | | PM | 6,664 | 174 | 7,556 | **19.51%** |
| | | Sat MD | 7,557 | 159 | 8,620 | 14.96% |
| 15. SR-57 SB Ramps at Imperial Highway | Brea/ Caltrans | AM | -- | -- | -- | -- |
| | | PM | 6,268 | 129 | 7,010 | **17.39%** |
| | | Sat MD | 6,979 | 117 | 7,788 | 14.46% |

[76] Project fair-share percentage Column (4) = [Column (2)] / [Column (3) – Column (1)].

## TABLE 11-3
## YEAR 2045 PROJECT FAIR-SHARE CONTRIBUTION

| Study Intersection | City/ Jurisdiction | Time Period | (1) Existing Traffic | (2) Project Traffic | (3) Year 2045 Plus Project Traffic | (4) Project Fair-Share Percent[77] |
|---|---|---|---|---|---|---|
| 14. State College Boulevard at Imperial Highway | Brea/ Caltrans | AM | -- | -- | -- | -- |
| | | PM | -- | -- | -- | -- |
| | | Sat MD | 7,557 | 159 | 9,373 | 0.00%[78] |
| 15. SR-57 SB Ramps at Imperial Highway | Brea/ Caltrans | AM | -- | -- | -- | -- |
| | | PM | -- | -- | -- | -- |
| | | Sat MD | 8,193 | 117 | 8,333 | 0.00%[78] |

[77] Project fair-share percentage Column (4) = [Column (2)] / [Column (3) – Column (1)].

[78] The Projects fair share has already been accounted for in Table 11-2.

## 11.5 City of Brea Traffic Fees

Based on information published on the City of Brea website, the Brea City Council adopted Ordinance 966 in July 1995, establishing Traffic Fees for all new development in Brea and annexed portions of its sphere-of-influence. Based on a Transportation Improvement Nexus Program study conducted in 2011, the City Council adopted Resolution 2011-096, which updated the fees, which became effective February 4, 2012. These fees are required, in part, by Orange County's Measure M, a transportation initiative passed by voters in 1990. More importantly, these are fair-share based fees that will serve to offset, or mitigate, the addition of traffic generated by new development.

Review of ***Table 11-4*** indicates that the City's Traffic Fee rate for residential land uses range from $1,203 per dwelling unit to $1,974 per dwelling unit. For Commercial uses the City's rate ranges between $2.24 per gross square foot and $2.53 per gross square foot.

Subject to confirmation by City staff, the proposed Project's Traffic Fee totals $747,851.00 based on a net increase of 85,425 SF of regional commercial uses along with 383 medium density residential units (i.e. 85,425 SF x $2.24 per SF = $191,352 and 383 DU x $1,453 per DU = $556,499). The precise fee will be determined upon issuance of Project building permits by the City of Brea Community Development Department.

In some cases, a developer may be required to make certain traffic improvements in addition to, or in-lieu of paying traffic fees. In this case, however, the total cost of traffic improvements and/or fees will not exceed the development's fair-share toward mitigating recommended improvements.

## TABLE 11-4
## CITY OF BREA TRAFFIC FEE RATES [79]

| Land Use Category | Unit of Development | Fee |
|---|---|---|
| ▪ Low density residential | Per dwelling unit | $1,974 |
| ▪ Medium density residential | Per dwelling unit | $1,453 |
| ▪ High density residential | Per dwelling unit | $1,203 |
| ▪ Commercial, general, mixed use | Per gross square foot | $2.53 |
| ▪ Regional commercial | Per gross square foot | $2.24 |
| ▪ Office / industrial | Per gross square foot | $1.25 |
| ▪ School | Student | $0 |
| ▪ All other uses | Per trip end | $89 |

[79] Source: City of Brea website - http://www.ci.brea.ca.us/162/Traffic-Impact-Fees

# 12.0 INTERSECTION SAFETY EVALUATION

## 12.1 Caltrans Intersection Safety Evaluation

It is our understanding that Caltrans has implemented improvements at intersections along Imperial Highway within the recent years which generally include traffic signal upgrades and ADA improvements. As such, an intersection safety evaluation has been completed for all of the signalized study intersections located along Imperial Highway and Lambert Road within Caltrans jurisdiction to validate whether the recent improvements have helped reduce the collision frequency at these locations.

Five years of collision history has been researched via the Statewide Integrated Traffic Records System (SWITRS); the data was compiled from May 2016 through May 2021. ***Table 12-1*** presents a summary of the last five (5) years of accident history at the eleven (11) study intersections located along Imperial Highway and/or Lambert Road. Review of *Table 12-1* indicates that when taking into consideration the total number of collisions that occur within the project study area, the number of collisions along Imperial Highway and Lambert Road have generally declined within the last five years. Therefore, it can be concluded that the improvements implemented at these intersections have played a role in reducing the collision frequency and has generally helped increase safety at the locations.

## 12.2 State College Boulevard at Imperial Highway Focused Assessment

A focused safety assessment has been completed at State College Boulevard/Imperial Highway as it relates to vehicles making erratic lane changes to try and enter the SR-57 SB On-Ramp along Imperial Highway. The table below presents the accident data for State College Boulevard at Imperial Highway. Review of this data shows that collisions related to lane changes ranged between 2 to 6 collisions per year. These collisions could be corrected via modifying the SR-57 SB On-Ramp to allow for two lanes onto the freeway. It is recommended that the eastbound approach be modified to accommodate two through lanes, a shared through/right-turn lane and an exclusive right-turn lane.

| **State College Boulevard at Imperial Highway** | | |
|---|---|---|
| ***Time Period*** | ***Total*** | ***Correctable*** |
| 5/16 through 5/17 | 33 | 6 (Lane Change) |
| 5/17 through 5/18 | 26 | 2 (Lane Change) |
| 5/18 through 5/19 | 28 | 3 (Lane Change) |
| 5/19 through 5/20 | 16 | 2 (Lane Change) |
| 5/20 through 5/21 | 19 | 2 (Lane Change) |

## TABLE 12-1
## ACCIDENT HISTORY AT CALTRANS INTERSECTIONS

| Study Intersection | Number of Collisions Per Year | | | | |
|---|---|---|---|---|---|
| | 2016 - 2017 | 2017-2018 | 2018-2019 | 2019-2020 | 2020-2021 |
| 2. SR-57 SB Ramps at Lambert Road | 6 | 4 | 5 | 6 | 3 |
| 3. SR-57 NB Ramps at Lambert Road | 8 | 12 | 7 | 8 | 6 |
| 10. Harbor Boulevard at Imperial Highway | 5 | 9 | 12 | 2 | 4 |
| 11. Puente Street at Imperial Highway | 9 | 6 | 13 | 14 | 9 |
| 12. Brea Boulevard at Imperial Highway | 11 | 14 | 8 | 8 | 5 |
| 13. Randolph Avenue at Imperial Highway | 10 | 4 | 9 | 6 | 6 |
| 14. State College Boulevard at Imperial Highway | 33 | 26 | 28 | 16 | 19 |
| 15. SR-57 SB Ramps at Imperial Highway | 8 | 3 | 8 | 7 | 4 |
| 16. SR-57 NB Ramps at Imperial Highway | 20 | 18 | 12 | 8 | 11 |
| 17. Associated Road at Imperial Highway | 11 | 17 | 14 | 14 | 15 |
| 18. Castlegate Lane/Placentia Avenue at Imperial Highway | 13 | 8 | 11 | 6 | 5 |
| **Total Collisions at Caltrans Intersections** | **134** | **121** | **127** | **95** | **87** |

## 13.0 SUMMARY OF FINDINGS AND CONCLUSIONS

- ***Project Description*** – Brea Mall Mixed Use Project (hereinafter referred to as Project) in the City of Brea. The Project consists of redevelopment of 15.0-acre in the southwest portion of the Brea Mall property that includes the Sears parcel and adjoining transition areas adjacent to Nordstrom and Macy's. The Project involves demolishing 161,990 square-foot (SF) of the Sears department store and associated auto center and roughly 7.5 acres of surface parking in order to development 247,415 SF of new retail space, inclusive of a 50,000 SF sporting goods store and a 128,000 SF health club. The residential component would construct a 383-unit seven-story apartment building. The proposed Project is located west of the State Route (SR) 57 Freeway and is generally bounded by State College Boulevard to the east, Imperial Highway (State Route 91) to the south, Randolph Avenue to the west, and Birch Street to the north. The Project is expected to be developed in several phases with the Year 2026 utilized to assess the Project's potential traffic implications at full occupancy within a near-term cumulative traffic setting. The Brea Mall can be accessed from three of the four surrounding streets bordering the subject property, State College Boulevard, Randolph Avenue, and Birch Street; no vehicular access is provided from Imperial Highway. Vehicular access from Randolph Avenue is currently provided by two (2) signalized intersections, whereas one (1) signalized access is provided along Birch Street. From State College Boulevard, three (3) signalized intersections provide access to the Brea Mall. No change in access to the Brea Mall is proposed as a part of the Project. Since the Project is focused to the southwest portion of the Brea Mall property the southernmost driveways along Randolph Avenue and State College Boulevard are anticipated to be the focus of Project related trips.

- ***Study Scope*** – The following eighteen (18) key study intersections were selected for detailed peak hour level of service analyses under Existing Traffic Conditions, Year 2026 Cumulative Traffic Conditions, Year 2026 Cumulative Plus Project, Year 2045 Traffic Conditions, and Year 2045 Plus Project Traffic Conditions. It should be noted that cities that border the intersection but do not have governing jurisdictions are included in parentheses.

| Study Intersection | | Applicable Jurisdiction (City Location) | | | |
|---|---|---|---|---|---|
| | | Caltrans | City of Brea | City of La Habra | City of Fullerton |
| | State College Boulevard at Lambert Road | -- | Brea | -- | -- |
| 2. | SR-57 SB Ramps at Lambert Road | Caltrans | (Brea) | -- | -- |
| 3. | SR-57 NB Ramps at Lambert Road | Caltrans | (Brea) | -- | -- |
| 4. | Randolph Avenue at Birch Street | -- | Brea | -- | -- |
| 5. | State College Boulevard at Birch Street | -- | Brea | -- | -- |
| 6. | S Associated Road at Birch Street | -- | Brea | -- | -- |
| 7. | Randolph Avenue at Madison Way | -- | Brea | -- | -- |
| 8. | Randolph Avenue at Brea Mall | -- | Brea | -- | -- |
| 9. | Brea Mall South at State College Boulevard | -- | Brea | -- | -- |
| 10. | Harbor Boulevard at Imperial Highway[80] | Caltrans | -- | (La Habra) | (Fullerton) |
| 11. | Puente Street at Imperial Highway | Caltrans | (Brea) | -- | (Fullerton) |
| 12. | Brea Boulevard at Imperial Highway | Caltrans | (Brea) | | |

[80] Orange County Congestion Management Program (CMP) intersection.

| Study Intersection | | Applicable Jurisdiction (City Location) | | | |
|---|---|---|---|---|---|
| | | Caltrans | City of Brea | City of La Habra | City of Fullerton |
| 13. | Randolph Avenue at Imperial Highway | Caltrans | (Brea) | -- | -- |
| 14. | State College Blvd at Imperial Highway[1] | Caltrans | (Brea) | -- | -- |
| 15. | SR-57 SB Ramps at Imperial Highway[1] | Caltrans | (Brea) | -- | -- |
| 16. | SR-57 NB Ramps at Imperial Highway[1] | Caltrans | (Brea) | -- | -- |
| 17. | Associated Road at Imperial Highway | Caltrans | (Brea) | -- | -- |
| 18. | Castlegate Ln/Placentia Ave at Imperial Hwy | Caltrans | (Brea) | -- | -- |

- ***Existing Traffic Conditions ICU*** – The intersection of State College Boulevard at Imperial Highway currently operates at an unacceptable LOS during the Weekend (Saturday) Midday peak hour. The remaining seventeen (17) of the eighteen (18) key study intersections evaluated under ICU analysis currently operate at an acceptable levels of service during the Weekday AM, Weekday PM, and Weekend (Saturday) Midday peak hours.

- ***Existing Traffic Conditions HCM*** – The intersection of State College Boulevard at Imperial Highway currently operates at an unacceptable LOS during the Weekday PM peak hour and Weekend (Saturday) Midday peak hour. The remaining seventeen (17) of the eighteen (18) key study intersections evaluated under HCM analysis currently operate at an acceptable levels of service during the Weekday AM, Weekday PM, and Weekend (Saturday) Midday peak hours.

- ***Project Trip Generation*** – The proposed Project with the existing Brea Mall is forecast to generate approximately 33,976 Weekday daily trips, with 1,067 trips (622 inbound, 445 outbound) produced in the Weekday AM peak hour and 3,556 trips (1,789 inbound, 1,767 outbound) produced in the Weekday PM peak hour on a "typical" weekday. The proposed Project with the existing Brea Mall is forecast to generate 42,060 Saturday daily trips, with 4,484 trips (2,274 inbound, 2,210 outbound) produced in the Saturday Midday peak hour on a "typical" Saturday.

  When the proposed Project is compared to an existing fully occupied Brea Mall site, the proposed Project is forecast to generate 3,159 more Weekday daily trips, 310 more Weekday AM peak hour trips, 309 more Weekday PM peak hour trips, 2,877 more Saturday daily trips, and 280 more Saturday Midday peak hour trips. The potential implications of these added Project trips to the local area roadway network has been evaluated in this traffic analysis.

- ***Related Projects Traffic Characteristics*** **–** There are thirty-two (32) related projects that have been included as part of the cumulative setting. The related projects are expected to generate 38,681 weekday daily trips, with 2,992 trips (1,479 inbound, 1,513 outbound) anticipated during the weekday AM peak hour and 3,561 trips (1,786 inbound, 1,775 outbound) produced during the weekday PM peak hour. On a weekend (Saturday), the related projects are forecast to generate 38,164 weekend daily trips, with 3,909 trips (2,074 inbound, 1,835 outbound) anticipated during the weekend midday peak hour.

- ***Year 2026 Cumulative Traffic Conditions Plus Project ICU*** – One (1) of the eighteen (18) key study intersections will continue to operate at unacceptable levels of services during the Weekday PM peak hour and Weekend (Saturday) Midday peak hour when compared to the LOS standards specified in this report. The intersections forecast to operate adversely are as follows:

| **Key Intersection** |
|---|
| 14. State College Boulevard at Imperial Highway |

  However, the implementation of recommended improvements at the intersection results in better service levels than pre-Project conditions.

- ***Year 2026 Cumulative Traffic Conditions Plus Project HCM*** – One (1) of the eighteen (18) key study intersections will continue to operate at unacceptable levels of services during the Weekday PM peak hour and Weekend (Saturday) Midday peak hour when compared to the LOS standards specified in this report. The intersections forecast to operate adversely are as follows:

| **Key Intersection** |
|---|
| 14. State College Boulevard at Imperial Highway |

  However, the implementation of recommended improvements at the intersection results in service levels than pre-Project conditions.

- ***Year 2045 Traffic Conditions Plus Project ICU*** – Five (5) of the eighteen (18) key study intersections will continue to operate at unacceptable levels of services during the Weekday PM peak hour and Weekend (Saturday) Midday peak hour when compared to the LOS standards specified in this report. The intersections forecast to operate adversely are as follows:

| **Key Intersection** |
|---|
| 10. Harbor Boulevard at Imperial Highway |
| 12. Brea Boulevard at Imperial Highway |
| 14. State College Boulevard at Imperial Highway |
| 16. SR-57 NB Ramps at Imperial Highway |
| 17. Associated Road at Imperial Highway |

  However, implementation of recommended improvements at the intersections of State College Blvd at Imperial Highway (Intersection #14) offsets the Project's increment. After implementation of the recommended improvements, the intersection is forecast to operate at better service levels than pre-Project conditions. It should be noted that the intersection of Harbor Blvd at Imperial Highway (Intersection #10), Brea Blvd at Imperial Highway (Intersection #12), SR-57 NB Ramps at Imperial (intersection #16) and Associated Road at Imperial Highway (Intersection #17) does not satisfy the criteria defined in this report to require improvements.

- ***Year 2045 Traffic Conditions Plus Project HCM*** – Two (2) of the eighteen (18) key study intersections will continue to operate at unacceptable levels of services during the Weekday PM peak hour and Weekend (Saturday) Midday peak hour when compared to the LOS standards specified in this report. The intersections forecast to operate adversely are as follows:

| **Key Intersection** |
|---|
| 10. Harbor Boulevard at Imperial Highway |
| 14. State College Boulevard at Imperial Highway |

  However, the implementation of recommended improvements at the intersection of State College Blvd at Imperial Highway (Intersection #14) offsets the Project's increment. After implementation of the recommended improvements at the intersection State College Blvd at Imperial Highway (Intersection #14) are forecast to operate at better service levels than pre-Project conditions. It should be noted that the intersection of Harbor Blvd at Imperial Highway (Intersection #10) does not satisfy the criteria defined in this report to require improvements.

- The following improvements listed below are part of the SR-57 Lambert Interchange improvement project, now under construction, that have been included in the Year 2026 and Year 2045 background traffic conditions:
  - **No. 2 – SR-57 SB Ramps at Lambert Road:** Widen the off-ramp to provide a second exclusive southbound left-turn lane. Restripe the shared southbound left-turn/through/right-turn lane to a second exclusive right-turn lane. Widen to provide a second exclusive eastbound right-turn lane. Modify the existing traffic signal.

  - **No. 3 – SR-57 NB Ramps at Lambert Road:** Construct a loop on-ramp on the south leg. Remove dual eastbound exclusive left-turn lanes. Widen and restripe to provide a shared eastbound through/right-turn lane and an exclusive eastbound right-turn lane. Reconstruct the existing on-ramp for a free westbound right-turn lane. Modify the existing traffic signal.
- ***Year 2026 Cumulative Plus Project Recommended Improvements (ICU)*** – Based on the LOS criteria defined in this report the following improvements are recommended:
  - **No. 14 – State College Boulevard at Imperial Highway:** Conduct median modifications and restripe the southbound approach to provide an exclusive southbound right-turn lane. Modify the median and restripe the No. 2 SB left-turn lane into a trap left turn lane. Modify the existing traffic signal, as necessary.

  - **No. 15 – SR-57 Southbound Ramps at Imperial Highway:** Restripe the No. 3 eastbound through lane along Imperial at the SR-57 southbound on-ramp to be converted to a shared through/right-turn lane. Modify the on-ramp to allow for two receiving lanes. Modify the existing traffic signal, as necessary.
- ***Year 2026 Cumulative Plus Project Recommended Improvements (HCM)*** – Based on the LOS criteria defined in this report the following improvements are recommended:

- **No. 14 – State College Boulevard at Imperial Highway:** Conduct median modifications and restripe the southbound approach to provide an exclusive southbound right-turn lane. Modify the median and restripe the No. 2 SB left-turn lane into a trap left turn lane. Modify the existing traffic signal, as necessary.

- **No. 15 – SR-57 Southbound Ramps at Imperial Highway:** Restripe the No. 3 eastbound through lane along Imperial at the SR-57 southbound on-ramp to be converted to a shared through/right-turn lane. Modify the on-ramp to allow for two receiving lanes. Modify the existing traffic signal, as necessary.

- ***Year 2045 Plus Project Recommended Improvements (ICU)*** – Based on the LOS criteria defined in this report the following improvements are recommended:
  - **No. 14 – State College Boulevard at Imperial Highway:** Conduct median modifications and restripe the southbound approach to provide an exclusive southbound right-turn lane. Modify the median and restripe the No. 2 SB left-turn lane into a trap left turn lane. Modify the existing traffic signal, as necessary.
  - **No. 15 – SR-57 Southbound Ramps at Imperial Highway:** Restripe the No. 3 eastbound through lane along Imperial at the SR-57 southbound on-ramp to be converted to a shared through/right-turn lane. Modify the on-ramp to allow for two receiving lanes. Modify the existing traffic signal, as necessary.

- ***Year 2045 Plus Project Recommended Improvements (HCM)*** – Based on the LOS criteria defined in this report the following improvements are recommended:
  - **No. 14 – State College Boulevard at Imperial Highway:** Conduct median modifications and restripe the southbound approach to provide an exclusive southbound right-turn lane. Modify the median and restripe the No. 2 SB left-turn lane into a trap left turn lane. Modify the existing traffic signal, as necessary.
  - **No. 15 – SR-57 Southbound Ramps at Imperial Highway:** Restripe the No. 3 eastbound through lane along Imperial at the SR-57 southbound on-ramp to be converted to a shared through/right-turn lane. Modify the on-ramp to allow for two receiving lanes. Modify the existing traffic signal, as necessary.

- ***Site Access Assessment –*** The intersections of Randolph Avenue at Madison Way, Randolph Avenue at Brea Mall, and Brea Mall South at State College Boulevard are forecast to operate at LOS D or better during the Weekday AM, Weekday PM, and Weekend (Saturday) Midday peak hours in all traffic conditions.

- ***Year 2026 Project Fair-Share Contribution –***The Project can be expected to pay a proportional "fair-share" of the recommended improvements at two (2) degraded intersections, which are identified below. It should be noted that the intersection improvements identified for SR-57 Southbound Ramps at Imperial Highway are part of the City's Capital Improvement Program (CIP), therefore, the Projects contribution towards the City of Brea Traffic Fees may satisfy a

portion of their fair share obligations at this location. It is our understanding that detailed cost estimates will be provided to the City to help determine the exact fair share amount. It should be also be noted that while fair share costs have been calculated Caltrans has no mechanism by which the Project can contribute fair share fees.

| Key Intersection | City/ Jurisdiction | Project Fair-Share Contribution |
|---|---|---|
| 14. State College Boulevard at Imperial Highway | Brea/Caltrans | 19.51% |
| 15. SR-57 SB Ramps at Imperial Highway | Brea/Caltrans | 17.39% |

- ***Traffic Fees*** – The proposed Project's Traffic Fee totals $747,851.00 based on a net increase of 85,425 SF of regional commercial uses along with 383 medium density residential units (i.e. 85,425 SF x $2.24 per SF = $191,352 and 383 DU x $1,453 per DU = $556,499). The precise fee will be determined upon issuance of Project building permits by the City of Brea Community Development Department.

- ***Year 2026 Caltrans Queuing Analysis*** - One (1) of the two (2) study intersections have queues which exceed the provided storage capacity for one or more intersection approach with the addition of proposed Project traffic to Year 2026 cumulative traffic conditions. The remaining study intersection has queues that are adequately accommodated by the provided storage space. The intersections/approaches with storage deficiencies include the following:

    - Intersection No. 14: State College Boulevard at Imperial Highway
        - Southbound Left-Turn: PM Peak Hour and Saturday Midday Peak Hour
        - Westbound Right-Turn: Saturday Midday Peak Hour

  Review of column (3) of *Table 9-1* indicates that the southbound left-turn and westbound right turn at State College Boulevard at Imperial Highway (Intersection No. 14) exceeds the storage capacity and the added project trips would increase these movements by more than one vehicle. However, with the recommended improvements this intersection would operate better than pre-Project conditions for the southbound left-turn. It should be noted that the westbound right-turn has constraints that does not allow for any feasible improvements to be implemented. Therefore, the westbound right-turn pocket will continue to exceed the pocket.

- ***Year 2045 Caltrans Queuing Analysis*** – One (1) of the two (2) study intersections have queues which exceed the provided storage capacity for one or more intersection approach with the addition of proposed Project traffic to Year 2045 buildout traffic conditions. The remaining study intersection has queues that are adequately accommodated by the provided storage space. The intersections/approaches with storage deficiencies include the following:

    - Intersection No. 14: State College Boulevard at Imperial Highway
        - Southbound Left-Turn: PM Peak Hour and Saturday Midday Peak Hour
        - Westbound Right-Turn: Saturday Midday Peak Hour

Review of column (3) of *Table 9-1* indicates that the southbound left-turn and westbound right turn at State College Boulevard at Imperial Highway (Intersection No. 14) exceeds the storage capacity and the added project trips would increase these movements by more than one vehicle. However, with the recommended improvements this intersection would operate better than pre-Project conditions for the southbound left-turn. It should be noted that the westbound right-turn has constraints that does not allow for any feasible improvements to be implemented. Therefore, the westbound right-turn pocket will continue to exceed the pocket.

- ***State College Boulevard at Imperial Highway Focused Assessment*** – A focused safety assessment has been completed at State College Boulevard/Imperial Highway as it relates to vehicles making erratic lane changes to try and enter the SR-57 SB On-Ramp along Imperial Highway. The table below presents the accident data for State College Boulevard at Imperial Highway. Review of this data shows that collisions related to lane changes ranged between 2 to 6 collisions per year. These collisions could be corrected via modifying the SR-57 SB On-Ramp to allow for two lanes onto the freeway. It is recommended that the eastbound approach be modified to accommodate two through lanes, a shared through/right-turn lane and an exclusive right-turn lane.

| **State College Boulevard at Imperial Highway** | | |
|---|---|---|
| ***Time Period*** | ***Total*** | ***Correctable*** |
| 5/16 through 5/17 | 33 | 6 (Lane Change) |
| 5/17 through 5/18 | 26 | 2 (Lane Change) |
| 5/18 through 5/19 | 28 | 3 (Lane Change) |
| 5/19 through 5/20 | 16 | 2 (Lane Change) |
| 5/20 through 5/21 | 19 | 2 (Lane Change) |

# APPENDIX A

## TRAFFIC STUDY SCOPE OF WORK

# MEMORANDUM

| | | | |
|---|---|---|---|
| To: | Dave Roseman, P.E.,<br>City Traffic Engineer<br>City of Brea | Date: | April 4, 2022 |
| From: | Richard E. Barretto, P.E., Principal<br>Linscott, Law & Greenspan, Engineers | LLG Ref: | 2.19.4099.1 |
| Subject: | ***Traffic Circulation Assessment Scope of Work for Brea Mall Mixed-Use Project Brea, California*** | | |

Linscott, Law & Greenspan, Engineers (LLG) is pleased to submit the following Scope of Work for the Traffic Circulation Assessment for the proposed Brea Mall Mixed-Use Project in the City of Brea for your review and approval. It is our understanding that a Traffic Circulation Assessment is required to provide consistency with the General Plan, and further the updated traffic analysis (LOS study) is necessary to evaluate the potential traffic impact of two development options of the proposed Project. The work program summarized below is based on our current experience within the City and prior coordination efforts with City staff. The *Traffic Impact Analysis Report for the Brea Mall Mixed-Use Project, dated January 9, 2020,* which was incorporated in the Project's Draft EIR, will serve as a database and reference for this study to provide consistency with the previously prepared traffic report.

## Circulation Assessment Scope of Work

**A. Project Location:** The Brea Mall Mixed-Use Project is located in the southwest quadrant of the Brea Mall along Randolph Avenue and Imperial Highway in the City of Brea, California. ***Figure 1-1*** presents a Vicinity Map that illustrates the general location of the Project and surrounding street system. ***Figure 2-1*** is an existing aerial photograph of the Project site.

**B. Project Description:**

*Existing Brea Mall*

The existing Brea Mall site is 1,291,433 square feet (SF) of Gross Leasable Area (GLA) consisting of several major department stores and a mixture of retail shops and restaurant/food uses. It should be noted that the first floor of the vacant Sears department store has been re-occupied by Q's fashion retail store and the second story totaling 80,995 GLA SF is currently still vacant.

*Proposed Project*

The retail component of the proposed Project, up to 247,415 SF of additional retail space, inclusive of a 50,000 SF sporting goods store and a 128,000 SF health club will be constructed. The residential component of the proposed Project, which would be developed south of the Nordstrom's parking structure,

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Jack M. Greenspan, PE (Ret.)
William A. Law, PE (Ret.)
Paul W. Wilkinson, PE
John P. Keating, PE
David S. Shender, PE
John A. Boarman, PE
Clare M. Look-Jaeger, PE
Richard E. Barretto, PE
Keil D. Maberry, PE

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includes the development of a seven-story, 441,027 SF apartment podium with up to 383 apartment homes consisting of 28 studio units, 215 one-bedroom units and 140 two-bedroom units.

***Table 2-1*** provides the Project development summary. A review of *Table 2-1* indicates that upon completion of the Project, Brea Mall will have total GLA of 1,376,858 SF and a 383-unit apartment community.

**C. Traffic Study Locations:** The following twenty-nine (29) key study intersections were identified for analysis based on the prior traffic study for the Brea Mall.

***Key Study Intersections***

1. Puente Street at Lambert Road
2. Brea Boulevard at Lambert Road
3. State College Boulevard at Lambert Road
4. SR-57 SB Ramps at Lambert Road
5. SR-57 NB Ramps at Lambert Road
6. Santa Fe Road/Kraemer Boulevard at Lambert Road
7. Brea Boulevard at Birch Street
8. Randolph Avenue at Birch Street
9. State College Boulevard at Birch Street
10. S Associated Road at Birch Street
11. N Associated Road at Birch Street
12. Kraemer Boulevard at Birch Street
13. Randolph Avenue at Madison Way
14. Randolph Avenue at Brea Mall
15. Brea Mall South at State College Boulevard
16. Harbor Boulevard at Imperial Highway
17. Puente Street at Imperial Highway
18. Brea Boulevard at Imperial Highway
19. Randolph Avenue at Imperial Highway
20. State College Boulevard at Imperial Highway
21. SR-57 SB Ramps at Imperial Highway
22. SR-57 NB Ramps at Imperial Highway
23. Associated Road at Imperial Highway
24. Castlegate Lane/Placentia Avenue at Imperial Highway
25. Kraemer Boulevard at Imperial Highway

26. Brea Boulevard at Bastanchury Road
27. State College Boulevard at Bastanchury Road
28. Placentia Avenue at Bastanchury Road
29. Kraemer Boulevard at Bastanchury Road

As a result of SB743, traffic studies are no longer a CEQA requirement. Based on discussion with City staff, the following eighteen (18) study locations are recommended for evaluation. Subject to confirmation by the City Traffic Engineer, Level of Service (LOS) calculations would be prepared at these locations:

***Key Study Intersections***

3. State College Boulevard at Lambert Road
4. SR-57 SB Ramps at Lambert Road
5. SR-57 NB Ramps at Lambert Road
8. Randolph Avenue at Birch Street
9. State College Boulevard at Birch Street
10. S Associated Road at Birch Street
13. Randolph Avenue at Madison Way
14. Randolph Avenue at Brea Mall
15. Brea Mall South at State College Boulevard
16. Harbor Boulevard at Imperial Highway[1]
17. Puente Street at Imperial Highway
18. Brea Boulevard at Imperial Highway
19. Randolph Avenue at Imperial Highway
20. State College Boulevard at Imperial Highway[1]
21. SR-57 SB Ramps at Imperial Highway[1]
22. SR-57 NB Ramps at Imperial Highway[1]
23. Associated Road at Imperial Highway
24. Castlegate Lane/Placentia Avenue at Imperial Highway

*Figure 1-1* identifies the study locations.

**D. Traffic Counts:** Based on current conditions, due to COVID-19 virus, the ability to collect traffic counts to establish baseline conditions is not possible. As such, to establish existing "baseline" traffic conditions, pre-COVID-19, LLG has

[1] Orange County Congestion Management Program (CMP) intersection.

researched historical data and was able to obtain Year 2018/2019 counts at all eighteen (18) key study locations. As such, to establish existing "baseline" traffic conditions and to account for recently occupied developments such as In-N-Out which is located at Randolph Avenue and Imperial Highway, a conservative growth factor of 5% will be applied to the Year 2018/2019 conditions to establish Year 2021 pre-COVID-19 baseline traffic conditions.

**E. Project Traffic Generation:** The trip generation potential of the proposed Project will be estimated using trip rates contained in the 10th Edition of *Trip Generation,* published by the Institute of Transportation Engineers (ITE), [Washington, D.C., 2017].

***Table 5-1*** summarizes the trip generation rates used in forecasting the vehicular trips generated by the proposed Project and also presents the project's forecast peak hour and daily traffic volumes. As shown in the upper portion of *Table 5-1***,** ITE Land Use 221: Multifamily Housing (Mid-Rise) trip rates and ITE Land Use 820: Shopping Center equations, and empirical rates from existing Lifetime Fitness facilities will be used to forecast the trip generation potential of a fully occupied existing Brea Mall and site as well as the Project.

A review of the middle portion of *Table 5-1* indicates that a fully occupied Brea Mall (including the currently vacant second story of Sears) (Row B) is forecast to generate approximately 30,817 Weekday daily trips, with 757 trips (469 inbound, 288 outbound) produced in the Weekday AM peak hour and 3,247 trips (1,559 inbound, 1,688 outbound) produced in the Weekday PM peak hour on a "typical" weekday. A fully occupied Brea Mall is forecast to generate 39,183 Saturday daily trips, with 4,204 trips (2,186 inbound, 2,018 outbound) produced in the Saturday Midday peak hour on a "typical" Saturday.

The lower portion of *Table 5-1* presents the trip generation associated with the existing occupied Brea Mall and the additional proposed Project uses (Row C). A review of the lower portion of this table indicates that the proposed Project with the existing Brea Mall is forecast to generate approximately 33,976 Weekday daily trips, with 1,067 trips (622 inbound, 445 outbound) produced in the Weekday AM peak hour and 3,556 trips (1,789 inbound, 1,767 outbound) produced in the Weekday PM peak hour on a "typical" weekday. The proposed Project with the existing Brea Mall is forecast to generate 42,060 Saturday daily trips, with 4,484 trips (2,274 inbound, 2,210 outbound) produced in the Saturday Midday peak hour on a "typical" Saturday.

When the proposed Project is compared to an existing fully occupied Brea Mall site, the proposed Project is forecast to generate 3,159 more Weekday daily trips,

310 more Weekday AM peak hour trips, 309 more Weekday PM peak hour trips, 2,877 more Saturday daily trips, and 280 more Saturday Midday peak hour trips. The potential impact of these added Project trips will be evaluated in the traffic analysis.

**F. Project Trip Distribution Pattern:** See attached ***Figures 5-1*** and ***5-2*** for the commercial and residential components, respectively, for review by the City. The project trip distributions have been distributed and assigned to the adjacent street system based on the following considerations:

- Recognition that the Brea Mall draws traffic from the surrounding region and is not just a local area attraction.
- location of site access points in relation to the surrounding street system,
- the site's immediate proximity to major traffic carriers and regional access routes, such as the SR-57 Freeway and SR-90 (Imperial Highway),
- physical characteristics of the circulation system such as lane channelization and presence of traffic signals that affect travel patterns,
- presence of traffic congestion in the surrounding vicinity,
- ingress/egress availability at the project site, and
- input by City Staff.

**G. Near-Term Cumulative Background Traffic:**

- Project Completion Year: 2026
- Ambient Growth Rate: 1% per year
- Cumulative Projects: Planned and/or approved projects are presented in ***Table 6-1.***

**H. General Plan Buildout Traffic:** General Plan Buildout (Year 2045) traffic volume forecasts will be developed based on OCTAM 5.0 approved computer traffic model runs for baseline conditions and buildout conditions for the AM and PM peak periods and daily traffic conditions. Forecast future buildout traffic volumes using the following methodology:

a. Peak period traffic volumes will be converted to peak hour (i.e., one-hour) traffic volumes using a conversion factor of 0.3566 for the AM peak hour and 0.2662 for the PM peak hour;
b. Calculate the difference between the baseline and buildout peak period traffic volumes and convert to AM and PM peak hour (i.e., one-hour) link traffic volumes;
c. Link traffic volumes (i.e., two-way directional traffic volumes on each roadway segment) will be post-processed using the "b-turns" program and the relationship of the base year validation model run output to the base

year "ground" traffic counts to develop buildout AM and PM peak hour traffic volumes.

**I. Analysis Scenarios:** Prepare Weekday AM, PM and Saturday Midday peak hour Level of Service (LOS) calculations at the eighteen (18) key study intersections to determine the potential impacts of the proposed Project. The following traffic scenarios will be prepared.

1. Existing Baseline (Existing + Fully Occupied Mall) Traffic Conditions;
2. Near-Term (Year 2026) Background Traffic Conditions (Existing plus Ambient Growth plus Related Projects);
3. Near-Term (Year 2026) Background Plus Project Traffic Conditions;
4. Scenario (3) with improvements to be implemented as conditions of approval (COA), if necessary;
5. General Plan Buildout[2] (Year 2045) Traffic Conditions;
6. General Plan Buildout (Year 2045) Plus Project Traffic Conditions; and
7. Scenario (8) with improvements to be implemented as conditions of approval (COA), if necessary.

**J. LOS Methodology:** The LOS calculations will be based on the HCM 6th Edition methodology for both signalized and unsignalized intersections to be consistent with the City of Brea Transportation Impact Analysis (TIA) Guidelines. Additionally, the LOS calculations will also be based on the Intersection Capacity Utilization (ICU) methodology for signalized intersections to be consistent with the City of Brea General Plan.

The HCM calculations will utilize the following parameters:

- Utilization of exiting cycle length and pedestrian timing parameters,
- Minimum left-turn split time, including clearance interval timing = 10 seconds
- Saturation flow rates:
  - Thru and Right-turns = 1,900 vehicles per hour (vph)
  - Left-turns = Single Lane: 1,800 vph, Dual Lanes = 3,500 vph

The ICU calculations will utilize the following parameters:

- Lane capacity of 1,700 vph for through and all turn lanes with a clearance adjustment factor of 0.05

Subject to confirmation by the City Traffic Engineer, the following LOS review criteria will be used to assess the need for potential Project-related improvements in relation to the guidance provided in the City of Brea General Plan:

[2] It should be noted that the General Plan Buildout assessment has been included since the proposed Project would require an amendment to the General Plan to accommodate a change is Zoning to allow for residential uses.

- HCM Methodology:
  - The Project causes one or more study intersections operating at LOS D or better to degrade to LOS E or F, or
  - The Project causes a change in control delay of 4 seconds for intersections already operating at LOS E, or
  - The Project causes a change in control delay of 2 seconds for intersections already operating at LOS F.

- ICU Methodology:
  - The Project causes an intersection operating at LOS D or better to degrade to LOS E or F, or
  - The Project increases traffic demand at a signalized study intersection by 0.020 or greater and the intersection is forecast to operate at LOS E or F.

**K. Other Issues:**

- Evaluate site access and internal circulation of the proposed Project
- Conduct a queuing evaluation at Project driveways to assess internal circulation needs.
- Conduct a safety evaluation at all key study intersections which will include 5 years of collision history data. Recommend physical and/or timing changes to improve safety where applicable.
- Conduct a queuing evaluation at all key study intersections located along Imperial Highway, inclusive of the SR-57 off-ramps to Imperial Highway to address potential Caltrans concerns/comments.
- Perform an active transportation facilities assessment of the near-by roadways as it relates to pedestrian mobility and bicycle mobility.
- Provide documentation of existing near-by transit facilities and transit routes that provide services to the site, as well as document existing bikeway facilities/trails.
- Prepare a standalone VMT screening memo.

LINSCOTT LAW & GREENSPAN engineers

*  *  *  *  *  *  *  *  *  *

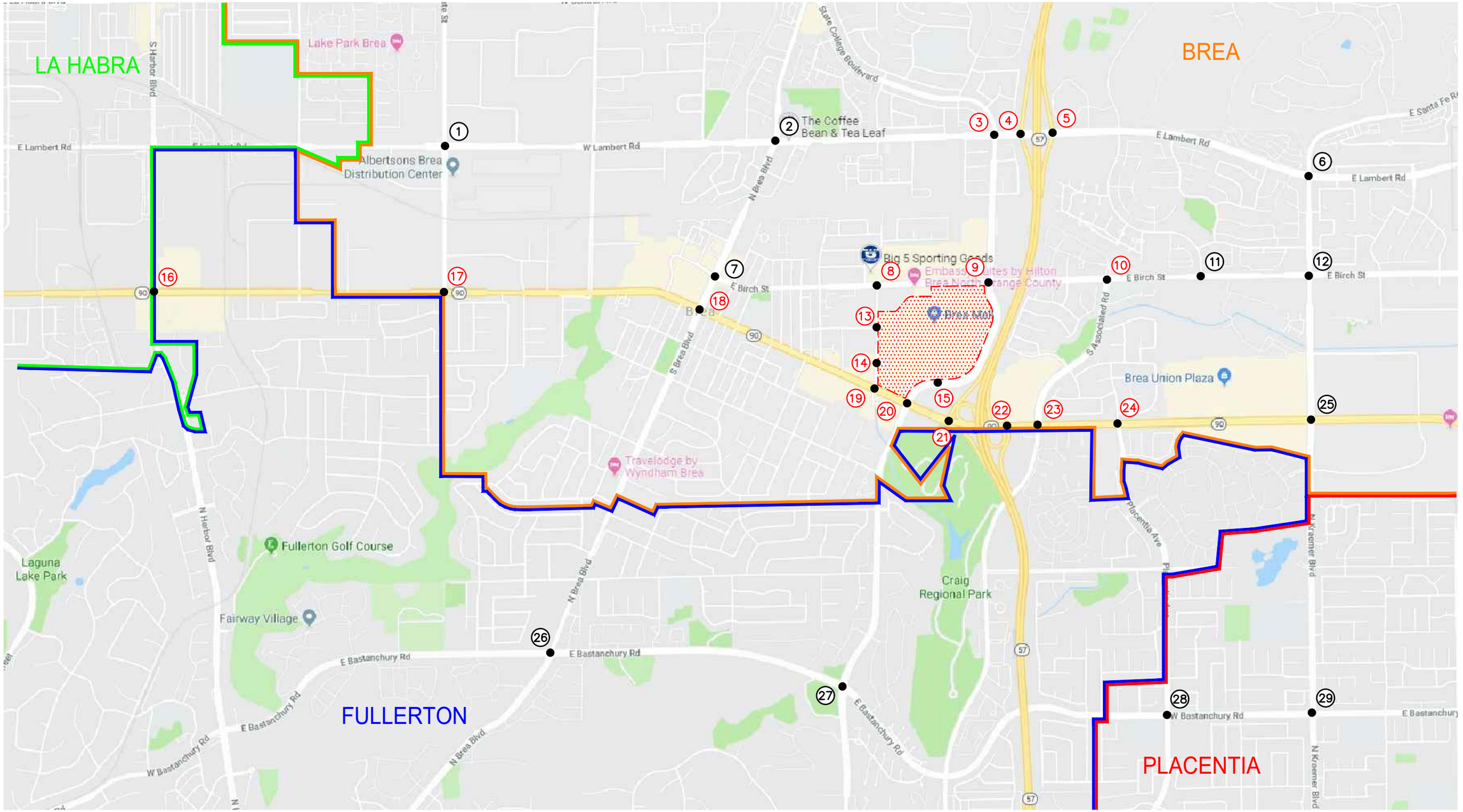
We appreciate the opportunity to provide this scope of work. Should you have any questions, please call us at (949)825-6175. Thank you.

**Approved by:**

_____ _____

City of Brea  Date

cc. File
Shane Green, P.E., LLG




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N NO SCALE

SOURCE: GOOGLE

KEY

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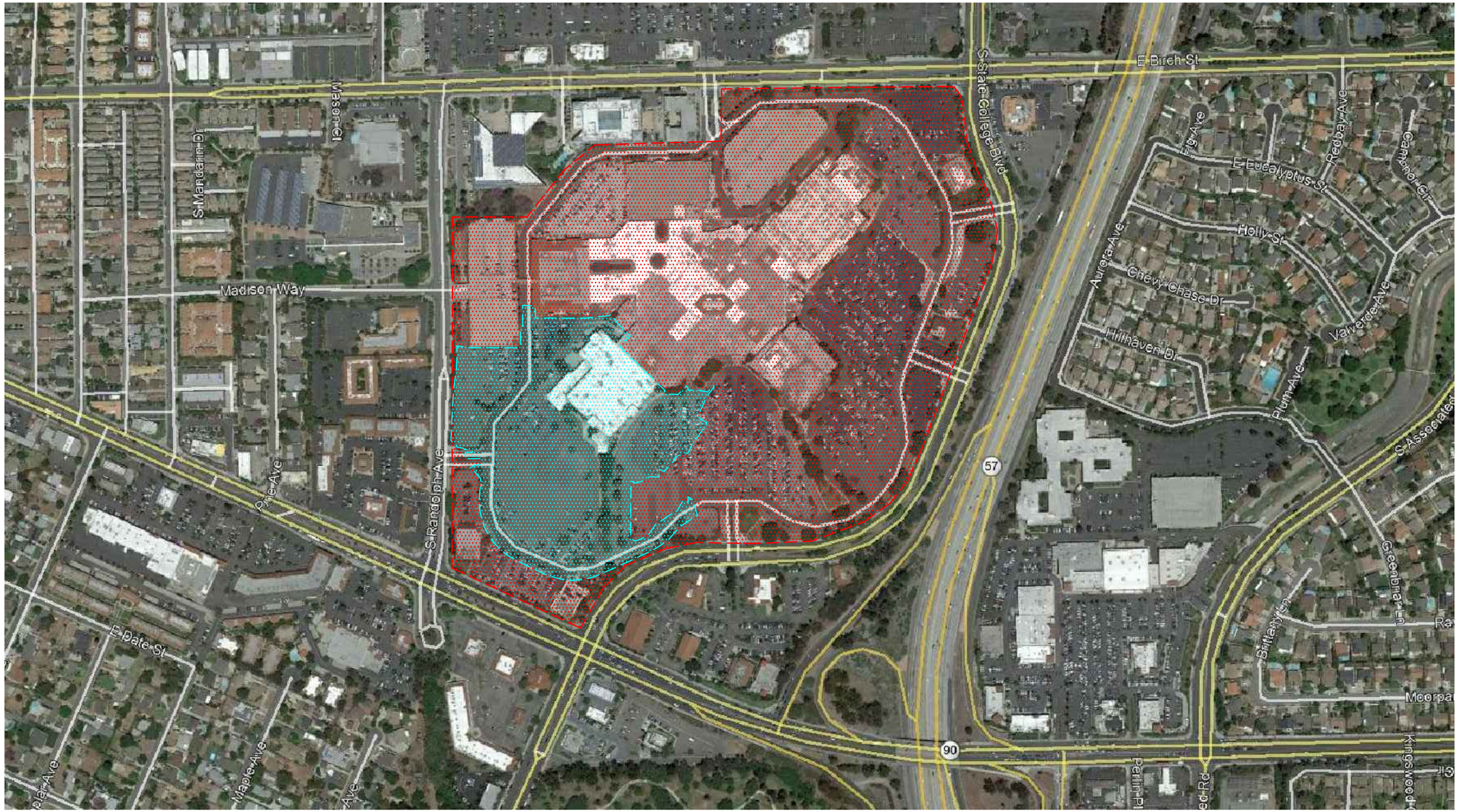
(#) = RECOMMENDED STUDY INTERSECTION

= PROJECT SITE

# FIGURE 1-1

## VICINITY MAP

BREA MALL MIXED-USE PROJECT, BREA




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SOURCE: GOOGLE

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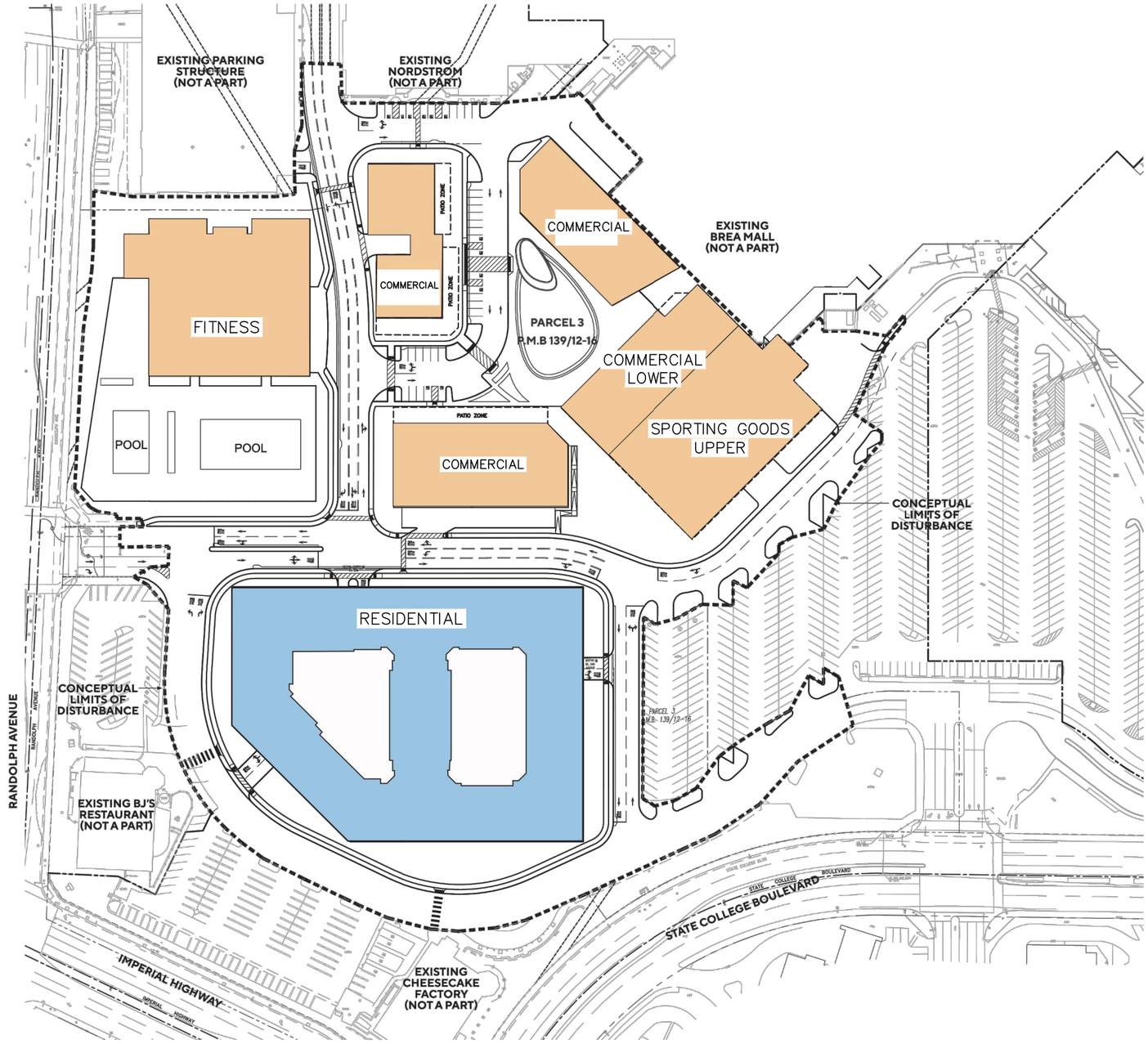
= BREA MALL

= PROJECT SITE

# FIGURE 2-1

## EXISTING AERIAL PHOTOGRAPH

BREA MALL MIXED-USE PROJECT, BREA




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SOURCE: ARCHITECTURE AND DESIGN FIRM AO

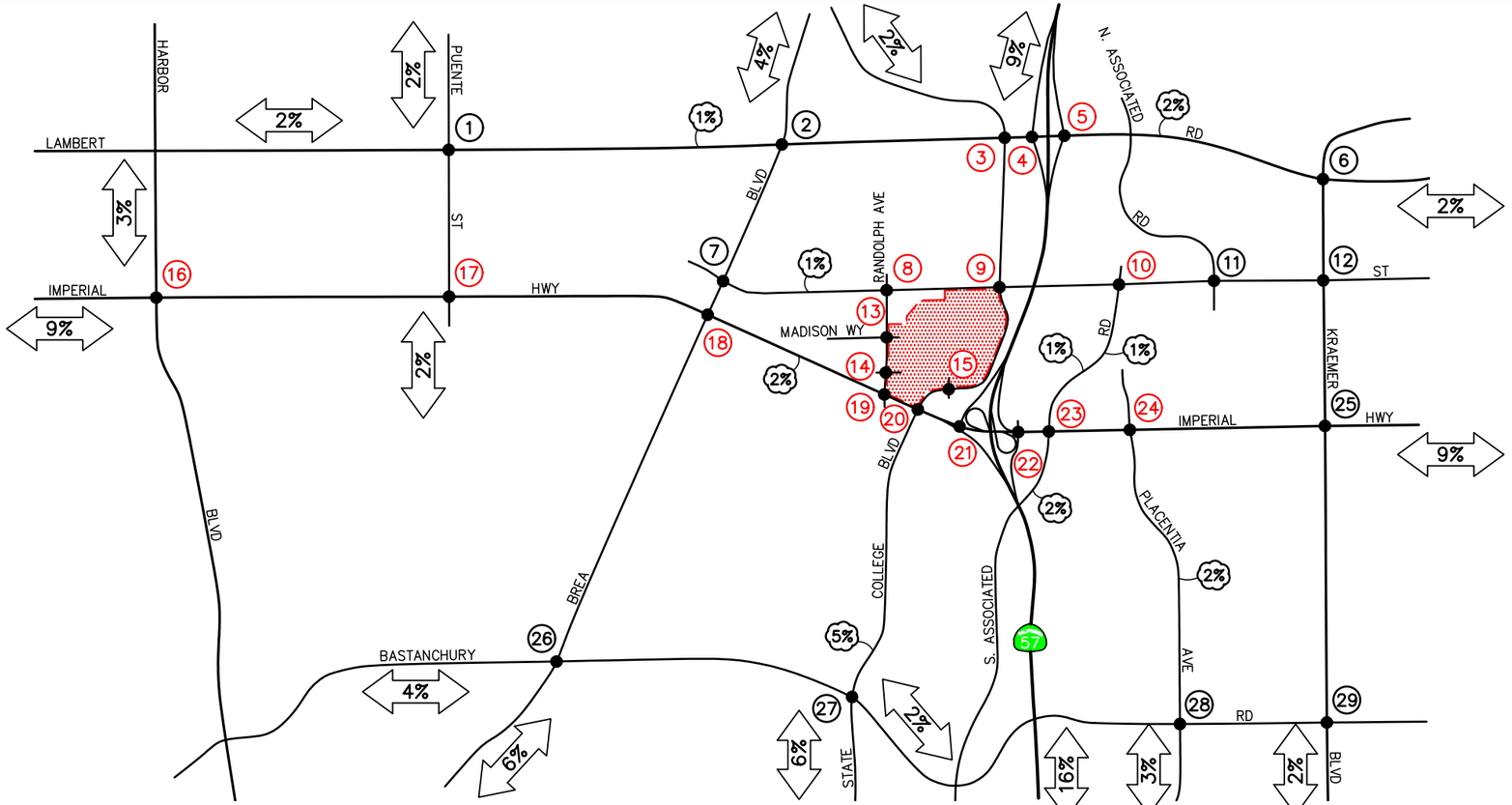
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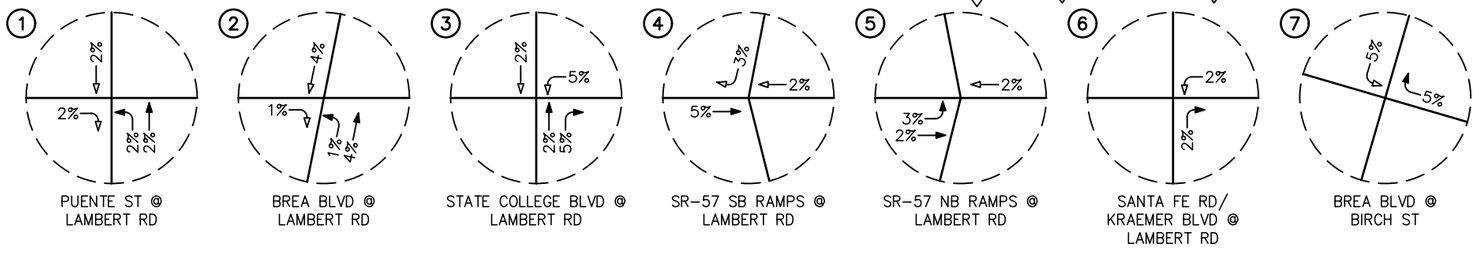
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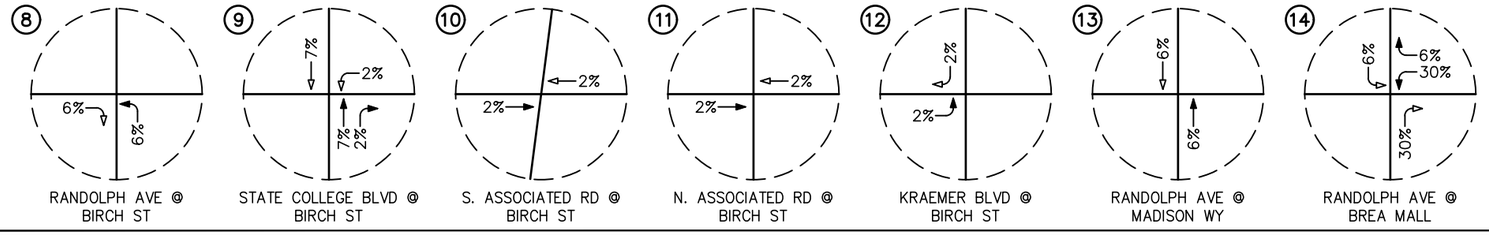
# FIGURE 2-2

**PROPOSED SITE PLAN**

BREA MALL EXPANSION & IMPROVEMENT, BREA




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KEY

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(#) = RECOMMENDED STUDY INTERSECTION

= INBOUND PERCENTAGE

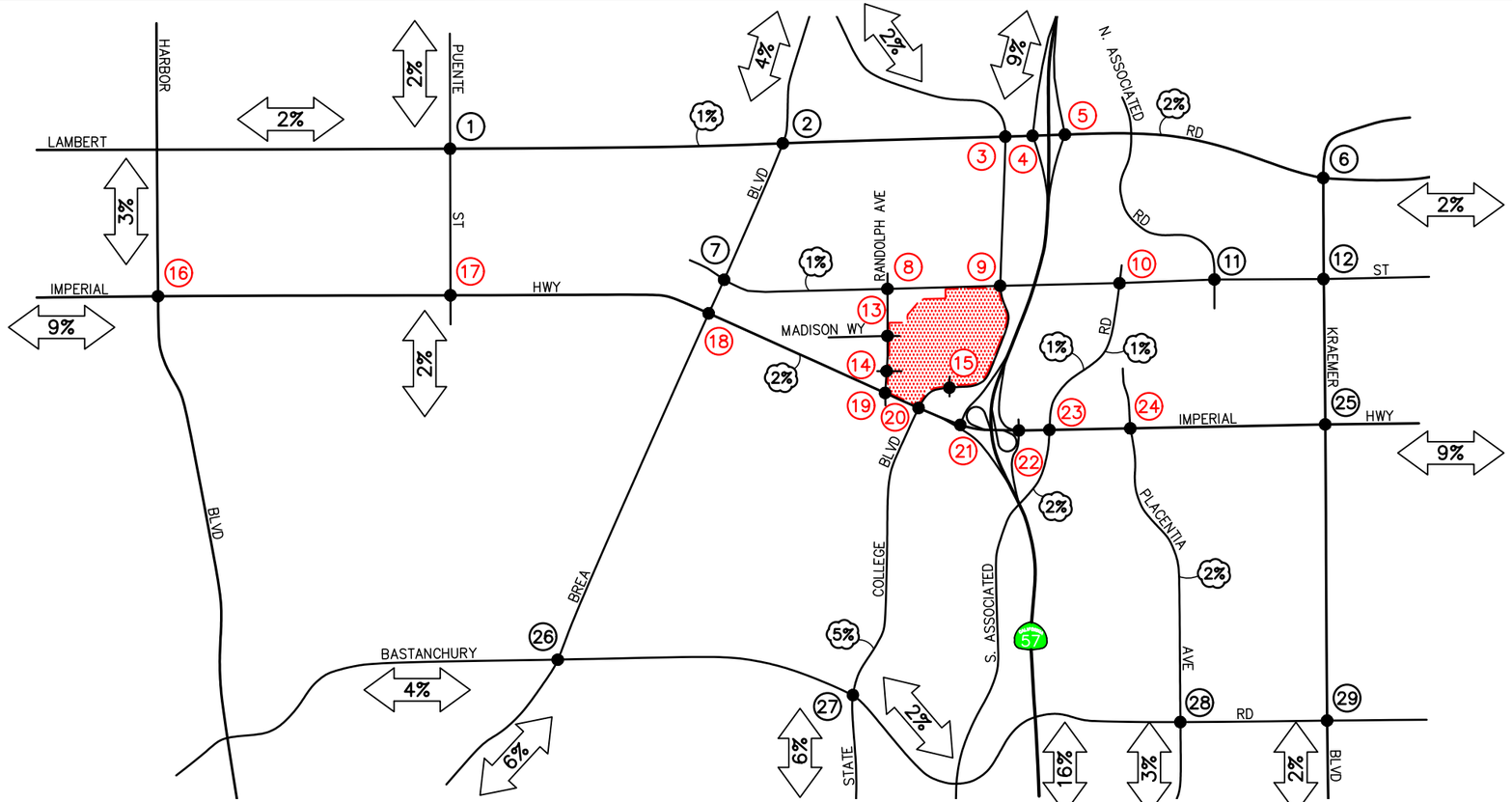
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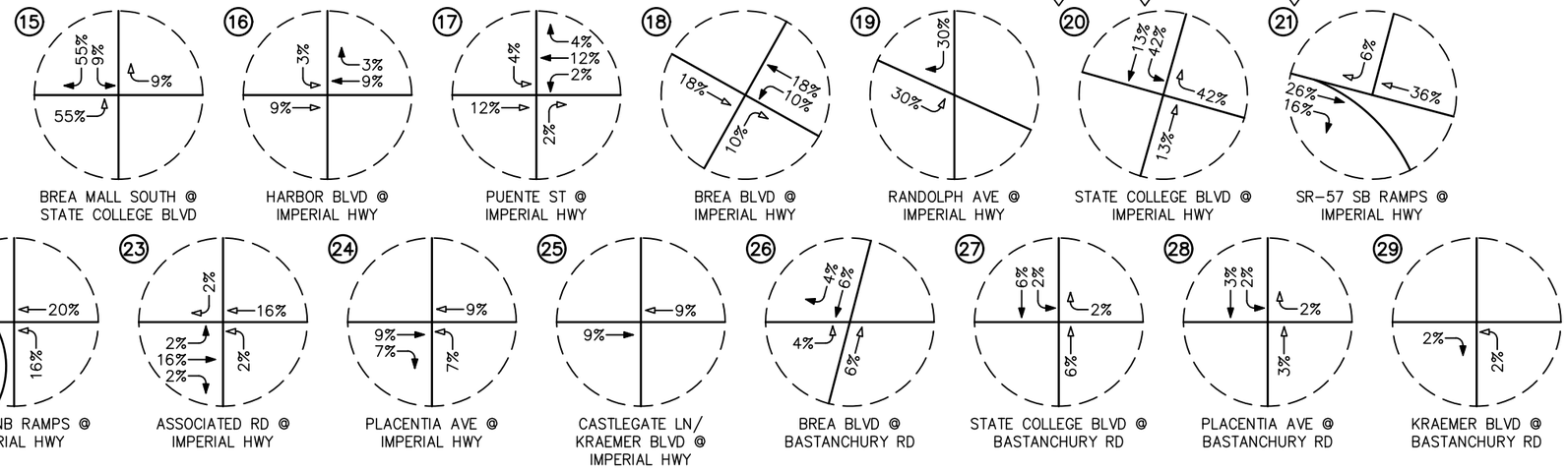
= PROJECT SITE

# FIGURE 5-1A

## PROJECT TRIP DISTIBUTION – COMMERCIAL

BREA MALL MIXED-USE PROJECT, BREA




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KEY

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(#) = RECOMMENDED STUDY INTERSECTION

= INBOUND PERCENTAGE

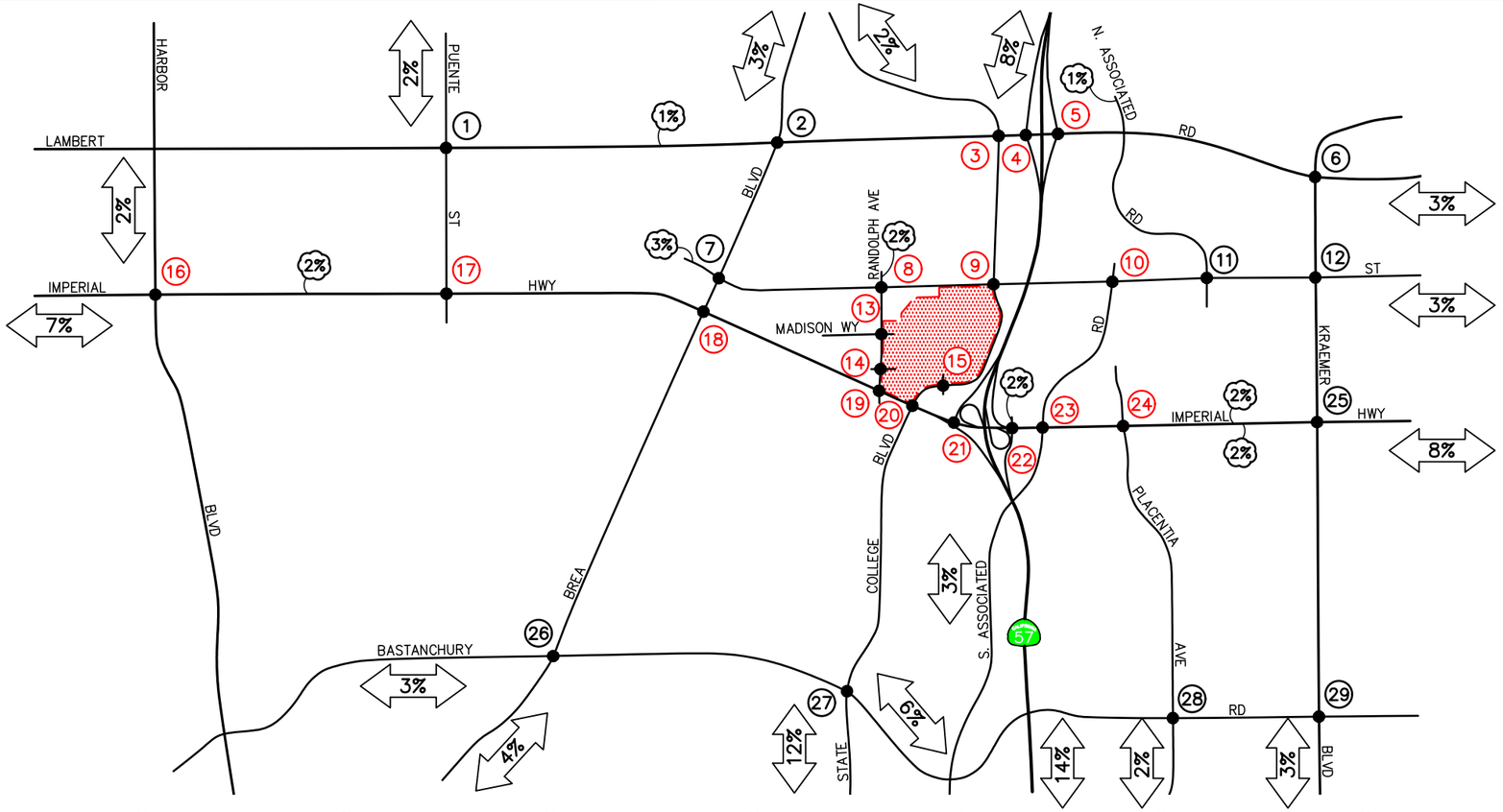
= OUTBOUND PERCENTAGE

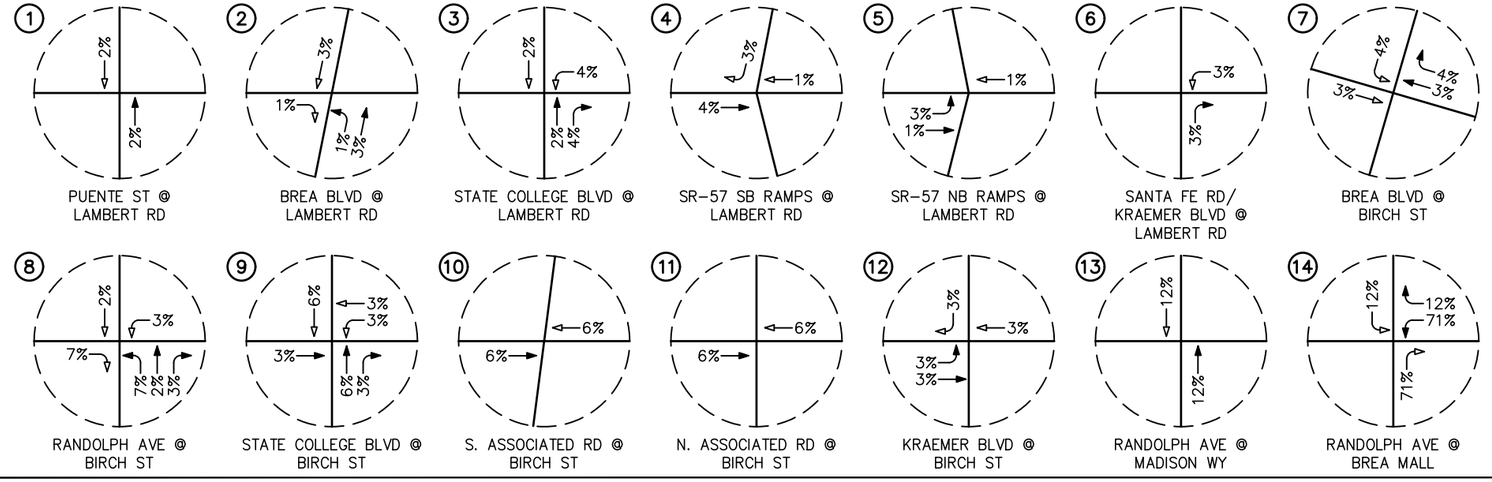
= PROJECT SITE

# FIGURE 5-1B

## PROJECT TRIP DISTRIBUTION – COMMERCIAL

BREA MALL MIXED-USE PROJECT, BREA




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KEY

(#) = STUDY INTERSECTION BASED ON PRIOR BREA MALL STUDY

(#) = RECOMMENDED STUDY INTERSECTION

⇦ = INBOUND PERCENTAGE

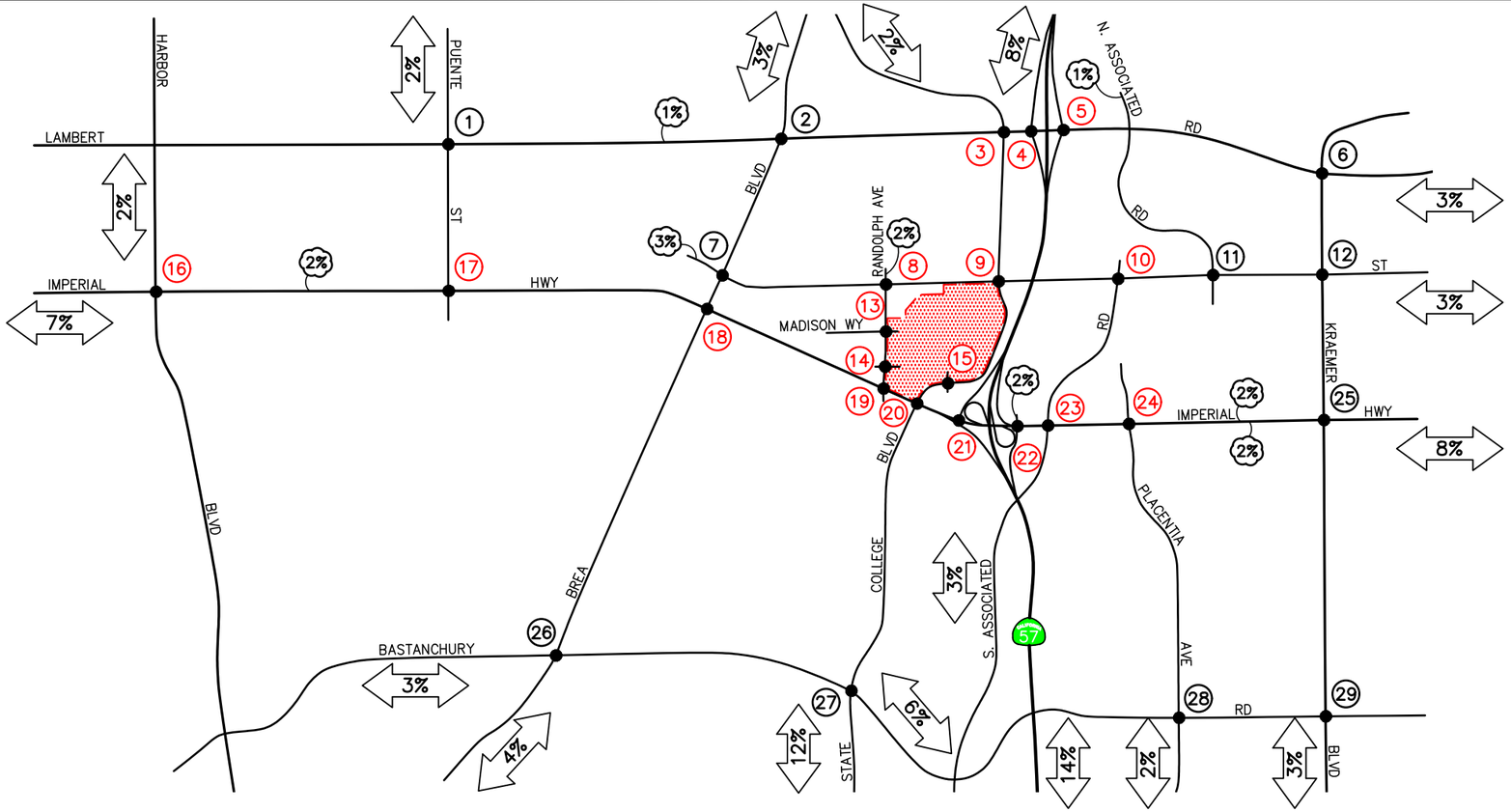
⇦ = OUTBOUND PERCENTAGE

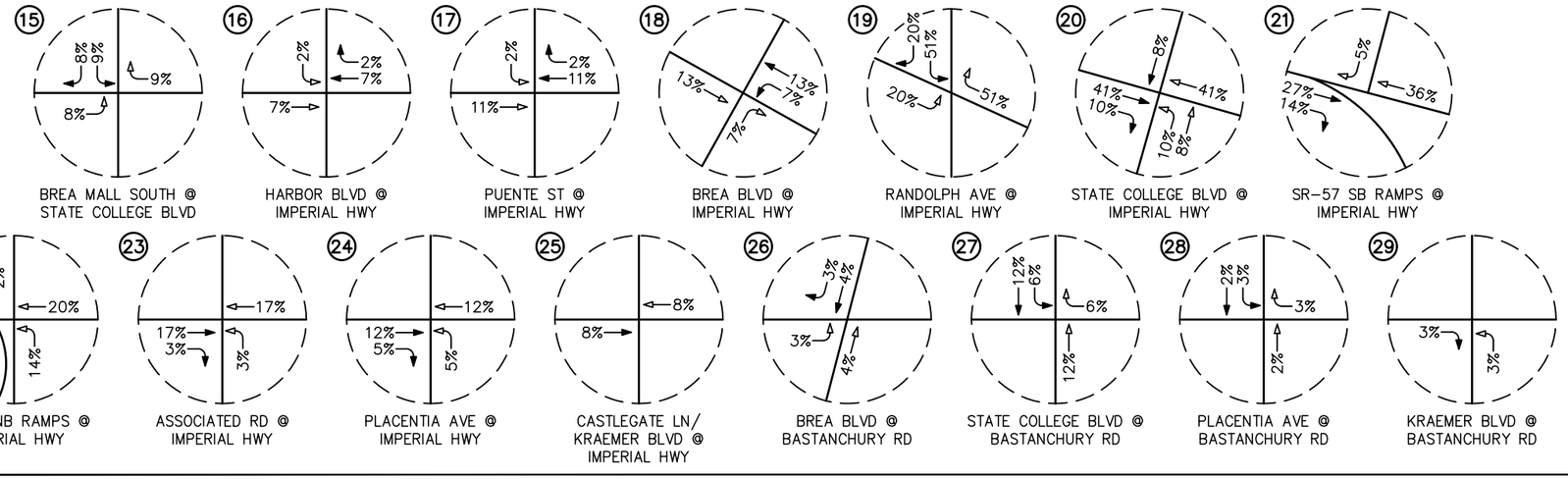
▭ = PROJECT SITE

# FIGURE 5-2A

## PROJECT TRIP DISTRIBUTION – RESIDENTIAL

BREA MALL MIXED-USE PROJECT, BREA




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N NO SCALE

KEY

(#) = STUDY INTERSECTION BASED ON PRIOR BREA MALL STUDY

(#) = RECOMMENDED STUDY INTERSECTION

⟵ = INBOUND PERCENTAGE

⟵ = OUTBOUND PERCENTAGE

▭ = PROJECT SITE

# FIGURE 5-2B

## PROJECT TRIP DISTRIBUTION – RESIDENTIAL

BREA MALL MIXED-USE PROJECT, BREA

**TABLE 2-1**

**PROJECT DEVELOPMENT SUMMARY**

| Land Use/Project Description | Development Totals |
|---|---|
| ***Existing Occupied Brea Mall:*** | |
| ▪ Existing Occupied Mall | 1,210,438 SF GLA |
| ***Existing Occupied Brea Mall + Vacancy:*** | |
| ▪ Existing Occupied Mall | 1,210,438 SF GLA |
| ▪ Vacant Second Story Sears Tenant | 80,995 SF GLA |
| *Fully Occupied Brea Mall* | *1,291,433 SF GLA* |
| ***Existing Occupied Brea Mall + Proposed Project:*** | |
| ▪ Existing Occupied Mall | 1,210,438 SF GLA |
| ▪ Existing Occupied Mall to be Demolished | -80,995 SF GLA |
| ▪ Proposed Project Commercial[3] | |
| o Sporting Goods | 50,000 SF GLA |
| o Fitness Center | 128,000 SF GLA |
| o Non-Anchor Mall Retail | 69,415 SF GLA |
| *Existing Occupied Brea Mall + Proposed Project Subtotal* | *1,376,858 SF GLA* |
| ▪ Proposed Project Multifamily Homes[4] | |
| o Studio | 28 Units |
| o 1 Bedroom | 215 Units |
| o 2 Bedroom | 140 Units |
| *Proposed Residential* | *383 Units* |

[3] *Table 3-2 Brea Mall Mixed Use Project Land Use Summary,* received December 2, 2021.
[4] *Table 3-3A Residential Building A Summary,* received December 2, 2021.

## TABLE 5-1
## PROJECT TRAFFIC GENERATION RATES AND FORECAST[5]

| ITE Land Use Code/ Project Description | Weekday | | | | | | | Saturday | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Daily | AM Peak Hour | | | PM Peak Hour | | | Daily | MD Peak Hour | | |
| | 2-Way | Enter | Exit | Total | Enter | Exit | Total | 2-Way | Enter | Exit | Total |
| ***Trip Generation Factors:*** | | | | | | | | | | | |
| • 221: Multifamily Housing (Mid-Rise) (TE/DU)[6] | 5.44 | 26% | 74% | 0.36 | 61% | 39% | 0.44 | 4.91 | 49% | 51% | 0.44 |
| • 820: Shopping Center (TE/TSF GLA) | Eq.[7] | 62% | 38% | Eq.[7] | 48% | 52% | Eq.[7] | Eq.[7] | 52% | 48% | Eq.[7] |
| • Health Club (TE/TSF)[8] | 27.44 | 1.02 | 0.51 | 1.53 | 1.85 | 0.97 | 2.83 | 26.35 | 1.04 | 1.79 | 2.83 |
| ***[A] Existing Occupied Brea Mall:*** | | | | | | | | | | | |
| • Existing Shopping Center (1,210,438 SF) | 32,766 | 469 | 288 | 757 | 1,651 | 1,788 | 3,439 | 41,824 | 2,308 | 2,130 | 4,438 |
| Pass-by Reduction[9] | -3,277 | -23 | -15 | -38 | -165 | -179 | -344 | -4,182 | -231 | -213 | -444 |
| ***Existing Occupied Brea Mall Subtotal*** | ***29,489*** | ***446*** | ***273*** | ***719*** | ***1,486*** | ***1,609*** | ***3,095*** | ***37,642*** | ***2,077*** | ***1,917*** | ***3,994*** |
| ***[B] Existing Occupied Brea Mall + Vacancy:*** | | | | | | | | | | | |
| • Fully Occupied Shopping Center (1,291,433 SF)[10] | 34,241 | 494 | 303 | 797 | 1,732 | 1,876 | 3,608 | 43,537 | 2,429 | 2,242 | 4,671 |
| Pass-by Reduction[9] | -3,424 | -25 | -15 | -40 | -173 | -188 | -361 | -4,354 | -243 | -224 | -467 |
| ***Fully Occupied Brea Mall Total*** | ***30,817*** | ***469*** | ***288*** | ***757*** | ***1,559*** | ***1,688*** | ***3,247*** | ***39,183*** | ***2,186*** | ***2,018*** | ***4,204*** |
| ***[C] Existing Occupied Brea Mall + Proposed Project:*** | | | | | | | | | | | |
| • Proposed Shopping Center (1,248,858 SF)[11] | 33,469 | 481 | 295 | 776 | 1,690 | 1,830 | 3,520 | 42,642 | 2,365 | 2,184 | 4,549 |
| Internal Capture[12] | -917 | -1 | -1 | -2 | -28 | -47 | -75 | -827 | -36 | -38 | -74 |
| *Proposed Shopping Center Subtotal* | *32,552* | *480* | *294* | *774* | *1,662* | *1,783* | *3,445* | *41,815* | *2,329* | *2,146* | *4,475* |
| Pass-by Reduction[9] | -3,255 | -24 | -15 | -39 | -166 | -179 | -345 | -4,182 | -233 | -215 | -448 |
| *Proposed Shopping Center Subtotal* | *29,297* | *456* | *279* | *735* | *1,496* | *1,604* | *3,100* | *37,633* | *2,096* | *1,931* | *4,027* |
| • Proposed Health Club (128,000 SF) | 3,512 | 131 | 65 | 196 | 237 | 125 | 362 | 3,373 | 133 | 229 | 362 |
| • Proposed Residential (383 DU) | 2,084 | 36 | 102 | 138 | 103 | 66 | 169 | 1,881 | 83 | 86 | 169 |
| Internal Capture[12] | -917 | -1 | -1 | -2 | -47 | -28 | -75 | -827 | -38 | -36 | -74 |
| *Proposed Residential Subtotal* | *1,167* | *35* | *101* | *136* | *56* | *38* | *94* | *1,054* | *45* | *50* | *95* |
| ***[C] Existing Occupied Brea Mall + Proposed Project Total*** | ***33,976*** | ***622*** | ***445*** | ***1,067*** | ***1,789*** | ***1,767*** | ***3,556*** | ***42,060*** | ***2,274*** | ***2,210*** | ***4,484*** |
| **[D] Net Trip Generation [C] (Existing Occupied Brea Mall + Proposed Project) – [B] (Existing Occupied Brea Mall + Vacancy)** | **3,159** | **153** | **157** | **310** | **230** | **79** | **309** | **2,877** | **88** | **192** | **280** |

**Notes:**
TE/DU = Trip End per Dwelling Unit
TE/TSF GLA = Trip End per Thousand Square Feet Gross Leasable Area
TE/TSF = Trip End per Thousand Square Feet

5 Source: *Trip Generation*, 10th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2017).
6 Mid-Rise Multifamily Housing consists of buildings that are between 3 and 10 levels.
7 Trip Generation rates based on the following equations:
- Weekday Daily: Ln(T) = 0.68Ln(X) + 5.57
- Weekday AM Peak Hour: T = 0.50(X) + 151.78
- Weekday PM Peak Hour: Ln(T) = 0.74Ln(X) + 2.89
- Saturday Daily: Ln(T) = 0.62Ln(X) + 6.24
- Saturday Peak Hour of Generator: Ln(T) = 0.79Ln(X) + 2.79

8 Source: *Northshore Mall Redevelopment Traffic Impact and Access Study,* prepared by vhb, dated April 2018. As there is no Sunday Daily and Sunday Midday peak hour empirical rates available, Saturday Daily and Saturday Midday peak hour empirical rates have been applied.
9 The pass-by trip reductions applied to retail trips are 10% for Weekday Daily, 5% for Weekday AM peak hour, 10% for Weekday PM peak hour, 10% for Saturday Daily, 10% for Saturday Midday peak hour, 10% for Sunday Daily, and 10% for Sunday Midday peak hour.
10 The fully occupied Brea Mall includes the existing 1,210,438 SF of occupied mall and 80,995 SF of second floor Sears vacancy.
11 The proposed Brea Mall includes the existing 1,210,438 SF of occupied mall, 80,995 SF of the occupied first floor of the Sears building to be demolished, and 119,415 SF of additional commercial.
12 Consistent with the *Trip Generation Handbook,* published by ITE (2017), Project trip generation was adjusted to account for internal capture between the retail and residential components of the Project. As there is no Saturday or Sunday internal capture worksheets available, Weekday Daily and Weekday PM peak hour calculations have been applied to Saturday Daily, Saturday Midday peak hour, Sunday Daily, and Sunday Midday peak hour.

## TABLE 6-1

## LOCATION AND DESCRIPTION OF CUMULATIVE PROJECTS[13]

| No. | Description | Location/Address | Size |
|---|---|---|---|
| ***City of Brea*** | | | |
| 1. | CVS | 390 N. Brea Boulevard | 13,000 SF Pharmacy with Drive-Through, 1,700 SF Coffee Shop with Drive-through |
| 2. | Brea Place | State College Boulevard at Birch Street | 653 DU Apartments, 5,000 SF Office, 150 Room Hotel[14] |
| 3. | Downtown Hotel | 220 S. Brea Boulevard | 116 Room Hotel, 4,000 SF High Turnover Sit Down Restaurant |
| 4. | Mercury Apartments | Southeast corner of Berry Street at Mercury Lane | 120 DU Apartments |
| 5. | Brea 265 Specific Plan[15] | South of Lambert Road/Carbon Canyon Road, north of Rose Drive, east of Valencia Avenue and west of Carbon Canyon Regional Park | 1,100 residential units, consisting of 450 single-family homes and 650 multi-family residential units, and a 13-acre sports park |
| 6. | Brea Plaza | 409-477 S. Associated Road and 1555, 1609, 1623, 1643 E. Imperial Highway | Demolition of an existing 18,450 SF movie theater and the construction of a mixed-use development with 21,355 SF of office space and 229[16] apartment units |
| 7. | Central Park Village | 340-420 W. Central Avenue | 62 DU townhomes and 20 DU apartments[17] |
| 8. | New Industrial Building | 201 N. Berry Street | 109,125 SF warehouse |
| 9. | Alvero Assisted Living | 251 S. Randolph Avenue | 80 rooms with 82 beds residential care facility |
| 10. | Extra Space Self Storage | 2700 E. Imperial Highway | 126,546 self-storage facility |
| 11. | Brea Imperial Center | 391 S. State College Boulevard | 5,000 SF restaurant, 2,300 SF bagel/coffee shop, 1,600 SF café, 3,867 SF In-N-Out, 28,145 SF retail, and 4,400 SF bank to replace existing land uses which include 4,050 SF food uses, 24,481 SF retail, 4,400 SF bank, 2,325 SF medical office, 10,074 SF health studio spa. |
| 12. | Transwestern | 285 S. Berry Street and 711 W. Imperial Highway | 126,797 SF warehouse |
| 13. | The Phoenix Club | 375 W. Central Avenue | 8,350 SF restaurant with banquet hall |
| 14. | Aldi Grocery Store | 2395 E. Imperial Highway | 21,106 SF grocery store |
| 15. | Starbucks with Drive-Thru | 2 Pointe Drive | 2,400 SF coffee shop with drive-thru |
| 16. | Lambert Road Condos | 700-800 W. Lambert Road | 24 DU condominiums |

13 Source: City of Brea, Fullerton, and Chino Hills Planning Departments.

14 The traffic impact analysis conservatively evaluated 790 units as originally planned, which would result in higher traffic volumes in the cumulative scenarios.

15 Brea 265 Specific Plan Project has been included as a related project as part of Year 2045 background traffic conditions.

16 Fifteen (15) of the proposed apartments are considered co-living units, which include five (5) 3-bedroom units and ten (10) four-bedroom units, therefore, to provide a conservative assessment, the co-living unit bedrooms have been counted as individual units for a total apartment count of 229 units.

17 The project has already built and occupied 206 DU apartments and 83 DU townhomes.

## TABLE 6-1(CONTINUED)
## LOCATION AND DESCRIPTION OF CUMULATIVE PROJECTS[18]

| No. | Description | Location/Address | Size |
|---|---|---|---|
| ***City of Brea (Continued)*** | | | |
| 17. | Brea Metro Office Condos | 330 E. Lambert Road | 33 DU condominiums |
| 18. | Father's House | 245 W. Birch Street | 299 seat religious assembly |
| 19. | Cha Cha's Expansion | 110 W. Birch Street | Existing restaurant expansion of 2,710 SF |
| 20. | Western Realco | 2929 E. Imperial Highway | 131,500 SF industrial building |
| 21. | CAMP Transformation | 910 E. Birch Street, Suite 250 | 4,100 SF Fitness Center |
| 22. | Brea Express Wash | 300 S. Brea Boulevard | 4,254 SF express car wash |
| 23. | Raising Cane's | 255 E. Imperial Highway | Demolish existing 9,588 SF office building and construction of a 4,047 SF fast food restaurant with drive-through |
| ***City of Fullerton*** | | | |
| 24. | 3105 Yorba Linda Boulevard | 3105 Yorba Linda Boulevard | 4,840 SF drive-through car wash |
| 25. | Beckman Business Center | 4300 North Harbor Boulevard | 522,250 SF Warehousing, 166,185 SF General Light Industrial, 105,880 SF Manufacturing, 42,000 SF Office, and 142,350 SF fulfillment center |
| ***City of Chino Hills*** | | | |
| 26. | Woodbridge Pacific Group (Canyon Hills/Hillcrest) | Northwest of Carbon Canyon Road and west of Canyon Hills Road | 38 DU Single Family Detached |
| 27. | Stonefield Development | Northwest of Carbon Canyon Road and east of Fairway Drive | 28 DU single-family |
| 28. | Morningfield Estates and Loving Savior of the Hills Lutheran Church and School Master Plan Addendum | South of Morningfield Drive, west of Peyton Drive, north of Chino Hills Parkway, adjacent to San Bernardino County Flood Channel | 7-Lot Subdivision with semi-custom single-family homes, plus 3 classrooms/71 student addition to the Lutheran School |
| 29. | Coptic Orthodox Church | East side of Peyton Drive, north of the Chino Creek Drainage Channel and south of the Chino Valley Community Church property | 14,695 SF multi-purpose room, 8,645 SF Sanctuary and 555 SF Bookstore |
| 30. | Buddhist Temple of Chino Hills | Northeast of Chino Hills Parkway and Rustic Drive | 23,400 SF Buddhist temple expansion |
| 31. | Hidden Oaks | East of Carbon Canyon Road at Canyon Hills Road | 53 DU Single Family |
| 32. | Paradise Ranch | East of Canyon Hills Road and south of Esquilime Drive | 51 DU single-family |

18 Source: City of Brea, Fullerton, and Chino Hills Planning Departments.

# APPENDIX B

## EXISTING TRAFFIC COUNT DATA

*APPENDIX B-I*

# EXISTING INTERSECTION TRAFFIC COUNT DATA

National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** N State College Blvd & E Lambert Rd
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01101-003
**Date:** 5/22/2019

**Total**

| NS/EW Streets: | N State College Blvd | | | | N State College Blvd | | | | E Lambert Rd | | | | E Lambert Rd | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 2 | 1.5 | 1.5 | 0 | 2 | 2 | 0 | 0 | 2 | 3.5 | 0.5 | 0 | 2 | 3 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 7:00 AM | 12 | 28 | 19 | 0 | 131 | 119 | 0 | 0 | 1 | 228 | 41 | 0 | 79 | 257 | 75 | 0 | 990 |
| 7:15 AM | 16 | 22 | 32 | 0 | 158 | 146 | 0 | 0 | 4 | 235 | 38 | 1 | 102 | 344 | 99 | 1 | 1198 |
| 7:30 AM | 17 | 24 | 22 | 0 | 158 | 144 | 0 | 0 | 0 | 258 | 59 | 0 | 92 | 369 | 114 | 1 | 1258 |
| 7:45 AM | 32 | 36 | 29 | 0 | 192 | 162 | 1 | 0 | 2 | 291 | 64 | 0 | 116 | 391 | 105 | 2 | 1423 |
| 8:00 AM | 47 | 47 | 29 | 0 | 210 | 109 | 3 | 0 | 1 | 272 | 46 | 0 | 102 | 355 | 124 | 1 | 1346 |
| 8:15 AM | 37 | 53 | 34 | 0 | 201 | 148 | 2 | 0 | 3 | 305 | 48 | 0 | 101 | 378 | 141 | 0 | 1451 |
| 8:30 AM | 28 | 47 | 34 | 0 | 221 | 134 | 2 | 0 | 7 | 294 | 29 | 0 | 87 | 323 | 139 | 0 | 1345 |
| 8:45 AM | 13 | 21 | 25 | 0 | 183 | 122 | 1 | 0 | 1 | 262 | 37 | 0 | 118 | 343 | 139 | 0 | 1265 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 202 | 278 | 224 | 0 | 1454 | 1084 | 9 | 0 | 19 | 2145 | 362 | 1 | 797 | 2760 | 936 | 5 | 10276 |
| **APPROACH %'s :** | 28.69% | 39.49% | 31.82% | 0.00% | 57.09% | 42.56% | 0.35% | 0.00% | 0.75% | 84.88% | 14.33% | 0.04% | 17.72% | 61.36% | 20.81% | 0.11% | |
| **PEAK HR :** | 07:45 AM - 08:45 AM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 144 | 183 | 126 | 0 | 824 | 553 | 8 | 0 | 13 | 1162 | 187 | 0 | 406 | 1447 | 509 | 3 | 5565 |
| **PEAK HR FACTOR :** | 0.766 | 0.863 | 0.926 | 0.000 | 0.932 | 0.853 | 0.667 | 0.000 | 0.464 | 0.952 | 0.730 | 0.000 | 0.875 | 0.925 | 0.902 | 0.375 | 0.959 |
| | 0.913 | | | | 0.970 | | | | 0.954 | | | | 0.954 | | | | |

| PM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 1.5 | 1.5 | 0 | 2 | 2 | 0 | 0 | 2 | 3.5 | 0.5 | 0 | 2 | 3 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 4:00 PM | 62 | 117 | 64 | 0 | 108 | 65 | 0 | 0 | 2 | 307 | 34 | 2 | 56 | 270 | 213 | 4 | 1304 |
| 4:15 PM | 59 | 152 | 67 | 0 | 115 | 57 | 3 | 0 | 2 | 278 | 48 | 1 | 58 | 279 | 180 | 7 | 1306 |
| 4:30 PM | 66 | 123 | 74 | 0 | 131 | 67 | 0 | 0 | 1 | 264 | 53 | 0 | 71 | 297 | 178 | 4 | 1329 |
| 4:45 PM | 75 | 162 | 44 | 0 | 110 | 84 | 3 | 0 | 6 | 196 | 52 | 0 | 68 | 298 | 170 | 0 | 1268 |
| 5:00 PM | 55 | 142 | 49 | 0 | 114 | 82 | 3 | 0 | 14 | 198 | 58 | 0 | 83 | 231 | 154 | 5 | 1188 |
| 5:15 PM | 84 | 131 | 50 | 0 | 148 | 89 | 3 | 0 | 11 | 334 | 60 | 0 | 60 | 243 | 158 | 3 | 1374 |
| 5:30 PM | 71 | 141 | 66 | 0 | 122 | 87 | 4 | 0 | 5 | 312 | 64 | 0 | 78 | 241 | 163 | 1 | 1355 |
| 5:45 PM | 78 | 133 | 72 | 0 | 135 | 94 | 4 | 0 | 6 | 242 | 51 | 0 | 66 | 245 | 178 | 1 | 1305 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 550 | 1101 | 486 | 0 | 983 | 625 | 20 | 0 | 47 | 2131 | 420 | 3 | 540 | 2104 | 1394 | 25 | 10429 |
| **APPROACH %'s :** | 25.74% | 51.52% | 22.74% | 0.00% | 60.38% | 38.39% | 1.23% | 0.00% | 1.81% | 81.93% | 16.15% | 0.12% | 13.29% | 51.78% | 34.31% | 0.62% | |
| **PEAK HR :** | 05:00 PM - 06:00 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 288 | 547 | 237 | 0 | 519 | 352 | 14 | 0 | 36 | 1086 | 233 | 0 | 287 | 960 | 653 | 10 | 5222 |
| **PEAK HR FACTOR :** | 0.857 | 0.963 | 0.823 | 0.000 | 0.877 | 0.936 | 0.875 | 0.000 | 0.643 | 0.813 | 0.910 | 0.000 | 0.864 | 0.980 | 0.917 | 0.500 | 0.950 |
| | 0.947 | | | | 0.922 | | | | 0.836 | | | | 0.974 | | | | |

Prepared by National Data & Surveying Services

# N State College Blvd & E Lambert Rd

## Peak Hour Turning Movement Count

**ID:** 19-01101-003
**City:** Brea

**Day:** Wednesday
**Date:** 05/22/2019

| PEAK HOURS | COUNT PERIODS |
|---|---|
| 07:45 AM - 08:45 AM | 07:00 AM - 09:00 AM |
| NONE | NONE |
| 05:00 PM - 06:00 PM | 04:00 PM - 06:00 PM |

### N State College Blvd — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 8 | 553 | 824 | 0 | 705 | AM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| PM | 14 | 352 | 519 | 0 | 1236 | PM |

### EASTBOUND — E Lambert Rd

| AM | NOON | PM | | |
|---|---|---|---|---|
| 1599 | 0 | 1262 | | |
| 0 | 0 | 0 | 0 | |
| 13 | 0 | 36 | 2 | |
| 1162 | 0 | 1086 | 3.5 | |
| 187 | 0 | 233 | 0.5 | |
| AM | NOON | PM | | |

### WESTBOUND — E Lambert Rd

| PM | NOON | AM | | |
|---|---|---|---|---|
| 653 | 0 | 509 | 1 | |
| 960 | 0 | 1447 | 3 | |
| 287 | 0 | 406 | 2 | |
| 10 | 0 | 3 | 0 | |
| 1852 | 0 | 2115 | | |
| PM | NOON | AM | | |

### CONTROL

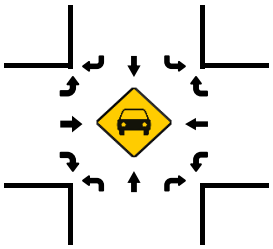
Signalized

| | | | |
|---|---|---|---|
| TEV | 5565 | 0 | 5222 |
| | AM | NOON | PM |
| PHF | 0.96 | | 0.95 |

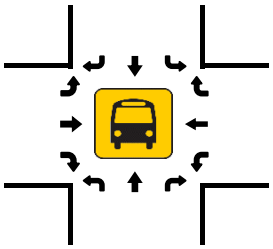
### N State College Blvd — NORTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| PM | 872 | 0 | 288 | 547 | 237 | PM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| AM | 1146 | 0 | 144 | 183 | 126 | AM |
| | | 0 | 2 | 1.5 | 1.5 | |

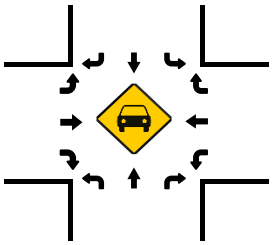
Total Vehicles (AM)



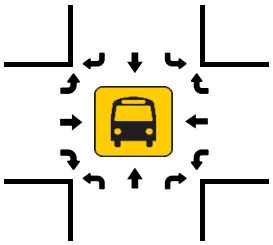
Total Vehicles (AM)



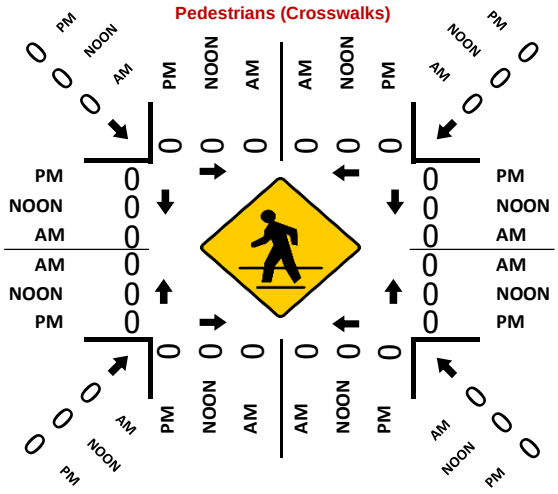
Total Vehicles (NOON)



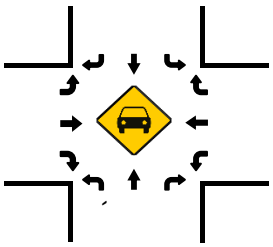
Total Vehicles (NOON)



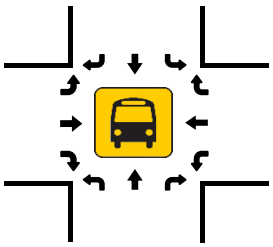
Pedestrians (Crosswalks)




Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** N State College Blvd & E Lambert Rd
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01101-003
**Date:** 5/18/2019

**Total**

| NS/EW Streets: | N State College Blvd | | | | N State College Blvd | | | | E Lambert Rd | | | | E Lambert Rd | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NOON** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 2 | 1.5 | 1.5 | 0 | 2 | 2 | 0 | 0 | 2 | 3.5 | 0.5 | 0 | 2 | 3 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 11:00 AM | 27 | 46 | 46 | 0 | 127 | 65 | 2 | 0 | 3 | 198 | 27 | 1 | 101 | 244 | 140 | 4 | 1031 |
| 11:15 AM | 22 | 57 | 69 | 0 | 125 | 65 | 0 | 0 | 6 | 202 | 45 | 0 | 113 | 275 | 139 | 0 | 1118 |
| 11:30 AM | 25 | 62 | 75 | 0 | 161 | 86 | 1 | 0 | 1 | 208 | 37 | 0 | 104 | 292 | 142 | 2 | 1196 |
| 11:45 AM | 29 | 54 | 65 | 0 | 119 | 89 | 2 | 0 | 3 | 185 | 45 | 0 | 111 | 341 | 137 | 0 | 1180 |
| 12:00 PM | 26 | 59 | 55 | 0 | 105 | 81 | 0 | 0 | 3 | 217 | 64 | 0 | 138 | 352 | 154 | 1 | 1255 |
| 12:15 PM | 31 | 60 | 90 | 0 | 122 | 87 | 2 | 0 | 4 | 212 | 54 | 0 | 144 | 303 | 148 | 1 | 1258 |
| 12:30 PM | 28 | 60 | 76 | 0 | 106 | 73 | 2 | 0 | 6 | 275 | 73 | 0 | 150 | 335 | 171 | 2 | 1357 |
| 12:45 PM | 37 | 54 | 76 | 0 | 139 | 91 | 1 | 0 | 4 | 220 | 56 | 0 | 175 | 280 | 183 | 2 | 1318 |
| 1:00 PM | 29 | 51 | 66 | 0 | 142 | 76 | 1 | 0 | 4 | 228 | 53 | 0 | 115 | 257 | 163 | 0 | 1185 |
| 1:15 PM | 33 | 69 | 84 | 0 | 108 | 73 | 2 | 0 | 2 | 265 | 49 | 0 | 101 | 248 | 148 | 3 | 1185 |
| 1:30 PM | 23 | 58 | 95 | 0 | 116 | 75 | 3 | 0 | 4 | 236 | 54 | 1 | 104 | 274 | 157 | 1 | 1201 |
| 1:45 PM | 22 | 76 | 84 | 0 | 140 | 84 | 2 | 0 | 6 | 238 | 51 | 0 | 122 | 293 | 173 | 2 | 1293 |
| 2:00 PM | 32 | 62 | 88 | 0 | 128 | 60 | 1 | 0 | 2 | 246 | 34 | 0 | 107 | 296 | 164 | 1 | 1221 |
| 2:15 PM | 38 | 62 | 84 | 0 | 127 | 61 | 6 | 0 | 3 | 180 | 41 | 0 | 117 | 301 | 161 | 4 | 1185 |
| 2:30 PM | 35 | 64 | 100 | 0 | 131 | 62 | 3 | 0 | 2 | 236 | 42 | 0 | 107 | 333 | 158 | 1 | 1274 |
| 2:45 PM | 29 | 59 | 91 | 0 | 124 | 84 | 0 | 0 | 6 | 250 | 52 | 0 | 131 | 283 | 176 | 0 | 1285 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 466 | 953 | 1244 | 0 | 2020 | 1212 | 28 | 0 | 59 | 3596 | 777 | 2 | 1940 | 4707 | 2514 | 24 | 19542 |
| **APPROACH %'s :** | 17.50% | 35.79% | 46.71% | 0.00% | 61.96% | 37.18% | 0.86% | 0.00% | 1.33% | 81.10% | 17.52% | 0.05% | 21.12% | 51.25% | 27.37% | 0.26% | |
| **PEAK HR :** | 12:00 PM - 01:00 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 122 | 233 | 297 | 0 | 472 | 332 | 5 | 0 | 17 | 924 | 247 | 0 | 607 | 1270 | 656 | 6 | 5188 |
| **PEAK HR FACTOR :** | 0.824 | 0.971 | 0.825 | 0.000 | 0.849 | 0.912 | 0.625 | 0.000 | 0.708 | 0.840 | 0.846 | 0.000 | 0.867 | 0.902 | 0.896 | 0.750 | 0.956 |
| | 0.901 | | | | 0.876 | | | | 0.839 | | | | 0.965 | | | | |

Prepared by National Data & Surveying Services

# N State College Blvd & E Lambert Rd

## Peak Hour Turning Movement Count

**ID:** 19-01101-003
**City:** Brea

**Day:** Saturday
**Date:** 05/18/2019

| PEAK HOURS | |
|---|---|
| AM | NONE |
| NOON | 12:00 PM - 01:00 PM |
| PM | NONE |

| COUNT PERIODS | |
|---|---|
| AM | NONE |
| NOON | 11:00 AM - 03:00 PM |
| PM | NONE |

### N State College Blvd — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 0 | 0 | 0 | 0 | 0 | AM |
| NOON | 5 | 332 | 472 | 0 | 906 | NOON |
| PM | 0 | 0 | 0 | 0 | 0 | PM |
| | 0 | 2 | 2 | 0 | | |

### E Lambert Rd — EASTBOUND

| AM | NOON | PM | | |
|---|---|---|---|---|
| 0 | 1397 | 0 | | |
| 0 | 0 | 0 | 0 | |
| 0 | 17 | 0 | 2 | |
| 0 | 924 | 0 | 3.5 | |
| 0 | 247 | 0 | 0.5 | |
| AM | NOON | PM | | |

### CONTROL

Signalized

| | AM | NOON | PM |
|---|---|---|---|
| TEV | 0 | 5188 | 0 |
| PHF | | 0.96 | |

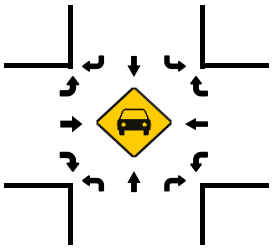
### WESTBOUND — E Lambert Rd

| PM | NOON | AM | |
|---|---|---|---|
| 0 | 656 | 0 | 1 |
| 0 | 1270 | 0 | 3 |
| 0 | 607 | 0 | 2 |
| 0 | 6 | 0 | 0 |
| 0 | 1699 | 0 | |
| PM | NOON | AM | |

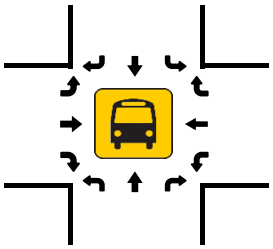
| | | | | | | |
|---|---|---|---|---|---|---|
| | 0 | 2 | 1.5 | 1.5 | | |
| PM | 0 | 0 | 0 | 0 | 0 | PM |
| NOON | 1186 | 0 | 122 | 233 | 297 | NOON |
| AM | 0 | 0 | 0 | 0 | 0 | AM |

### N State College Blvd — NORTHBOUND

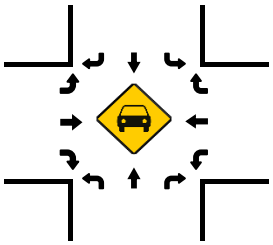
Total Vehicles (AM)



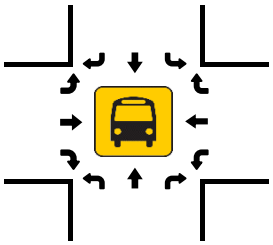
Total Vehicles (AM)



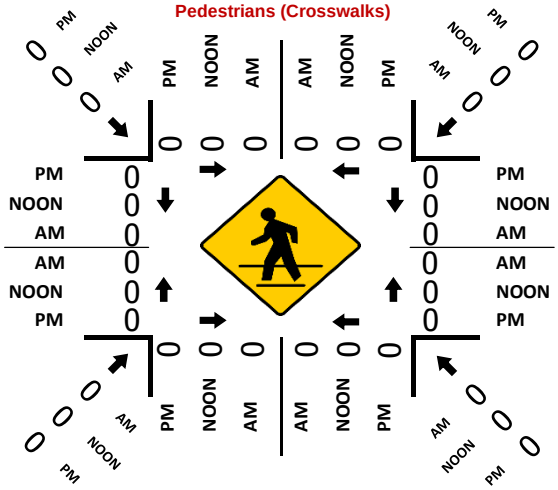
Total Vehicles (NOON)



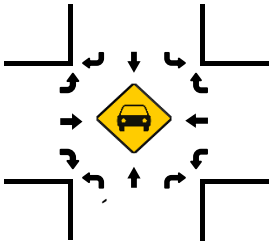
Total Vehicles (NOON)



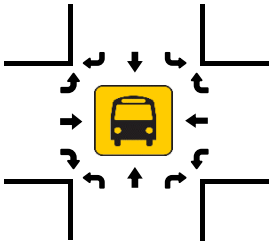
Pedestrians (Crosswalks)




Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** SR-57 SB Ramps & E Lambert Rd
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01101-004
**Date:** 5/22/2019

**Total**

| NS/EW Streets: | SR-57 SB Ramps | | | | SR-57 SB Ramps | | | | E Lambert Rd | | | | E Lambert Rd | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 0 | 0 | 0 | 0 | 1.5 | 0 | 1.5 | 0 | 0 | 2.5 | 1.5 | 0 | 2 | 3 | 0 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 7:00 AM | 0 | 0 | 0 | 0 | 230 | 1 | 125 | 0 | 0 | 241 | 132 | 0 | 33 | 308 | 0 | 0 | 1070 |
| 7:15 AM | 0 | 0 | 0 | 0 | 267 | 0 | 149 | 0 | 0 | 312 | 128 | 0 | 36 | 385 | 0 | 0 | 1277 |
| 7:30 AM | 0 | 0 | 0 | 0 | 270 | 0 | 150 | 0 | 0 | 296 | 129 | 0 | 58 | 413 | 0 | 0 | 1316 |
| 7:45 AM | 0 | 0 | 0 | 0 | 288 | 0 | 136 | 0 | 0 | 375 | 126 | 0 | 38 | 485 | 0 | 1 | 1449 |
| 8:00 AM | 0 | 0 | 0 | 0 | 223 | 0 | 116 | 0 | 0 | 404 | 120 | 0 | 53 | 476 | 0 | 1 | 1393 |
| 8:15 AM | 0 | 0 | 0 | 0 | 257 | 0 | 121 | 0 | 0 | 397 | 132 | 0 | 59 | 522 | 0 | 0 | 1488 |
| 8:30 AM | 0 | 0 | 0 | 0 | 209 | 1 | 115 | 0 | 0 | 403 | 160 | 0 | 54 | 446 | 0 | 1 | 1389 |
| 8:45 AM | 0 | 0 | 0 | 0 | 235 | 0 | 149 | 0 | 0 | 345 | 136 | 0 | 64 | 458 | 0 | 1 | 1388 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 0 | 0 | 0 | 0 | 1979 | 2 | 1061 | 0 | 0 | 2773 | 1063 | 0 | 395 | 3493 | 0 | 4 | 10770 |
| **APPROACH %'s :** | | | | | 65.06% | 0.07% | 34.88% | 0.00% | 0.00% | 72.29% | 27.71% | 0.00% | 10.15% | 89.75% | 0.00% | 0.10% | |
| **PEAK HR :** | 07:45 AM - 08:45 AM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 0 | 0 | 0 | 0 | 977 | 1 | 488 | 0 | 0 | 1579 | 538 | 0 | 204 | 1929 | 0 | 3 | 5719 |
| **PEAK HR FACTOR :** | 0.000 | 0.000 | 0.000 | 0.000 | 0.848 | 0.250 | 0.897 | 0.000 | 0.000 | 0.977 | 0.841 | 0.000 | 0.864 | 0.924 | 0.000 | 0.750 | 0.961 |
| | | | | | 0.864 | | | | 0.940 | | | | 0.919 | | | | |

| PM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | 1.5 | 0 | 1.5 | 0 | 0 | 2.5 | 1.5 | 0 | 2 | 3 | 0 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 4:00 PM | 0 | 0 | 0 | 0 | 116 | 1 | 143 | 0 | 0 | 292 | 209 | 0 | 52 | 391 | 0 | 1 | 1205 |
| 4:15 PM | 0 | 0 | 0 | 0 | 114 | 1 | 172 | 0 | 0 | 301 | 151 | 0 | 45 | 362 | 0 | 2 | 1148 |
| 4:30 PM | 0 | 0 | 0 | 0 | 92 | 1 | 183 | 0 | 0 | 256 | 195 | 0 | 63 | 372 | 0 | 0 | 1162 |
| 4:45 PM | 0 | 0 | 0 | 0 | 100 | 1 | 164 | 0 | 0 | 209 | 155 | 0 | 52 | 406 | 0 | 0 | 1087 |
| 5:00 PM | 0 | 0 | 0 | 0 | 100 | 6 | 165 | 0 | 0 | 172 | 185 | 0 | 85 | 292 | 0 | 0 | 1005 |
| 5:15 PM | 0 | 0 | 0 | 0 | 150 | 2 | 149 | 0 | 0 | 359 | 200 | 0 | 70 | 322 | 0 | 1 | 1253 |
| 5:30 PM | 0 | 0 | 0 | 0 | 144 | 1 | 168 | 0 | 0 | 322 | 172 | 0 | 55 | 325 | 0 | 0 | 1187 |
| 5:45 PM | 0 | 0 | 0 | 0 | 98 | 0 | 151 | 0 | 0 | 314 | 148 | 0 | 60 | 358 | 0 | 0 | 1129 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 0 | 0 | 0 | 0 | 914 | 13 | 1295 | 0 | 0 | 2225 | 1415 | 0 | 482 | 2828 | 0 | 4 | 9176 |
| **APPROACH %'s :** | | | | | 41.13% | 0.59% | 58.28% | 0.00% | 0.00% | 61.13% | 38.87% | 0.00% | 14.54% | 85.33% | 0.00% | 0.12% | |
| **PEAK HR :** | 04:00 PM - 05:00 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 0 | 0 | 0 | 0 | 422 | 4 | 662 | 0 | 0 | 1058 | 710 | 0 | 212 | 1531 | 0 | 3 | 4602 |
| **PEAK HR FACTOR :** | 0.000 | 0.000 | 0.000 | 0.000 | 0.909 | 1.000 | 0.904 | 0.000 | 0.000 | 0.879 | 0.849 | 0.000 | 0.841 | 0.943 | 0.000 | 0.375 | 0.955 |
| | | | | | 0.948 | | | | 0.882 | | | | 0.953 | | | | |

Prepared by National Data & Surveying Services

# SR-57 SB Ramps & E Lambert Rd

## Peak Hour Turning Movement Count

**ID:** 19-01101-004
**City:** Brea

**Day:** Wednesday
**Date:** 05/22/2019

**PEAK HOURS**

AM: 07:45 AM - 08:45 AM
NOON: NONE
PM: 04:00 PM - 05:00 PM

**COUNT PERIODS**

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

### SR-57 SB Ramps — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 488 | 1 | 977 | 0 | 0 | AM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| PM | 662 | 4 | 422 | 0 | 0 | PM |
| | 1.5 | 0 | 1.5 | 0 | | |

### EASTBOUND (E Lambert Rd)

| AM | NOON | PM | |
|---|---|---|---|
| 2417 | 0 | 2193 | |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 1579 | 0 | 1058 | 2.5 |
| 538 | 0 | 710 | 1.5 |

### WESTBOUND (E Lambert Rd)

| | PM | NOON | AM |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| 3 | 1531 | 0 | 1929 |
| 2 | 212 | 0 | 204 |
| 0 | 3 | 0 | 3 |
| | 1483 | 0 | 2559 |

### CONTROL

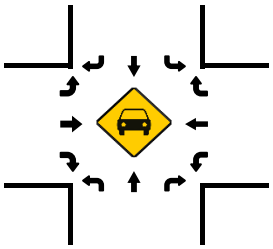
Signalized

| | AM | NOON | PM |
|---|---|---|---|
| TEV | 5719 | 0 | 4602 |
| PHF | 0.96 | | 0.95 |

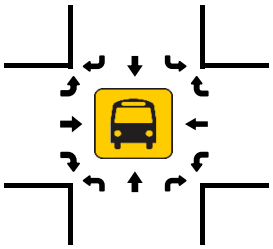
### NORTHBOUND — SR-57 SB Ramps

| | | | | | | |
|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | | |
| PM | 926 | 0 | 0 | 0 | 0 | PM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| AM | 743 | 0 | 0 | 0 | 0 | AM |

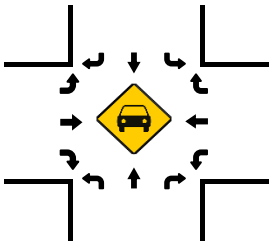
Total Vehicles (AM)



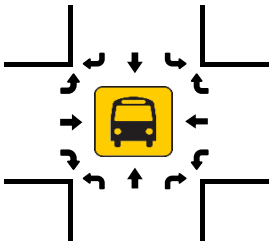
Total Vehicles (AM)



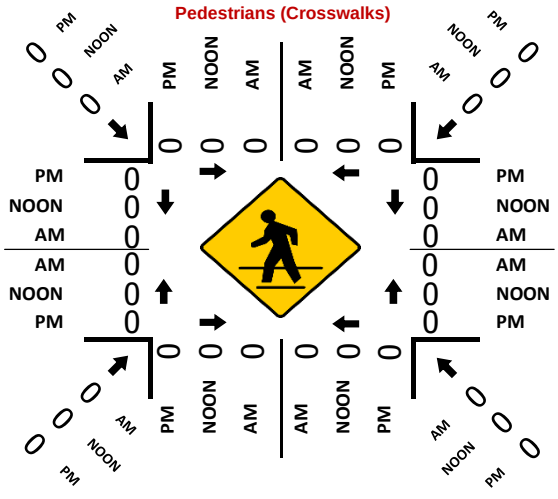
Total Vehicles (NOON)



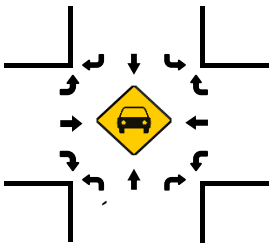
Total Vehicles (NOON)



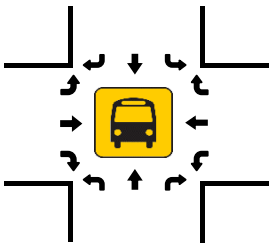
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** SR-57 SB Ramps & E Lambert Rd
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01101-004
**Date:** 5/18/2019

**Total**

| NS/EW Streets: | SR-57 SB Ramps | | | | SR-57 SB Ramps | | | | E Lambert Rd | | | | E Lambert Rd | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NOON** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 0 | 0 | 0 | 0 | 1.5 | 0 | 1.5 | 0 | 0 | 2.5 | 1.5 | 0 | 2 | 3 | 0 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 11:00 AM | 0 | 0 | 0 | 0 | 123 | 0 | 179 | 0 | 0 | 252 | 136 | 0 | 56 | 310 | 0 | 0 | 1056 |
| 11:15 AM | 0 | 0 | 0 | 0 | 102 | 0 | 191 | 0 | 0 | 248 | 155 | 0 | 82 | 325 | 0 | 1 | 1104 |
| 11:30 AM | 0 | 0 | 0 | 0 | 103 | 0 | 208 | 0 | 0 | 253 | 176 | 0 | 61 | 350 | 0 | 2 | 1153 |
| 11:45 AM | 0 | 0 | 0 | 0 | 105 | 0 | 213 | 0 | 0 | 266 | 125 | 0 | 68 | 364 | 0 | 0 | 1141 |
| 12:00 PM | 0 | 0 | 0 | 0 | 166 | 1 | 247 | 0 | 0 | 254 | 118 | 0 | 44 | 411 | 0 | 0 | 1241 |
| 12:15 PM | 0 | 0 | 0 | 0 | 210 | 0 | 225 | 0 | 0 | 284 | 128 | 0 | 34 | 358 | 0 | 0 | 1239 |
| 12:30 PM | 0 | 0 | 0 | 0 | 210 | 1 | 245 | 0 | 0 | 314 | 126 | 0 | 41 | 400 | 0 | 1 | 1338 |
| 12:45 PM | 0 | 0 | 0 | 0 | 170 | 0 | 250 | 0 | 0 | 332 | 123 | 0 | 34 | 404 | 0 | 3 | 1316 |
| 1:00 PM | 0 | 0 | 0 | 0 | 160 | 0 | 194 | 0 | 0 | 318 | 129 | 0 | 58 | 318 | 0 | 0 | 1177 |
| 1:15 PM | 0 | 0 | 0 | 0 | 146 | 1 | 184 | 0 | 0 | 298 | 147 | 0 | 38 | 297 | 0 | 0 | 1111 |
| 1:30 PM | 0 | 0 | 0 | 0 | 139 | 0 | 219 | 0 | 0 | 335 | 124 | 0 | 55 | 333 | 0 | 0 | 1205 |
| 1:45 PM | 0 | 0 | 0 | 0 | 154 | 0 | 208 | 0 | 0 | 330 | 122 | 0 | 51 | 371 | 0 | 0 | 1236 |
| 2:00 PM | 0 | 0 | 0 | 0 | 140 | 1 | 215 | 0 | 0 | 302 | 141 | 0 | 61 | 320 | 0 | 1 | 1181 |
| 2:15 PM | 0 | 0 | 0 | 0 | 113 | 1 | 222 | 0 | 0 | 272 | 151 | 0 | 72 | 378 | 0 | 0 | 1209 |
| 2:30 PM | 0 | 0 | 0 | 0 | 128 | 0 | 198 | 0 | 0 | 289 | 156 | 0 | 68 | 374 | 0 | 0 | 1213 |
| 2:45 PM | 0 | 0 | 0 | 0 | 120 | 0 | 210 | 0 | 0 | 332 | 141 | 0 | 60 | 367 | 0 | 0 | 1230 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 0 | 0 | 0 | 0 | 2289 | 5 | 3408 | 0 | 0 | 4679 | 2198 | 0 | 883 | 5680 | 0 | 8 | 19150 |
| **APPROACH %'s :** | | | | | 40.14% | 0.09% | 59.77% | 0.00% | 0.00% | 68.04% | 31.96% | 0.00% | 13.44% | 86.44% | 0.00% | 0.12% | |
| **PEAK HR :** | 12:00 PM - 01:00 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 0 | 0 | 0 | 0 | 756 | 2 | 967 | 0 | 0 | 1184 | 495 | 0 | 153 | 1573 | 0 | 4 | 5134 |
| **PEAK HR FACTOR :** | 0.000 | 0.000 | 0.000 | 0.000 | 0.900 | 0.500 | 0.967 | 0.000 | 0.000 | 0.892 | 0.967 | 0.000 | 0.869 | 0.957 | 0.000 | 0.333 | 0.959 |
| | | | | | | | 0.946 | | | | 0.923 | | | | 0.951 | | |

Prepared by National Data & Surveying Services

# SR-57 SB Ramps & E Lambert Rd

## Peak Hour Turning Movement Count

**ID:** 19-01101-004
**City:** Brea

**Day:** Saturday
**Date:** 05/18/2019

| PEAK HOURS | COUNT PERIODS |
|---|---|
| NONE | NONE |
| 12:00 PM - 01:00 PM | 11:00 AM - 03:00 PM |
| NONE | NONE |

**CONTROL:** Signalized

| | AM | NOON | PM |
|---|---|---|---|
| TEV | 0 | 5134 | 0 |
| PHF | | 0.96 | |

### SR-57 SB Ramps — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 0 | 0 | 0 | 0 | 0 | AM |
| NOON | 967 | 2 | 756 | 0 | 0 | NOON |
| PM | 0 | 0 | 0 | 0 | 0 | PM |
| | 1.5 | 0 | 1.5 | 0 | | |

### EASTBOUND — E Lambert Rd

| AM | NOON | PM | |
|---|---|---|---|
| 0 | 2540 | 0 | |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 1184 | 0 | 2.5 |
| 0 | 495 | 0 | 1.5 |
| AM | NOON | PM | |

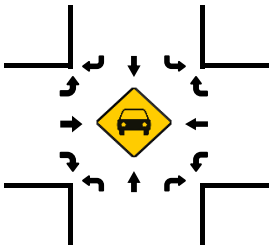
### WESTBOUND — E Lambert Rd

| PM | NOON | AM | |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| 0 | 1573 | 0 | 3 |
| 0 | 153 | 0 | 2 |
| 0 | 4 | 0 | 0 |
| | 1944 | 0 | |
| PM | NOON | AM | |

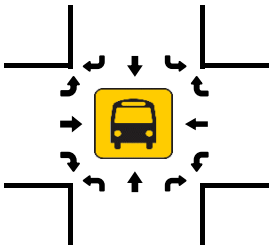
| | | | | | | |
|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | | |
| PM | 0 | 0 | 0 | 0 | 0 | PM |
| NOON | 650 | 0 | 0 | 0 | 0 | NOON |
| AM | 0 | 0 | 0 | 0 | 0 | AM |

### NORTHBOUND — SR-57 SB Ramps

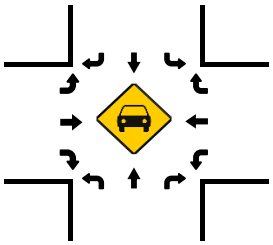
Total Vehicles (AM)



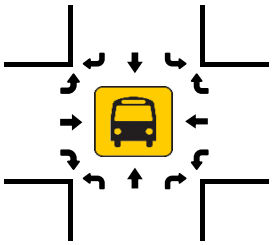
Total Vehicles (AM)



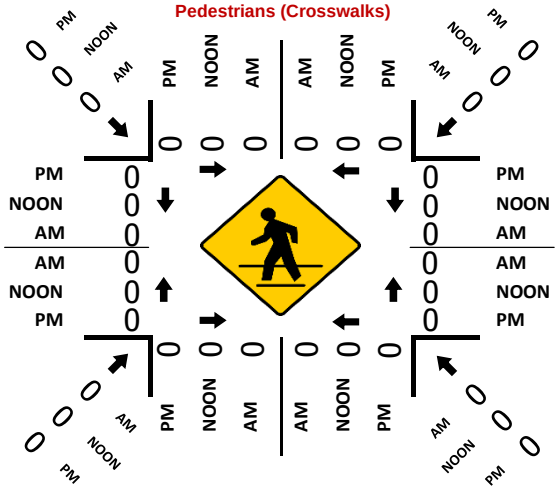
Total Vehicles (NOON)



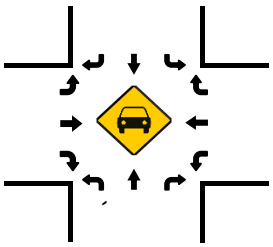
Total Vehicles (NOON)



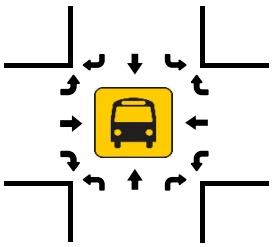
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** SR-57 NB Ramps & E Lambert Rd
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01101-005
**Date:** 5/22/2019

**Total**

| NS/EW Streets: | SR-57 NB Ramps | | | | SR-57 NB Ramps | | | | E Lambert Rd | | | | E Lambert Rd | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 2.5 | 1.5 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 7:00 AM | 189 | 0 | 88 | 0 | 0 | 0 | 0 | 0 | 72 | 409 | 0 | 0 | 0 | 143 | 124 | 0 | 1025 |
| 7:15 AM | 265 | 0 | 100 | 0 | 0 | 0 | 0 | 0 | 75 | 497 | 0 | 1 | 0 | 169 | 118 | 0 | 1225 |
| 7:30 AM | 243 | 0 | 93 | 0 | 0 | 0 | 0 | 0 | 60 | 520 | 0 | 1 | 0 | 220 | 128 | 0 | 1265 |
| 7:45 AM | 276 | 0 | 124 | 0 | 0 | 0 | 0 | 0 | 58 | 596 | 0 | 2 | 0 | 253 | 111 | 0 | 1420 |
| 8:00 AM | 231 | 0 | 115 | 0 | 0 | 0 | 0 | 0 | 53 | 588 | 0 | 1 | 0 | 305 | 108 | 0 | 1401 |
| 8:15 AM | 236 | 0 | 106 | 0 | 0 | 0 | 0 | 0 | 86 | 557 | 0 | 0 | 0 | 337 | 124 | 0 | 1446 |
| 8:30 AM | 227 | 1 | 114 | 0 | 0 | 0 | 0 | 0 | 62 | 544 | 0 | 0 | 0 | 282 | 109 | 0 | 1339 |
| 8:45 AM | 239 | 0 | 124 | 0 | 0 | 0 | 0 | 0 | 66 | 528 | 0 | 0 | 0 | 287 | 113 | 0 | 1357 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 1906 | 1 | 864 | 0 | 0 | 0 | 0 | 0 | 532 | 4239 | 0 | 5 | 0 | 1996 | 935 | 0 | 10478 |
| **APPROACH %'s :** | 68.78% | 0.04% | 31.18% | 0.00% | | | | | 11.14% | 88.76% | 0.00% | 0.10% | 0.00% | 68.10% | 31.90% | 0.00% | |
| **PEAK HR :** | 07:45 AM - 08:45 AM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 970 | 1 | 459 | 0 | 0 | 0 | 0 | 0 | 259 | 2285 | 0 | 3 | 0 | 1177 | 452 | 0 | 5606 |
| **PEAK HR FACTOR :** | 0.879 | 0.250 | 0.925 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.753 | 0.958 | 0.000 | 0.375 | 0.000 | 0.873 | 0.911 | 0.000 | 0.969 |
| | 0.894 | | | | | | | | 0.971 | | | | 0.883 | | | | |

| PM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 2.5 | 1.5 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 4:00 PM | 223 | 0 | 95 | 0 | 0 | 0 | 0 | 0 | 57 | 329 | 0 | 1 | 0 | 242 | 115 | 0 | 1062 |
| 4:15 PM | 202 | 0 | 72 | 0 | 0 | 0 | 0 | 0 | 81 | 349 | 0 | 1 | 0 | 233 | 122 | 0 | 1060 |
| 4:30 PM | 172 | 1 | 72 | 0 | 0 | 0 | 0 | 0 | 77 | 265 | 0 | 0 | 0 | 242 | 127 | 0 | 956 |
| 4:45 PM | 176 | 1 | 69 | 0 | 0 | 0 | 0 | 0 | 57 | 232 | 0 | 0 | 0 | 253 | 121 | 0 | 909 |
| 5:00 PM | 127 | 1 | 46 | 0 | 0 | 0 | 0 | 0 | 54 | 231 | 0 | 1 | 0 | 264 | 119 | 0 | 843 |
| 5:15 PM | 141 | 0 | 63 | 0 | 0 | 0 | 0 | 0 | 85 | 411 | 0 | 0 | 0 | 247 | 125 | 0 | 1072 |
| 5:30 PM | 176 | 1 | 78 | 0 | 0 | 0 | 0 | 0 | 95 | 363 | 0 | 0 | 0 | 222 | 112 | 0 | 1047 |
| 5:45 PM | 162 | 1 | 61 | 0 | 0 | 0 | 0 | 0 | 101 | 333 | 0 | 0 | 0 | 240 | 131 | 0 | 1029 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 1379 | 5 | 556 | 0 | 0 | 0 | 0 | 0 | 607 | 2513 | 0 | 3 | 0 | 1943 | 972 | 0 | 7978 |
| **APPROACH %'s :** | 71.08% | 0.26% | 28.66% | 0.00% | | | | | 19.44% | 80.47% | 0.00% | 0.10% | 0.00% | 66.66% | 33.34% | 0.00% | |
| **PEAK HR :** | 05:00 PM - 06:00 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 606 | 3 | 248 | 0 | 0 | 0 | 0 | 0 | 335 | 1338 | 0 | 1 | 0 | 973 | 487 | 0 | 3991 |
| **PEAK HR FACTOR :** | 0.861 | 0.750 | 0.795 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.829 | 0.814 | 0.000 | 0.250 | 0.000 | 0.921 | 0.929 | 0.000 | 0.931 |
| | 0.840 | | | | | | | | 0.844 | | | | 0.953 | | | | |

Prepared by National Data & Surveying Services

# SR-57 NB Ramps & E Lambert Rd

## Peak Hour Turning Movement Count

**ID:** 19-01101-005
**City:** Brea

**Day:** Wednesday
**Date:** 05/22/2019

| PEAK HOURS | COUNT PERIODS |
|---|---|
| 07:45 AM - 08:45 AM | 07:00 AM - 09:00 AM |
| NONE | NONE |
| 05:00 PM - 06:00 PM | 04:00 PM - 06:00 PM |

### SR-57 NB Ramps — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 0 | 0 | 0 | 0 | 712 | AM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| PM | 0 | 0 | 0 | 0 | 825 | PM |

### E Lambert Rd — EASTBOUND

| AM | NOON | PM | | |
|---|---|---|---|---|
| 2150 | 0 | 1580 | ⇦ | |
| 3 | 0 | 1 | ↶ | 0 |
| 259 | 0 | 335 | ↱ | 2 |
| 2285 | 0 | 1338 | → | 3 |
| 0 | 0 | 0 | ↷ | 0 |
| AM | NOON | PM | | |

### WESTBOUND — E Lambert Rd

| PM | NOON | AM | | |
|---|---|---|---|---|
| 487 | 0 | 452 | ↰ | 1.5 |
| 973 | 0 | 1177 | ← | 2.5 |
| 0 | 0 | 0 | ↰ | 0 |
| 0 | 0 | 0 | ↶ | 0 |
| 1586 | 0 | 2744 | ⇨ | |
| PM | NOON | AM | | |

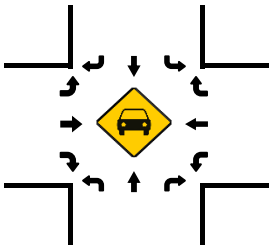
**CONTROL:** Signalized

| | | | |
|---|---|---|---|
| TEV | 5606 | 0 | 3991 |
| | AM | NOON | PM |
| PHF | 0.97 | | 0.93 |

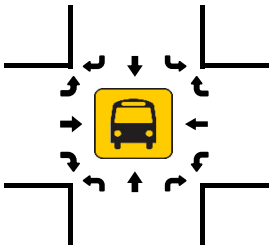
### SR-57 NB Ramps — NORTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| PM | 0 | 0 | 606 | 3 | 248 | PM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| AM | 0 | 0 | 970 | 1 | 459 | AM |
| | 0 | 0 | 0 | 2 | 0 | 1 |

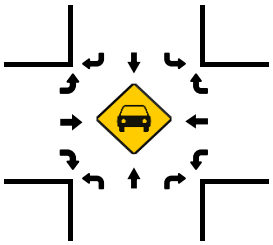
Total Vehicles (AM)



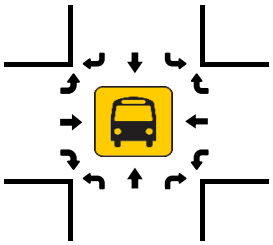
Total Vehicles (AM)



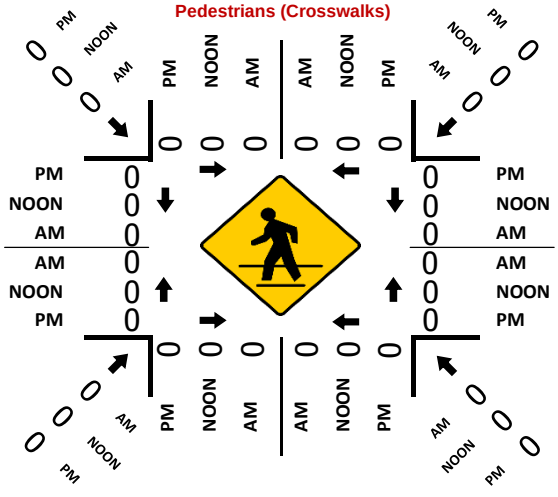
Total Vehicles (NOON)



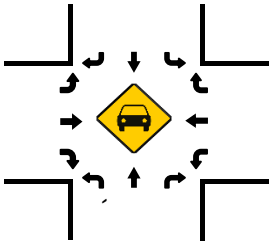
Total Vehicles (NOON)



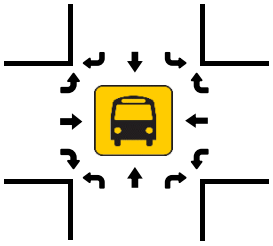
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** SR-57 NB Ramps & E Lambert Rd
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01101-005
**Date:** 5/18/2019

**Total**

| NS/EW Streets: | SR-57 NB Ramps | | | | SR-57 NB Ramps | | | | E Lambert Rd | | | | E Lambert Rd | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NOON** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 2.5 | 1.5 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 11:00 AM | 170 | 0 | 64 | 0 | 0 | 0 | 0 | 0 | 103 | 267 | 0 | 1 | 0 | 212 | 88 | 0 | 905 |
| 11:15 AM | 210 | 2 | 86 | 0 | 0 | 0 | 0 | 0 | 109 | 246 | 0 | 1 | 0 | 171 | 95 | 0 | 920 |
| 11:30 AM | 211 | 1 | 99 | 0 | 0 | 0 | 0 | 0 | 105 | 243 | 0 | 0 | 0 | 219 | 86 | 0 | 964 |
| 11:45 AM | 209 | 0 | 93 | 0 | 0 | 0 | 0 | 0 | 119 | 257 | 0 | 2 | 0 | 231 | 91 | 0 | 1002 |
| 12:00 PM | 248 | 0 | 97 | 0 | 0 | 0 | 0 | 0 | 99 | 324 | 0 | 0 | 0 | 196 | 83 | 0 | 1047 |
| 12:15 PM | 232 | 1 | 107 | 0 | 0 | 0 | 0 | 0 | 107 | 377 | 0 | 0 | 0 | 170 | 102 | 0 | 1096 |
| 12:30 PM | 252 | 0 | 99 | 0 | 0 | 0 | 0 | 0 | 145 | 390 | 0 | 1 | 0 | 194 | 106 | 0 | 1187 |
| 12:45 PM | 250 | 0 | 98 | 0 | 0 | 0 | 0 | 0 | 157 | 345 | 0 | 1 | 0 | 188 | 89 | 0 | 1128 |
| 1:00 PM | 191 | 0 | 82 | 0 | 0 | 0 | 0 | 0 | 150 | 332 | 0 | 0 | 0 | 178 | 76 | 0 | 1009 |
| 1:15 PM | 181 | 0 | 105 | 0 | 0 | 0 | 0 | 0 | 153 | 302 | 0 | 0 | 0 | 167 | 91 | 0 | 999 |
| 1:30 PM | 191 | 0 | 70 | 0 | 0 | 0 | 0 | 0 | 147 | 316 | 0 | 1 | 0 | 186 | 114 | 0 | 1025 |
| 1:45 PM | 214 | 1 | 82 | 0 | 0 | 0 | 0 | 0 | 166 | 316 | 0 | 2 | 0 | 204 | 103 | 0 | 1088 |
| 2:00 PM | 200 | 0 | 100 | 0 | 0 | 0 | 0 | 0 | 131 | 321 | 0 | 1 | 0 | 193 | 106 | 0 | 1052 |
| 2:15 PM | 211 | 0 | 104 | 0 | 0 | 0 | 0 | 0 | 103 | 267 | 0 | 0 | 0 | 228 | 106 | 0 | 1019 |
| 2:30 PM | 211 | 0 | 86 | 0 | 0 | 0 | 0 | 0 | 131 | 279 | 0 | 0 | 0 | 241 | 87 | 0 | 1035 |
| 2:45 PM | 192 | 1 | 103 | 0 | 0 | 0 | 0 | 0 | 152 | 307 | 0 | 1 | 0 | 216 | 97 | 0 | 1069 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 3373 | 6 | 1475 | 0 | 0 | 0 | 0 | 0 | 2077 | 4889 | 0 | 11 | 0 | 3194 | 1520 | 0 | 16545 |
| **APPROACH %'s :** | 69.49% | 0.12% | 30.39% | 0.00% | | | | | 29.77% | 70.07% | 0.00% | 0.16% | 0.00% | 67.76% | 32.24% | 0.00% | |
| **PEAK HR :** | 12:00 PM - 01:00 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 982 | 1 | 401 | 0 | 0 | 0 | 0 | 0 | 508 | 1436 | 0 | 2 | 0 | 748 | 380 | 0 | 4458 |
| **PEAK HR FACTOR :** | 0.974 | 0.250 | 0.937 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.809 | 0.921 | 0.000 | 0.500 | 0.000 | 0.954 | 0.896 | 0.000 | 0.939 |
| | | 0.986 | | | | | | | | 0.908 | | | | 0.940 | | | |

Prepared by National Data & Surveying Services

# SR-57 NB Ramps & E Lambert Rd

## Peak Hour Turning Movement Count

**ID:** 19-01101-005
**City:** Brea

**Day:** Saturday
**Date:** 05/18/2019

| PEAK HOURS | COUNT PERIODS |
|---|---|
| NONE | NONE |
| 12:00 PM - 01:00 PM | 11:00 AM - 03:00 PM |
| NONE | NONE |

**CONTROL:** Signalized

| | AM | NOON | PM |
|---|---|---|---|
| TEV | 0 | 4458 | 0 |
| PHF | | 0.94 | |

### SR-57 NB Ramps — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 0 | 0 | 0 | 0 | 0 | AM |
| NOON | 0 | 0 | 0 | 0 | 889 | NOON |
| PM | 0 | 0 | 0 | 0 | 0 | PM |

### EASTBOUND — E Lambert Rd

| AM | NOON | PM | |
|---|---|---|---|
| 0 | 1732 | 0 | ⇦ |
| 0 | 2 | 0 | ↶ 0 |
| 0 | 508 | 0 | ↱ 2 |
| 0 | 1436 | 0 | → 3 |
| 0 | 0 | 0 | ↷ 0 |

### WESTBOUND — E Lambert Rd

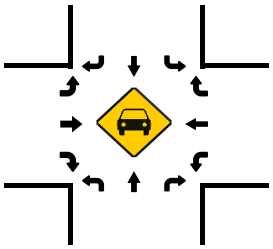
| PM | NOON | AM | |
|---|---|---|---|
| 0 | 380 | 0 | 1.5 ↰ |
| 0 | 748 | 0 | 2.5 ← |
| 0 | 0 | 0 | 0 ↶ |
| 0 | 0 | 0 | 0 ↶ |
| 0 | 1837 | 0 | ⇨ |

### NORTHBOUND — SR-57 NB Ramps

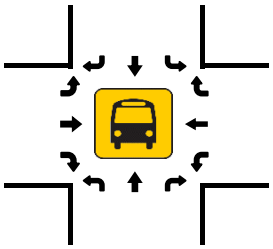
| | | | | | | |
|---|---|---|---|---|---|---|
| PM | 0 | 0 | 0 | 0 | 0 | PM |
| NOON | 0 | 0 | 982 | 1 | 401 | NOON |
| AM | 0 | 0 | 0 | 0 | 0 | AM |

0 0 0 0 — 0 2 0 1

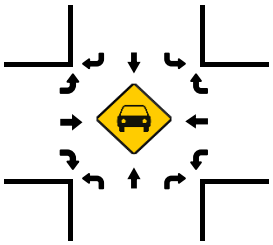
Total Vehicles (AM)



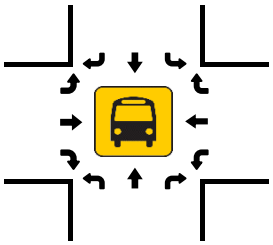
Total Vehicles (AM)



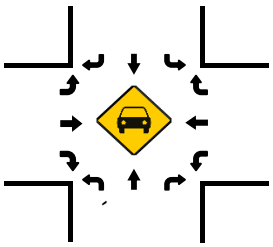
Total Vehicles (NOON)



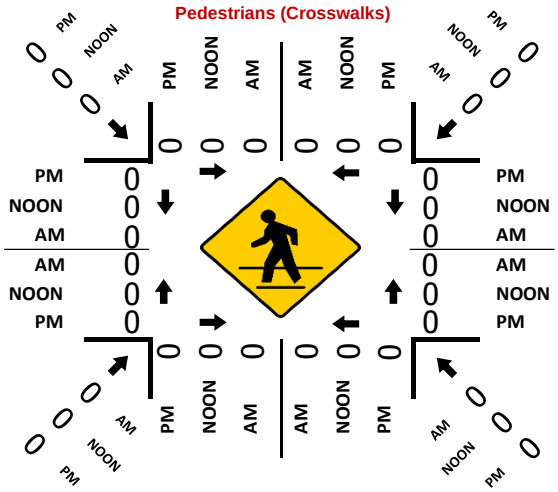
Total Vehicles (NOON)



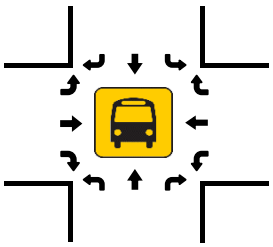
Total Vehicles (PM)



Pedestrians (Crosswalks)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** Market Pl/S Randolph Ave & E Birch St
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01101-008
**Date:** 5/22/2019

**Total**

| NS/EW Streets: | Market Pl/S Randolph Ave | | | | Market Pl/S Randolph Ave | | | | E Birch St | | | | E Birch St | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 1 | 1 | 1 | 0 | 1 | 0.5 | 0.5 | 0 | 1 | 2 | 0 | 0 | 1 | 2 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 7:00 AM | 5 | 2 | 14 | 0 | 5 | 4 | 3 | 0 | 5 | 68 | 12 | 1 | 9 | 54 | 3 | 0 | 185 |
| 7:15 AM | 3 | 3 | 16 | 0 | 5 | 5 | 7 | 0 | 5 | 95 | 22 | 0 | 11 | 77 | 4 | 0 | 253 |
| 7:30 AM | 4 | 4 | 17 | 0 | 9 | 4 | 3 | 0 | 2 | 133 | 13 | 1 | 9 | 90 | 8 | 0 | 297 |
| 7:45 AM | 6 | 7 | 23 | 0 | 10 | 5 | 6 | 0 | 6 | 170 | 21 | 0 | 15 | 127 | 12 | 0 | 408 |
| 8:00 AM | 5 | 15 | 13 | 0 | 3 | 7 | 7 | 0 | 11 | 116 | 28 | 0 | 13 | 93 | 8 | 0 | 319 |
| 8:15 AM | 4 | 6 | 18 | 0 | 15 | 12 | 5 | 0 | 7 | 110 | 18 | 1 | 13 | 129 | 12 | 1 | 351 |
| 8:30 AM | 6 | 10 | 27 | 0 | 7 | 9 | 6 | 0 | 12 | 132 | 16 | 0 | 25 | 97 | 9 | 0 | 356 |
| 8:45 AM | 7 | 11 | 17 | 0 | 6 | 6 | 6 | 0 | 15 | 115 | 15 | 0 | 22 | 112 | 7 | 1 | 340 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 40 | 58 | 145 | 0 | 60 | 52 | 43 | 0 | 63 | 939 | 145 | 3 | 117 | 779 | 63 | 2 | 2509 |
| **APPROACH %'s :** | 16.46% | 23.87% | 59.67% | 0.00% | 38.71% | 33.55% | 27.74% | 0.00% | 5.48% | 81.65% | 12.61% | 0.26% | 12.17% | 81.06% | 6.56% | 0.21% | |
| **PEAK HR :** | 07:45 AM - 08:45 AM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 21 | 38 | 81 | 0 | 35 | 33 | 24 | 0 | 36 | 528 | 83 | 1 | 66 | 446 | 41 | 1 | 1434 |
| **PEAK HR FACTOR :** | 0.875 | 0.633 | 0.750 | 0.000 | 0.583 | 0.688 | 0.857 | 0.000 | 0.750 | 0.776 | 0.741 | 0.250 | 0.660 | 0.864 | 0.854 | 0.250 | 0.879 |
| | 0.814 | | | | 0.719 | | | | 0.822 | | | | 0.894 | | | | |

| PM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 1 | 1 | 0 | 1 | 0.5 | 0.5 | 0 | 1 | 2 | 0 | 0 | 1 | 2 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 4:00 PM | 28 | 11 | 38 | 0 | 16 | 8 | 14 | 0 | 10 | 116 | 20 | 2 | 21 | 220 | 7 | 1 | 512 |
| 4:15 PM | 23 | 15 | 24 | 0 | 11 | 11 | 18 | 0 | 15 | 118 | 19 | 0 | 32 | 199 | 13 | 1 | 499 |
| 4:30 PM | 24 | 12 | 35 | 0 | 9 | 6 | 26 | 0 | 16 | 136 | 28 | 0 | 41 | 210 | 8 | 1 | 552 |
| 4:45 PM | 33 | 7 | 35 | 0 | 17 | 7 | 21 | 0 | 16 | 122 | 32 | 0 | 20 | 187 | 8 | 4 | 509 |
| 5:00 PM | 27 | 6 | 32 | 0 | 12 | 13 | 21 | 0 | 21 | 151 | 26 | 1 | 36 | 261 | 9 | 7 | 623 |
| 5:15 PM | 32 | 19 | 37 | 0 | 18 | 14 | 30 | 0 | 13 | 145 | 24 | 1 | 53 | 248 | 9 | 1 | 644 |
| 5:30 PM | 30 | 17 | 46 | 0 | 10 | 12 | 17 | 0 | 17 | 139 | 21 | 1 | 39 | 251 | 8 | 3 | 611 |
| 5:45 PM | 29 | 11 | 39 | 0 | 8 | 7 | 33 | 0 | 18 | 144 | 13 | 1 | 32 | 225 | 10 | 3 | 573 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 226 | 98 | 286 | 0 | 101 | 78 | 180 | 0 | 126 | 1071 | 183 | 6 | 274 | 1801 | 72 | 21 | 4523 |
| **APPROACH %'s :** | 37.05% | 16.07% | 46.89% | 0.00% | 28.13% | 21.73% | 50.14% | 0.00% | 9.09% | 77.27% | 13.20% | 0.43% | 12.64% | 83.07% | 3.32% | 0.97% | |
| **PEAK HR :** | 05:00 PM - 06:00 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 118 | 53 | 154 | 0 | 48 | 46 | 101 | 0 | 69 | 579 | 84 | 4 | 160 | 985 | 36 | 14 | 2451 |
| **PEAK HR FACTOR :** | 0.922 | 0.697 | 0.837 | 0.000 | 0.667 | 0.821 | 0.765 | 0.000 | 0.821 | 0.959 | 0.808 | 1.000 | 0.755 | 0.943 | 0.900 | 0.500 | 0.951 |
| | 0.874 | | | | 0.786 | | | | 0.925 | | | | 0.954 | | | | |

Prepared by National Data & Surveying Services

# Market Pl/S Randolph Ave & E Birch St

## Peak Hour Turning Movement Count

**ID:** 19-01101-008
**City:** Brea

**Day:** Wednesday
**Date:** 05/22/2019

| PEAK HOURS | COUNT PERIODS |
|---|---|
| 07:45 AM - 08:45 AM | 07:00 AM - 09:00 AM |
| NONE | NONE |
| 05:00 PM - 06:00 PM | 04:00 PM - 06:00 PM |

### Market Pl/S Randolph Ave — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 24 | 33 | 35 | 0 | 115 | AM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| PM | 101 | 46 | 48 | 0 | 158 | PM |
| | 0.5 | 0.5 | 1 | 0 | | |

### EASTBOUND — E Birch St

| AM | NOON | PM | |
|---|---|---|---|
| 492 | 0 | 1208 | |
| 1 | 0 | 4 | 0 |
| 36 | 0 | 69 | 1 |
| 528 | 0 | 579 | 2 |
| 83 | 0 | 84 | 0 |

### CONTROL

Signalized

| | AM | NOON | PM |
|---|---|---|---|
| TEV | 1434 | 0 | 2451 |
| PHF | 0.88 | | 0.95 |

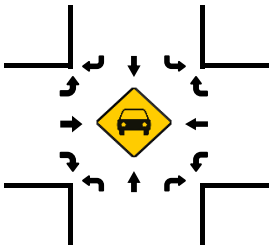
### WESTBOUND — E Birch St

| PM | NOON | AM | |
|---|---|---|---|
| 36 | 0 | 41 | 1 |
| 985 | 0 | 446 | 2 |
| 160 | 0 | 66 | 1 |
| 14 | 0 | 1 | 0 |
| 795 | 0 | 645 | |

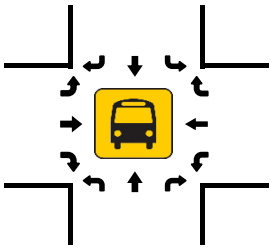
### Market Pl/S Randolph Ave — NORTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| | 0 | 1 | 1 | 1 | | |
| PM | 290 | 0 | 118 | 53 | 154 | PM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| AM | 182 | 0 | 21 | 38 | 81 | AM |

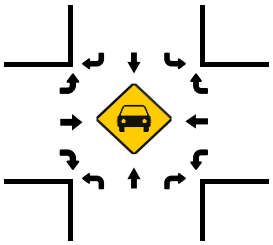
Total Vehicles (AM)



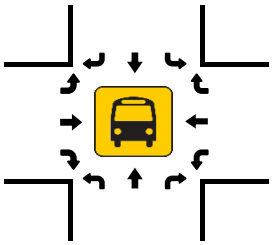
Total Vehicles (AM)



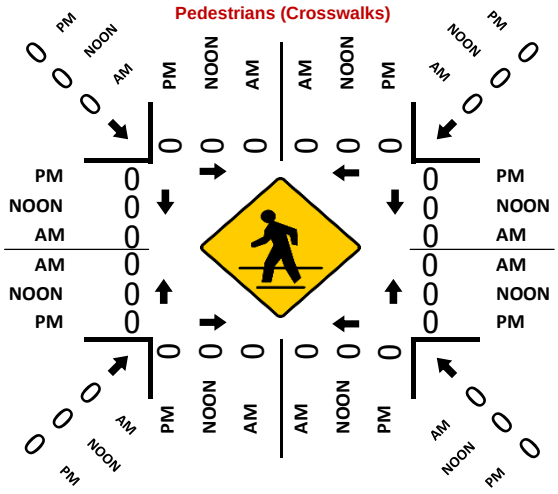
Total Vehicles (NOON)



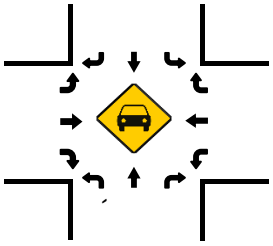
Total Vehicles (NOON)



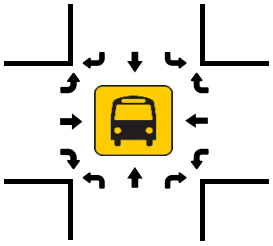
Pedestrians (Crosswalks)




Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** Market Pl/S Randolph Ave & E Birch St
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01101-008
**Date:** 5/18/2019

**Total**

| NS/EW Streets: | Market Pl/S Randolph Ave | | | | Market Pl/S Randolph Ave | | | | E Birch St | | | | E Birch St | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NOON** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 1 | 1 | 1 | 0 | 1 | 0.5 | 0.5 | 0 | 1 | 2 | 0 | 0 | 1 | 2 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 11:00 AM | 20 | 13 | 42 | 0 | 10 | 10 | 18 | 0 | 17 | 104 | 22 | 2 | 35 | 116 | 9 | 0 | 418 |
| 11:15 AM | 17 | 16 | 47 | 0 | 7 | 14 | 14 | 0 | 20 | 110 | 17 | 1 | 23 | 124 | 8 | 2 | 420 |
| 11:30 AM | 18 | 12 | 47 | 0 | 9 | 7 | 17 | 0 | 17 | 113 | 26 | 0 | 32 | 131 | 13 | 3 | 445 |
| 11:45 AM | 10 | 14 | 36 | 0 | 9 | 9 | 14 | 0 | 19 | 150 | 21 | 2 | 41 | 166 | 7 | 2 | 500 |
| 12:00 PM | 29 | 15 | 51 | 0 | 12 | 10 | 12 | 0 | 18 | 115 | 24 | 0 | 47 | 164 | 5 | 1 | 503 |
| 12:15 PM | 18 | 13 | 37 | 0 | 9 | 5 | 13 | 0 | 28 | 131 | 19 | 1 | 37 | 170 | 4 | 3 | 488 |
| 12:30 PM | 21 | 22 | 34 | 0 | 14 | 6 | 18 | 0 | 14 | 158 | 21 | 2 | 28 | 177 | 4 | 1 | 520 |
| 12:45 PM | 24 | 16 | 51 | 0 | 12 | 10 | 21 | 0 | 20 | 127 | 35 | 1 | 31 | 159 | 7 | 1 | 515 |
| 1:00 PM | 21 | 19 | 38 | 0 | 16 | 14 | 21 | 0 | 15 | 121 | 33 | 1 | 37 | 170 | 9 | 1 | 516 |
| 1:15 PM | 25 | 23 | 52 | 0 | 7 | 18 | 12 | 0 | 17 | 112 | 11 | 0 | 26 | 150 | 3 | 5 | 461 |
| 1:30 PM | 19 | 17 | 43 | 0 | 14 | 12 | 15 | 0 | 14 | 134 | 17 | 1 | 29 | 159 | 3 | 2 | 479 |
| 1:45 PM | 18 | 26 | 38 | 0 | 14 | 8 | 18 | 0 | 15 | 124 | 20 | 0 | 34 | 139 | 6 | 0 | 460 |
| 2:00 PM | 21 | 16 | 38 | 0 | 5 | 14 | 12 | 0 | 9 | 121 | 27 | 0 | 22 | 142 | 7 | 0 | 434 |
| 2:15 PM | 22 | 16 | 43 | 0 | 7 | 14 | 11 | 0 | 19 | 119 | 28 | 2 | 48 | 154 | 10 | 3 | 496 |
| 2:30 PM | 29 | 21 | 54 | 0 | 9 | 5 | 20 | 0 | 12 | 100 | 21 | 0 | 23 | 147 | 6 | 0 | 447 |
| 2:45 PM | 24 | 12 | 47 | 0 | 13 | 9 | 12 | 0 | 16 | 111 | 19 | 0 | 42 | 166 | 14 | 3 | 488 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 336 | 271 | 698 | 0 | 167 | 165 | 248 | 0 | 270 | 1950 | 361 | 13 | 535 | 2434 | 115 | 27 | 7590 |
| **APPROACH %'s :** | 25.75% | 20.77% | 53.49% | 0.00% | 28.79% | 28.45% | 42.76% | 0.00% | 10.41% | 75.17% | 13.92% | 0.50% | 17.20% | 78.24% | 3.70% | 0.87% | |
| **PEAK HR :** | 12:15 PM - 01:15 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 84 | 70 | 160 | 0 | 51 | 35 | 73 | 0 | 77 | 537 | 108 | 5 | 133 | 676 | 24 | 6 | 2039 |
| **PEAK HR FACTOR :** | 0.875 | 0.795 | 0.784 | 0.000 | 0.797 | 0.625 | 0.869 | 0.000 | 0.688 | 0.850 | 0.771 | 0.625 | 0.899 | 0.955 | 0.667 | 0.500 | 0.980 |
| | 0.863 | | | | 0.779 | | | | 0.932 | | | | 0.967 | | | | |

Prepared by National Data & Surveying Services

# Market Pl/S Randolph Ave & E Birch St

## Peak Hour Turning Movement Count

**ID:** 19-01101-008
**City:** Brea

**Day:** Saturday
**Date:** 05/18/2019

**PEAK HOURS**

AM: NONE
NOON: 12:15 PM - 01:15 PM
PM: NONE

**COUNT PERIODS**

AM: NONE
NOON: 11:00 AM - 03:00 PM
PM: NONE

### Market Pl/S Randolph Ave — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 0 | 0 | 0 | 0 | 0 | AM |
| NOON | 73 | 35 | 51 | 0 | 171 | NOON |
| PM | 0 | 0 | 0 | 0 | 0 | PM |
| | 0.5 | 0.5 | 1 | 0 | | |

### E Birch St — EASTBOUND

| AM | NOON | PM | | |
|---|---|---|---|---|
| 0 | 838 | 0 | | |
| 0 | 5 | 0 | 0 | |
| 0 | 77 | 0 | 1 | |
| 0 | 537 | 0 | 2 | |
| 0 | 108 | 0 | 0 | |
| AM | NOON | PM | | |

### CONTROL

Signalized

| | AM | NOON | PM |
|---|---|---|---|
| TEV | 0 | 2039 | 0 |
| PHF | | 0.98 | |

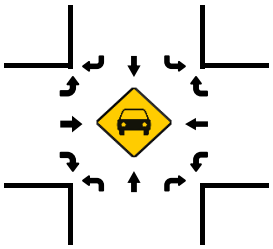
### E Birch St — WESTBOUND

| | PM | NOON | AM |
|---|---|---|---|
| 1 | 0 | 24 | 0 |
| 2 | 0 | 676 | 0 |
| 1 | 0 | 133 | 0 |
| 0 | 0 | 6 | 0 |
| | 0 | 754 | 0 |
| | PM | NOON | AM |

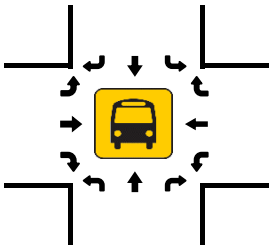
### Market Pl/S Randolph Ave — NORTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| | 0 | 1 | 1 | 1 | | |
| PM | 0 | 0 | 0 | 0 | 0 | PM |
| NOON | 276 | 0 | 84 | 70 | 160 | NOON |
| AM | 0 | 0 | 0 | 0 | 0 | AM |

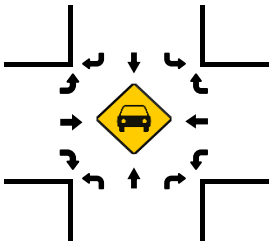
Total Vehicles (AM)



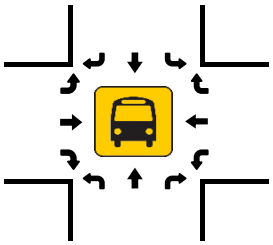
Total Vehicles (AM)



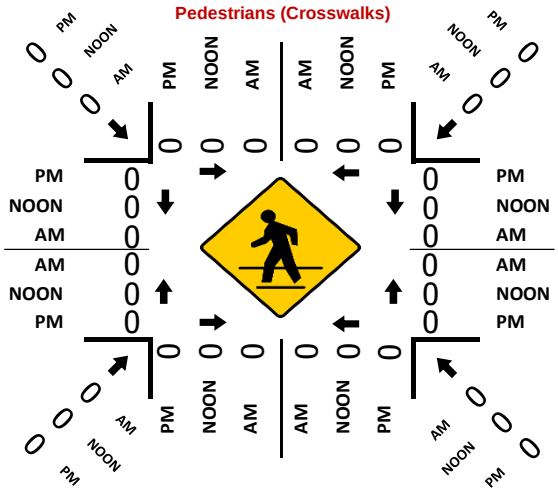
Total Vehicles (NOON)



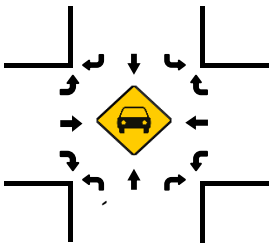
Total Vehicles (NOON)



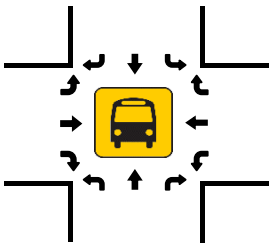
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** State College Blvd & Birch St
**City:** Brea
**Control:** Signalized

**Project ID:** 18-01231-005
**Date:** 11/13/2018

**Total**

| NS/EW Streets: | State College Blvd | | | | State College Blvd | | | | Birch St | | | | Birch St | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 2 | 2 | 1 | 0 | 2 | 2 | 0 | 0 | 2 | 2 | 1 | 0 | 2 | 2 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 7:00 AM | 12 | 23 | 11 | 0 | 116 | 168 | 22 | 0 | 16 | 95 | 7 | 0 | 20 | 76 | 40 | 0 | 606 |
| 7:15 AM | 21 | 19 | 19 | 0 | 131 | 235 | 13 | 0 | 9 | 89 | 10 | 0 | 20 | 85 | 43 | 0 | 694 |
| 7:30 AM | 14 | 22 | 24 | 0 | 160 | 220 | 30 | 0 | 20 | 137 | 14 | 0 | 10 | 114 | 58 | 0 | 823 |
| 7:45 AM | 20 | 34 | 27 | 0 | 184 | 144 | 49 | 0 | 23 | 121 | 8 | 0 | 19 | 172 | 88 | 0 | 889 |
| 8:00 AM | 16 | 37 | 20 | 0 | 117 | 134 | 45 | 0 | 18 | 126 | 13 | 0 | 23 | 153 | 68 | 0 | 770 |
| 8:15 AM | 17 | 35 | 17 | 0 | 99 | 104 | 44 | 0 | 27 | 84 | 10 | 0 | 34 | 137 | 55 | 0 | 663 |
| 8:30 AM | 11 | 39 | 15 | 0 | 64 | 81 | 51 | 0 | 28 | 65 | 11 | 0 | 18 | 127 | 43 | 0 | 553 |
| 8:45 AM | 20 | 33 | 9 | 0 | 73 | 84 | 59 | 0 | 12 | 82 | 17 | 0 | 23 | 117 | 43 | 0 | 572 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 131 | 242 | 142 | 0 | 944 | 1170 | 313 | 0 | 153 | 799 | 90 | 0 | 167 | 981 | 438 | 0 | 5570 |
| **APPROACH %'s :** | 25.44% | 46.99% | 27.57% | 0.00% | 38.90% | 48.21% | 12.90% | 0.00% | 14.68% | 76.68% | 8.64% | 0.00% | 10.53% | 61.85% | 27.62% | 0.00% | |
| **PEAK HR :** | 07:15 AM - 08:15 AM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 71 | 112 | 90 | 0 | 592 | 733 | 137 | 0 | 70 | 473 | 45 | 0 | 72 | 524 | 257 | 0 | 3176 |
| **PEAK HR FACTOR :** | 0.845 | 0.757 | 0.833 | 0.000 | 0.804 | 0.780 | 0.699 | 0.000 | 0.761 | 0.863 | 0.804 | 0.000 | 0.783 | 0.762 | 0.730 | 0.000 | 0.893 |
| | 0.843 | | | | 0.891 | | | | 0.860 | | | | 0.764 | | | | |

| PM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 2 | 1 | 0 | 2 | 2 | 0 | 0 | 2 | 2 | 1 | 0 | 2 | 2 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 4:00 PM | 27 | 67 | 34 | 0 | 62 | 71 | 55 | 0 | 54 | 139 | 44 | 0 | 28 | 163 | 82 | 0 | 826 |
| 4:15 PM | 33 | 83 | 36 | 0 | 67 | 65 | 64 | 0 | 43 | 153 | 29 | 0 | 33 | 150 | 102 | 0 | 858 |
| 4:30 PM | 33 | 71 | 47 | 0 | 70 | 79 | 58 | 0 | 32 | 138 | 31 | 0 | 27 | 200 | 116 | 0 | 902 |
| 4:45 PM | 31 | 75 | 35 | 0 | 87 | 72 | 58 | 0 | 35 | 161 | 29 | 0 | 33 | 238 | 145 | 0 | 999 |
| 5:00 PM | 24 | 75 | 43 | 0 | 62 | 72 | 65 | 0 | 48 | 170 | 46 | 0 | 33 | 231 | 153 | 0 | 1022 |
| 5:15 PM | 31 | 85 | 41 | 0 | 70 | 83 | 56 | 0 | 43 | 184 | 30 | 0 | 29 | 223 | 146 | 0 | 1021 |
| 5:30 PM | 45 | 92 | 27 | 0 | 72 | 73 | 64 | 1 | 57 | 184 | 41 | 0 | 36 | 203 | 123 | 0 | 1018 |
| 5:45 PM | 34 | 84 | 34 | 0 | 54 | 71 | 77 | 2 | 48 | 158 | 39 | 0 | 46 | 168 | 101 | 0 | 916 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 258 | 632 | 297 | 0 | 544 | 586 | 497 | 3 | 360 | 1287 | 289 | 0 | 265 | 1576 | 968 | 0 | 7562 |
| **APPROACH %'s :** | 21.74% | 53.24% | 25.02% | 0.00% | 33.37% | 35.95% | 30.49% | 0.18% | 18.60% | 66.48% | 14.93% | 0.00% | 9.43% | 56.11% | 34.46% | 0.00% | |
| **PEAK HR :** | 04:45 PM - 05:45 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 131 | 327 | 146 | 0 | 291 | 300 | 243 | 1 | 183 | 699 | 146 | 0 | 131 | 895 | 567 | 0 | 4060 |
| **PEAK HR FACTOR :** | 0.728 | 0.889 | 0.849 | 0.000 | 0.836 | 0.904 | 0.935 | 0.250 | 0.803 | 0.950 | 0.793 | 0.000 | 0.910 | 0.940 | 0.926 | 0.000 | 0.993 |
| | 0.921 | | | | 0.962 | | | | 0.911 | | | | 0.955 | | | | |

Prepared by National Data & Surveying Services

# State College Blvd & Birch St

## Peak Hour Turning Movement Count

**ID:** 18-01231-005
**City:** Brea

**Day:** Tuesday
**Date:** 11/13/2018

| PEAK HOURS | |
|---|---|
| AM | 07:15 AM - 08:15 AM |
| NOON | NONE |
| PM | 04:45 PM - 05:45 PM |

| COUNT PERIODS | |
|---|---|
| AM | 07:00 AM - 09:00 AM |
| NOON | NONE |
| PM | 04:00 PM - 06:00 PM |

### State College Blvd — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 137 | 733 | 592 | 0 | 439 | AM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| PM | 243 | 300 | 291 | 1 | 1078 | PM |
| | 0 | 2 | 2 | 0 | | |

### Birch St — EASTBOUND

| AM | NOON | PM | |
|---|---|---|---|
| 732 | 0 | 1269 | |
| 0 | 0 | 0 | 0 |
| 70 | 0 | 183 | 2 |
| 473 | 0 | 699 | 2 |
| 45 | 0 | 146 | 1 |
| AM | NOON | PM | |

### CONTROL

Signalized

| | AM | NOON | PM |
|---|---|---|---|
| TEV | 3176 | 0 | 4060 |
| PHF | 0.89 | | 0.99 |

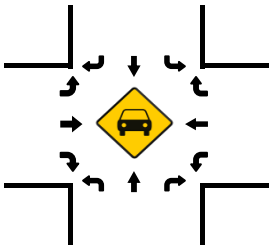
### WESTBOUND — Birch St

| | PM | NOON | AM |
|---|---|---|---|
| 1 | 567 | 0 | 257 |
| 2 | 895 | 0 | 524 |
| 2 | 131 | 0 | 72 |
| 0 | 0 | 0 | 0 |
| | 1136 | 0 | 1155 |

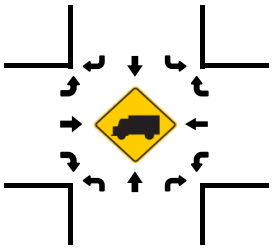
### State College Blvd — NORTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| PM | 577 | 0 | 131 | 327 | 146 | PM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| AM | 850 | 0 | 71 | 112 | 90 | AM |
| | | 0 | 2 | 2 | 1 | |

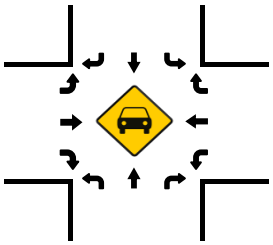
Total Vehicles (AM)



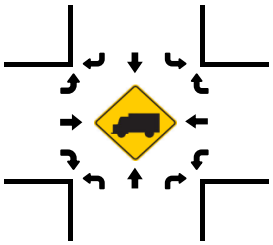
2axle (AM)



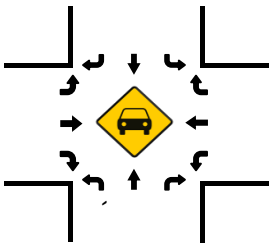
Total Vehicles (Noon)



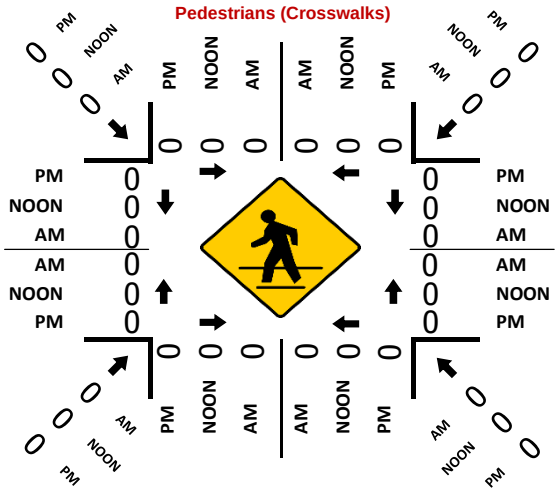
2axle (NOON)



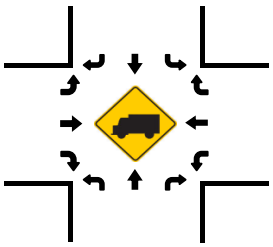
Total Vehicles (PM)



Pedestrians (Crosswalks)



2axle (PM)



# INTERSECTION TURNING MOVEMENT COUNTS

T418

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Sat, May 18, 19

LOCATION: Brea
NORTH & SOUTH: State College
EAST & WEST: Birch

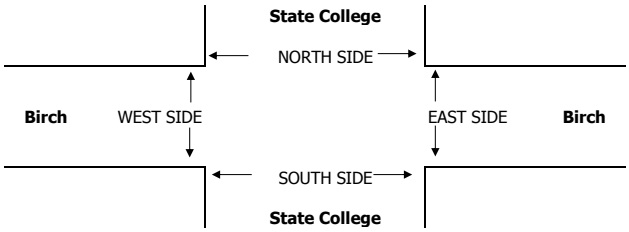
PROJECT #: SC2213
LOCATION #: 1
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

☑ Add U-Turns to Left Turns

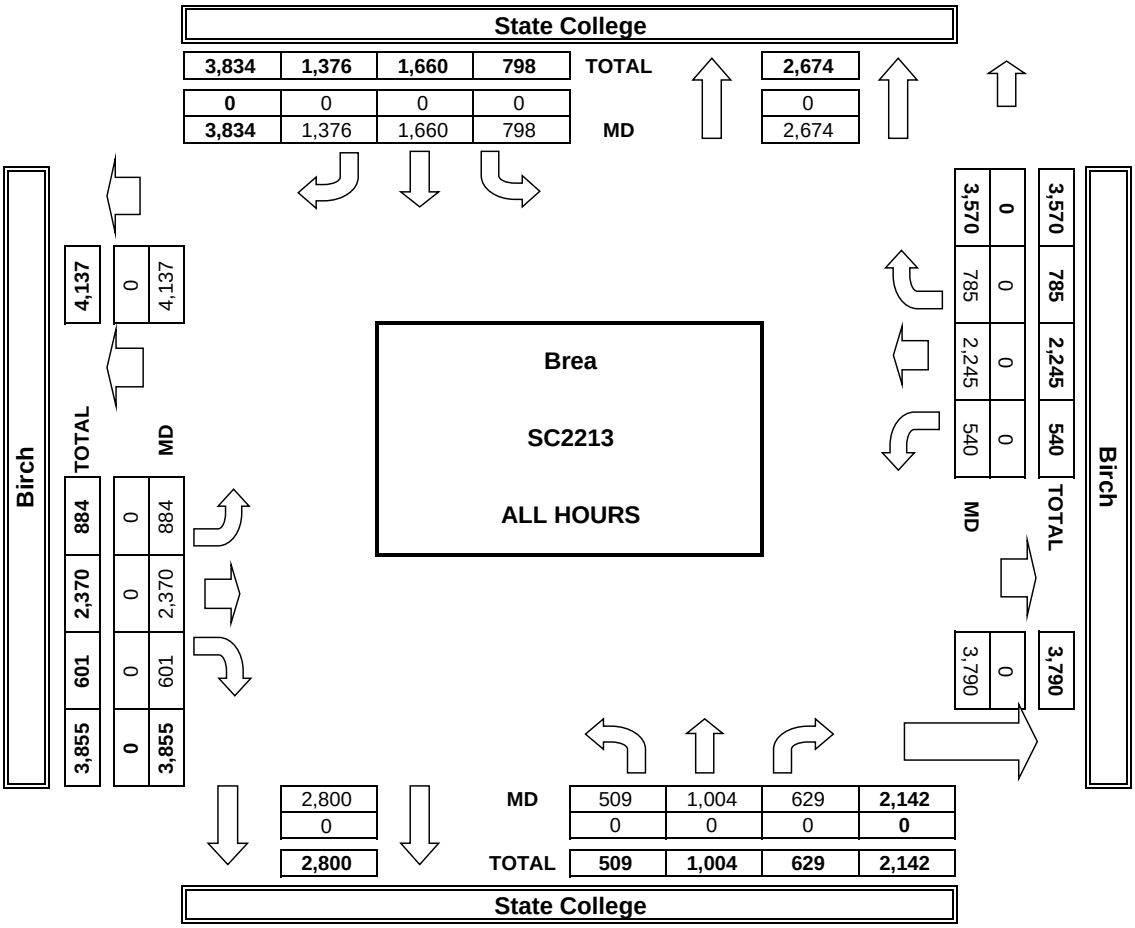
| | | NORTHBOUND State College | | | SOUTHBOUND State College | | | EASTBOUND Birch | | | WESTBOUND Birch | | | | U-TURNS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LANES: | NL 2 | NT 2 | NR 1 | SL 2 | ST 2 | SR 0 | EL 2 | ET 2 | ER 1 | WL 2 | WT 2 | WR 1 | TOTAL | NB 0 | SB 0 | EB 0 | WB 0 | TTL |
| MD | 11:00 AM | 26 | 36 | 27 | 35 | 83 | 69 | 37 | 117 | 32 | 32 | 147 | 40 | 681 | 0 | 0 | 0 | 0 | 0 |
| | 11:15 AM | 33 | 63 | 22 | 39 | 102 | 78 | 44 | 107 | 35 | 35 | 142 | 44 | 744 | 0 | 0 | 0 | 0 | 0 |
| | 11:30 AM | 30 | 62 | 28 | 41 | 92 | 84 | 54 | 130 | 27 | 35 | 141 | 46 | 770 | 0 | 2 | 1 | 1 | 4 |
| | 11:45 AM | 29 | 52 | 33 | 67 | 98 | 89 | 40 | 154 | 46 | 37 | 175 | 55 | 875 | 0 | 0 | 0 | 0 | 0 |
| | 12:00 PM | 24 | 57 | 37 | 61 | 119 | 95 | 55 | 148 | 40 | 39 | 160 | 46 | 881 | 0 | 1 | 1 | 0 | 2 |
| | 12:15 PM | 37 | 60 | 40 | 73 | 126 | 97 | 51 | 158 | 35 | 40 | 150 | 51 | 918 | 0 | 1 | 0 | 0 | 1 |
| | 12:30 PM | 35 | 59 | 45 | 46 | 125 | 104 | 60 | 180 | 44 | 44 | 170 | 52 | 964 | 0 | 1 | 1 | 0 | 2 |
| | 12:45 PM | 21 | 66 | 44 | 60 | 145 | 113 | 48 | 172 | 35 | 31 | 145 | 57 | 937 | 0 | 0 | 1 | 0 | 1 |
| | 1:00 PM | 40 | 49 | 51 | 55 | 98 | 82 | 62 | 156 | 36 | 32 | 140 | 54 | 855 | 0 | 0 | 0 | 0 | 0 |
| | 1:15 PM | 38 | 78 | 42 | 65 | 101 | 60 | 58 | 153 | 42 | 34 | 127 | 35 | 833 | 0 | 1 | 1 | 0 | 2 |
| | 1:30 PM | 41 | 70 | 37 | 51 | 98 | 71 | 53 | 164 | 46 | 35 | 128 | 50 | 844 | 0 | 2 | 0 | 0 | 2 |
| | 1:45 PM | 25 | 69 | 45 | 56 | 110 | 90 | 76 | 149 | 42 | 26 | 138 | 55 | 881 | 0 | 0 | 1 | 0 | 1 |
| | 2:00 PM | 34 | 69 | 36 | 36 | 74 | 78 | 66 | 140 | 35 | 28 | 117 | 58 | 771 | 0 | 0 | 1 | 0 | 1 |
| | 2:15 PM | 32 | 62 | 52 | 30 | 94 | 95 | 58 | 139 | 30 | 32 | 110 | 57 | 791 | 0 | 0 | 0 | 0 | 0 |
| | 2:30 PM | 28 | 81 | 43 | 33 | 77 | 79 | 65 | 159 | 36 | 37 | 122 | 45 | 805 | 0 | 0 | 0 | 0 | 0 |
| | 2:45 PM | 36 | 71 | 47 | 50 | 118 | 92 | 57 | 144 | 40 | 23 | 133 | 40 | 851 | 0 | 0 | 0 | 0 | 0 |
| | VOLUMES | 509 | 1,004 | 629 | 798 | 1,660 | 1,376 | 884 | 2,370 | 601 | 540 | 2,245 | 785 | 13,401 | 0 | 8 | 7 | 1 | 16 |
| | APPROACH % | 24% | 47% | 29% | 21% | 43% | 36% | 23% | 61% | 16% | 15% | 63% | 22% | | | | | | |
| | APP/DEPART | 2,142 | / | 2,674 | 3,834 | / | 2,800 | 3,855 | / | 3,790 | 3,570 | / | 4,137 | 0 | | | | | |
| | BEGIN PEAK HR | | 12:00 PM | | | | | | | | | | | | | | | | |
| | VOLUMES | 117 | 242 | 166 | 240 | 515 | 409 | 214 | 658 | 154 | 154 | 625 | 206 | 3,700 | | | | | |
| | APPROACH % | 22% | 46% | 32% | 21% | 44% | 35% | 21% | 64% | 15% | 16% | 63% | 21% | | | | | | |
| | PEAK HR FACTOR | | 0.944 | | | 0.915 | | | 0.903 | | | 0.926 | | 0.960 | | | | | |
| | APP/DEPART | 525 | / | 662 | 1,164 | / | 823 | 1,026 | / | 1,061 | 985 | / | 1,154 | 0 | | | | | |

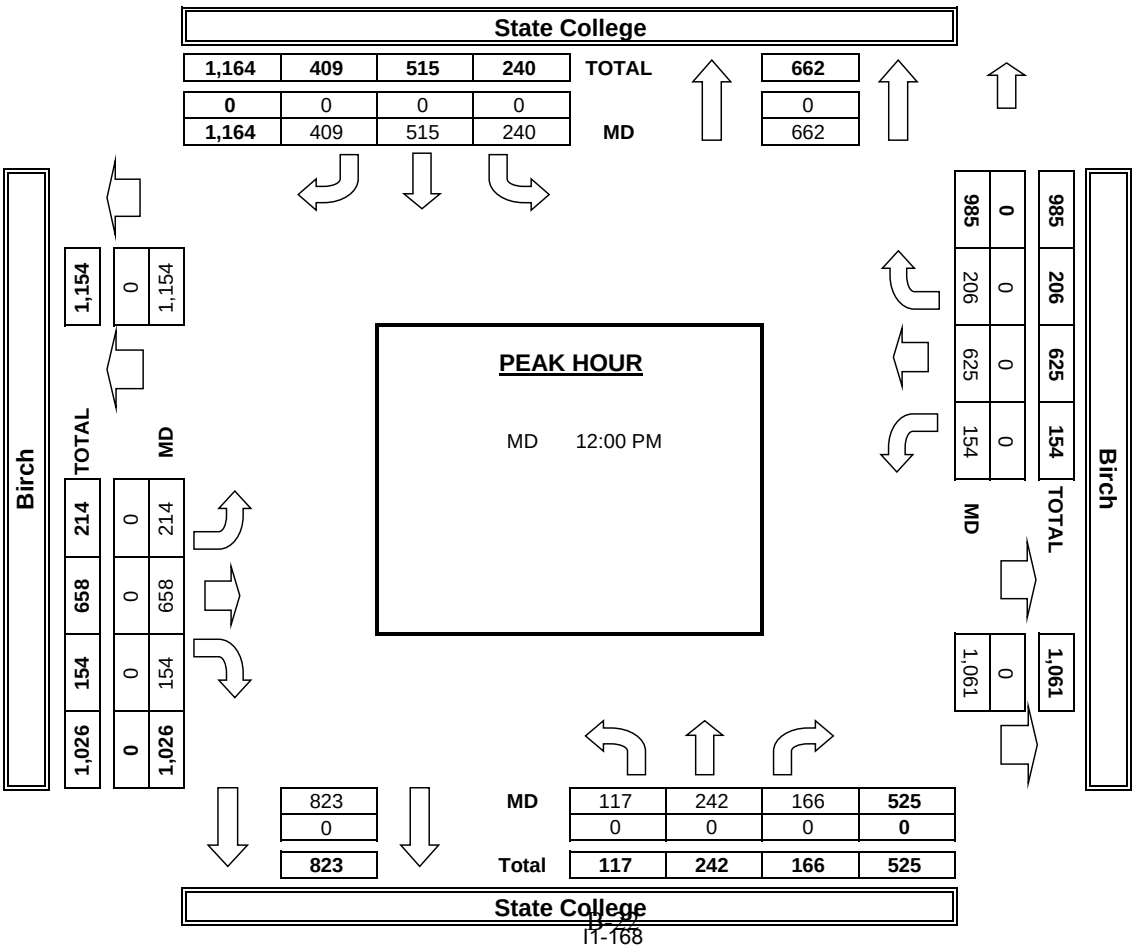



| | | PEDESTRIAN + BIKE CROSSINGS | | | | | PEDESTRIAN CROSSINGS | | | | | BICYCLE CROSSINGS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | NS | SS | ES | WS | TOTAL |
| MD | 11:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 11:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 11:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 11:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | AM BEGIN PEAK HR | 12:00 PM | | | | | 0 | 0 | 0 | 0 | 0 | | | | | |

**AimTD LLC**

TURNING MOVEMENT COUNTS



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** S Associated Rd & Birch St
**City:** Brea
**Control:** Signalized

**Project ID:** 18-01231-006
**Date:** 11/13/2018

**Total**

| NS/EW Streets: | S Associated Rd | | | | S Associated Rd | | | | Birch St | | | | Birch St | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 2 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 7:00 AM | 20 | 0 | 51 | 4 | 5 | 4 | 0 | 0 | 0 | 155 | 71 | 0 | 74 | 88 | 1 | 0 | 473 |
| 7:15 AM | 23 | 0 | 45 | 0 | 10 | 4 | 5 | 0 | 0 | 157 | 73 | 0 | 66 | 104 | 0 | 0 | 487 |
| 7:30 AM | 40 | 1 | 58 | 7 | 9 | 13 | 3 | 0 | 1 | 220 | 86 | 0 | 80 | 134 | 4 | 0 | 656 |
| 7:45 AM | 50 | 1 | 66 | 6 | 14 | 6 | 1 | 0 | 0 | 249 | 85 | 0 | 77 | 206 | 0 | 0 | 761 |
| 8:00 AM | 47 | 3 | 69 | 10 | 6 | 3 | 2 | 0 | 0 | 228 | 68 | 0 | 84 | 194 | 1 | 0 | 715 |
| 8:15 AM | 54 | 1 | 96 | 7 | 22 | 5 | 2 | 0 | 1 | 160 | 46 | 0 | 81 | 169 | 5 | 0 | 649 |
| 8:30 AM | 53 | 1 | 47 | 8 | 5 | 3 | 2 | 0 | 3 | 99 | 52 | 0 | 75 | 120 | 3 | 0 | 471 |
| 8:45 AM | 43 | 0 | 41 | 6 | 5 | 5 | 2 | 0 | 1 | 101 | 60 | 0 | 45 | 138 | 2 | 0 | 449 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 330 | 7 | 473 | 48 | 76 | 43 | 17 | 0 | 6 | 1369 | 541 | 0 | 582 | 1153 | 16 | 0 | 4661 |
| **APPROACH %'s :** | 38.46% | 0.82% | 55.13% | 5.59% | 55.88% | 31.62% | 12.50% | 0.00% | 0.31% | 71.45% | 28.24% | 0.00% | 33.24% | 65.85% | 0.91% | 0.00% | |
| **PEAK HR :** | 07:30 AM - 08:30 AM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 191 | 6 | 289 | 30 | 51 | 27 | 8 | 0 | 2 | 857 | 285 | 0 | 322 | 703 | 10 | 0 | 2781 |
| **PEAK HR FACTOR :** | 0.884 | 0.500 | 0.753 | 0.750 | 0.580 | 0.519 | 0.667 | 0.000 | 0.500 | 0.860 | 0.828 | 0.000 | 0.958 | 0.853 | 0.500 | 0.000 | 0.914 |
| | | | 0.816 | | | | 0.741 | | | | 0.856 | | | | 0.914 | | |

| PM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 4:00 PM | 81 | 4 | 56 | 2 | 2 | 2 | 2 | 0 | 0 | 167 | 58 | 1 | 66 | 199 | 6 | 0 | 646 |
| 4:15 PM | 86 | 2 | 68 | 2 | 1 | 2 | 2 | 0 | 0 | 186 | 62 | 0 | 59 | 194 | 3 | 0 | 667 |
| 4:30 PM | 99 | 4 | 67 | 3 | 3 | 1 | 1 | 0 | 0 | 200 | 60 | 0 | 60 | 260 | 5 | 0 | 763 |
| 4:45 PM | 124 | 7 | 74 | 5 | 3 | 3 | 1 | 0 | 5 | 196 | 66 | 0 | 60 | 276 | 5 | 0 | 825 |
| 5:00 PM | 120 | 9 | 77 | 4 | 2 | 6 | 2 | 0 | 1 | 196 | 76 | 1 | 76 | 279 | 5 | 0 | 854 |
| 5:15 PM | 95 | 7 | 87 | 2 | 3 | 5 | 2 | 0 | 1 | 209 | 61 | 2 | 77 | 299 | 2 | 0 | 852 |
| 5:30 PM | 81 | 7 | 85 | 3 | 2 | 4 | 1 | 0 | 2 | 203 | 67 | 0 | 54 | 288 | 4 | 0 | 801 |
| 5:45 PM | 80 | 5 | 74 | 3 | 5 | 4 | 2 | 0 | 3 | 181 | 53 | 0 | 57 | 217 | 6 | 0 | 690 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 766 | 45 | 588 | 24 | 21 | 27 | 13 | 0 | 12 | 1538 | 503 | 4 | 509 | 2012 | 36 | 0 | 6098 |
| **APPROACH %'s :** | 53.83% | 3.16% | 41.32% | 1.69% | 34.43% | 44.26% | 21.31% | 0.00% | 0.58% | 74.77% | 24.45% | 0.19% | 19.91% | 78.69% | 1.41% | 0.00% | |
| **PEAK HR :** | 04:45 PM - 05:45 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 420 | 30 | 323 | 14 | 10 | 18 | 6 | 0 | 9 | 804 | 270 | 3 | 267 | 1142 | 16 | 0 | 3332 |
| **PEAK HR FACTOR :** | 0.847 | 0.833 | 0.928 | 0.700 | 0.833 | 0.750 | 0.750 | 0.000 | 0.450 | 0.962 | 0.888 | 0.375 | 0.867 | 0.955 | 0.800 | 0.000 | 0.975 |
| | | | 0.937 | | | | 0.850 | | | | 0.991 | | | | 0.942 | | |

Prepared by National Data & Surveying Services

# S Associated Rd & Birch St

## Peak Hour Turning Movement Count

**ID:** 18-01231-006
**City:** Brea

**Day:** Tuesday
**Date:** 11/13/2018

| PEAK HOURS | COUNT PERIODS |
|---|---|
| 07:30 AM - 08:30 AM | 07:00 AM - 09:00 AM |
| NONE | NONE |
| 04:45 PM - 05:45 PM | 04:00 PM - 06:00 PM |

### S Associated Rd — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 8 | 27 | 51 | 0 | 18 | AM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| PM | 6 | 18 | 10 | 0 | 55 | PM |

### Birch St — EASTBOUND

| AM | NOON | PM | |
|---|---|---|---|
| 902 | 0 | 1571 | |
| 0 | 0 | 3 | 0 |
| 2 | 0 | 9 | 1 |
| 857 | 0 | 804 | 2 |
| 285 | 0 | 270 | 0 |

### Birch St — WESTBOUND

| PM | NOON | AM | |
|---|---|---|---|
| 16 | 0 | 10 | 0 |
| 1142 | 0 | 703 | 2 |
| 267 | 0 | 322 | 2 |
| 0 | 0 | 0 | 0 |
| 1137 | 0 | 1197 | |

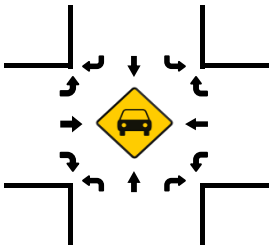
### S Associated Rd — NORTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| PM | 569 | 14 | 420 | 30 | 323 | PM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| AM | 664 | 30 | 191 | 6 | 289 | AM |

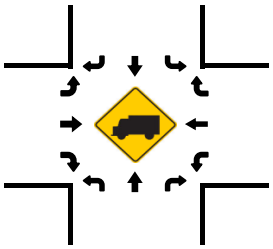
**CONTROL:** Signalized

| | | | |
|---|---|---|---|
| TEV | 2781 | 0 | 3332 |
| | AM | NOON | PM |
| PHF | 0.91 | | 0.98 |

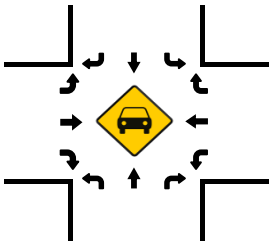
Total Vehicles (AM)



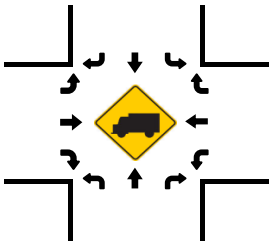
2axle (AM)



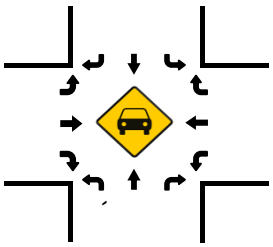
Total Vehicles (Noon)



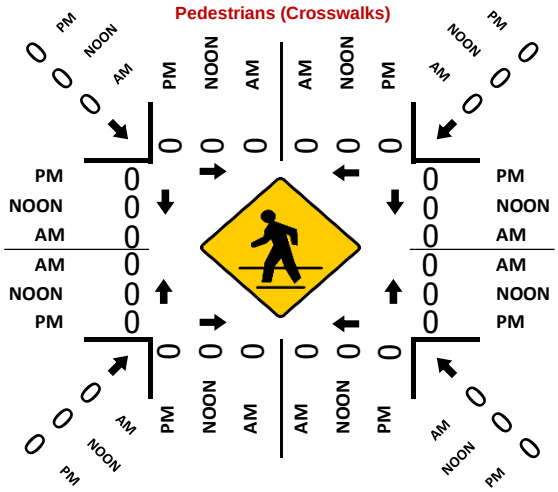
2axle (NOON)



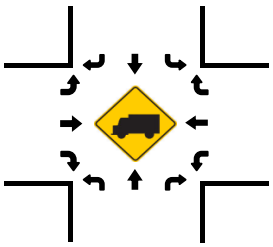
Total Vehicles (PM)



Pedestrians (Crosswalks)



2axle (PM)



# INTERSECTION TURNING MOVEMENT COUNTS

T418

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Sat, May 18, 19

LOCATION: Brea
NORTH & SOUTH: S Associated
EAST & WEST: Birch

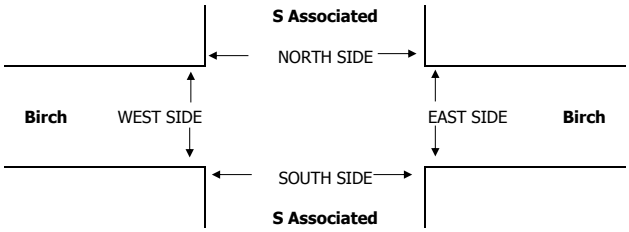
PROJECT #: SC2213
LOCATION #: 2
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER

☑ Add U-Turns to Left Turns

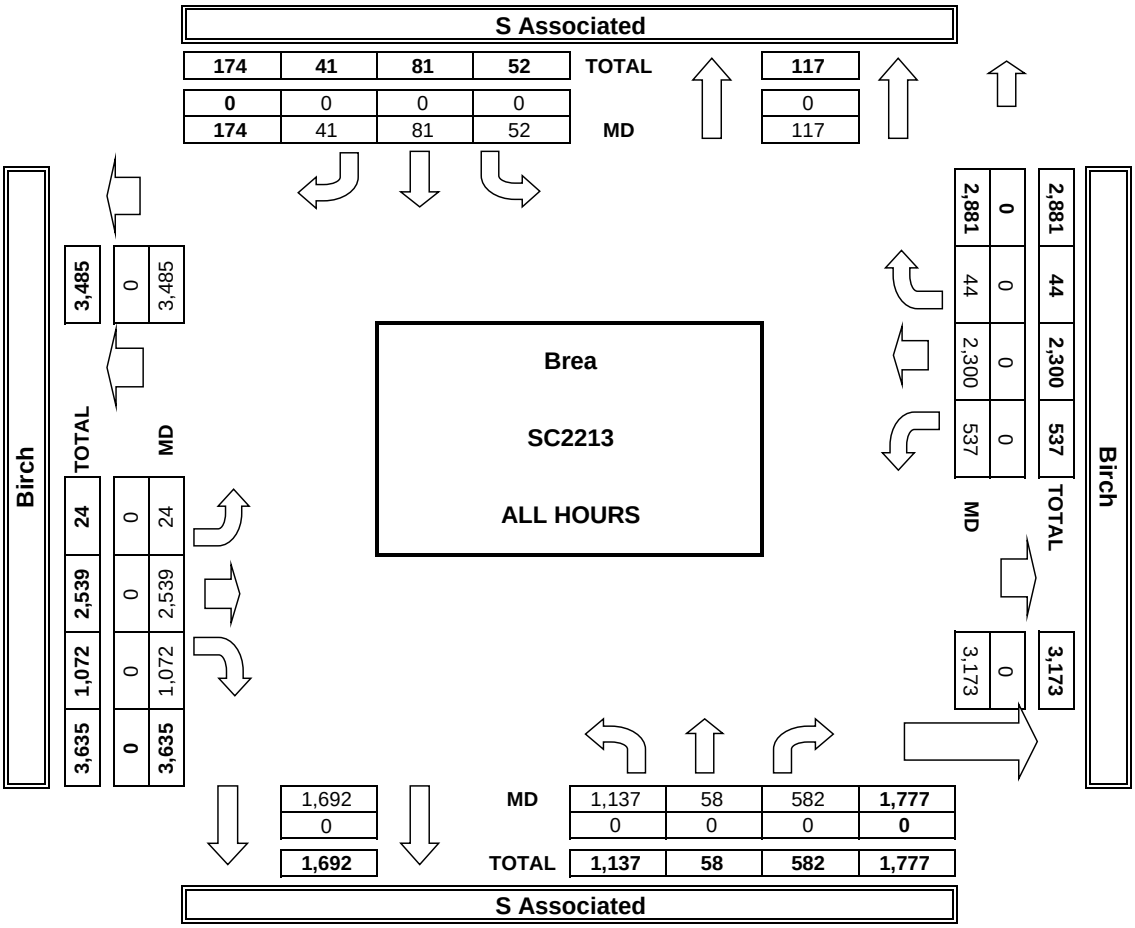
| | | NORTHBOUND S Associated | | | SOUTHBOUND S Associated | | | EASTBOUND Birch | | | WESTBOUND Birch | | | | U-TURNS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LANES: | NL 2 | NT 1 | NR 1 | SL 1 | ST 1 | SR 0 | EL 1 | ET 2 | ER 0 | WL 2 | WT 2 | WR 0 | TOTAL | NB 0 | SB 0 | EB 0 | WB 0 | TTL |
| MD | 11:00 AM | 66 | 2 | 32 | 1 | 5 | 3 | 1 | 107 | 45 | 34 | 146 | 4 | 446 | 0 | 0 | 0 | 0 | 0 |
| | 11:15 AM | 62 | 3 | 27 | 7 | 5 | 5 | 1 | 130 | 49 | 35 | 141 | 2 | 467 | 0 | 0 | 0 | 0 | 0 |
| | 11:30 AM | 59 | 2 | 33 | 5 | 9 | 5 | 2 | 129 | 67 | 33 | 156 | 5 | 505 | 0 | 0 | 1 | 0 | 1 |
| | 11:45 AM | 88 | 6 | 31 | 6 | 4 | 4 | 1 | 152 | 71 | 32 | 157 | 4 | 556 | 0 | 0 | 1 | 0 | 1 |
| | 12:00 PM | 80 | 6 | 38 | 3 | 7 | 5 | 2 | 154 | 74 | 48 | 156 | 1 | 574 | 1 | 0 | 1 | 0 | 2 |
| | 12:15 PM | 71 | 3 | 37 | 0 | 7 | 2 | 3 | 164 | 85 | 27 | 155 | 4 | 558 | 1 | 0 | 2 | 0 | 3 |
| | 12:30 PM | 83 | 2 | 40 | 3 | 6 | 4 | 3 | 169 | 75 | 29 | 170 | 2 | 586 | 0 | 0 | 0 | 0 | 0 |
| | 12:45 PM | 69 | 7 | 44 | 5 | 0 | 1 | 0 | 182 | 84 | 41 | 173 | 5 | 611 | 0 | 0 | 0 | 0 | 0 |
| | 1:00 PM | 85 | 5 | 41 | 3 | 2 | 0 | 1 | 197 | 64 | 23 | 135 | 1 | 557 | 0 | 0 | 1 | 0 | 1 |
| | 1:15 PM | 75 | 2 | 33 | 5 | 11 | 0 | 0 | 165 | 75 | 36 | 120 | 3 | 525 | 0 | 0 | 0 | 0 | 0 |
| | 1:30 PM | 73 | 3 | 36 | 1 | 6 | 1 | 0 | 163 | 77 | 41 | 119 | 1 | 521 | 0 | 0 | 0 | 0 | 0 |
| | 1:45 PM | 65 | 6 | 49 | 4 | 0 | 2 | 3 | 190 | 72 | 41 | 145 | 4 | 581 | 0 | 0 | 1 | 0 | 1 |
| | 2:00 PM | 57 | 4 | 32 | 1 | 3 | 4 | 1 | 145 | 70 | 17 | 123 | 2 | 459 | 0 | 0 | 0 | 0 | 0 |
| | 2:15 PM | 75 | 1 | 39 | 2 | 6 | 2 | 2 | 169 | 46 | 35 | 121 | 3 | 501 | 0 | 0 | 1 | 0 | 1 |
| | 2:30 PM | 64 | 0 | 39 | 4 | 8 | 3 | 2 | 158 | 58 | 29 | 129 | 1 | 495 | 0 | 0 | 1 | 0 | 1 |
| | 2:45 PM | 65 | 6 | 31 | 2 | 2 | 0 | 2 | 165 | 60 | 36 | 154 | 2 | 525 | 0 | 0 | 0 | 0 | 0 |
| | VOLUMES | 1,137 | 58 | 582 | 52 | 81 | 41 | 24 | 2,539 | 1,072 | 537 | 2,300 | 44 | 8,467 | 2 | 0 | 9 | 0 | 11 |
| | APPROACH % | 64% | 3% | 33% | 30% | 47% | 24% | 1% | 70% | 29% | 19% | 80% | 2% | | | | | | |
| | APP/DEPART | 1,777 | / | 117 | 174 | / | 1,692 | 3,635 | / | 3,173 | 2,881 | / | 3,485 | 0 | | | | | |
| | BEGIN PEAK HR | | 12:00 PM | | | | | | | | | | | | | | | | |
| | VOLUMES | 303 | 18 | 159 | 11 | 20 | 12 | 8 | 669 | 318 | 145 | 654 | 12 | 2,329 | | | | | |
| | APPROACH % | 63% | 4% | 33% | 26% | 47% | 28% | 1% | 67% | 32% | 18% | 81% | 1% | | | | | | |
| | PEAK HR FACTOR | | 0.960 | | | 0.717 | | | 0.935 | | | 0.926 | | 0.953 | | | | | |
| | APP/DEPART | 480 | / | 35 | 43 | / | 485 | 995 | / | 839 | 811 | / | 970 | 0 | | | | | |

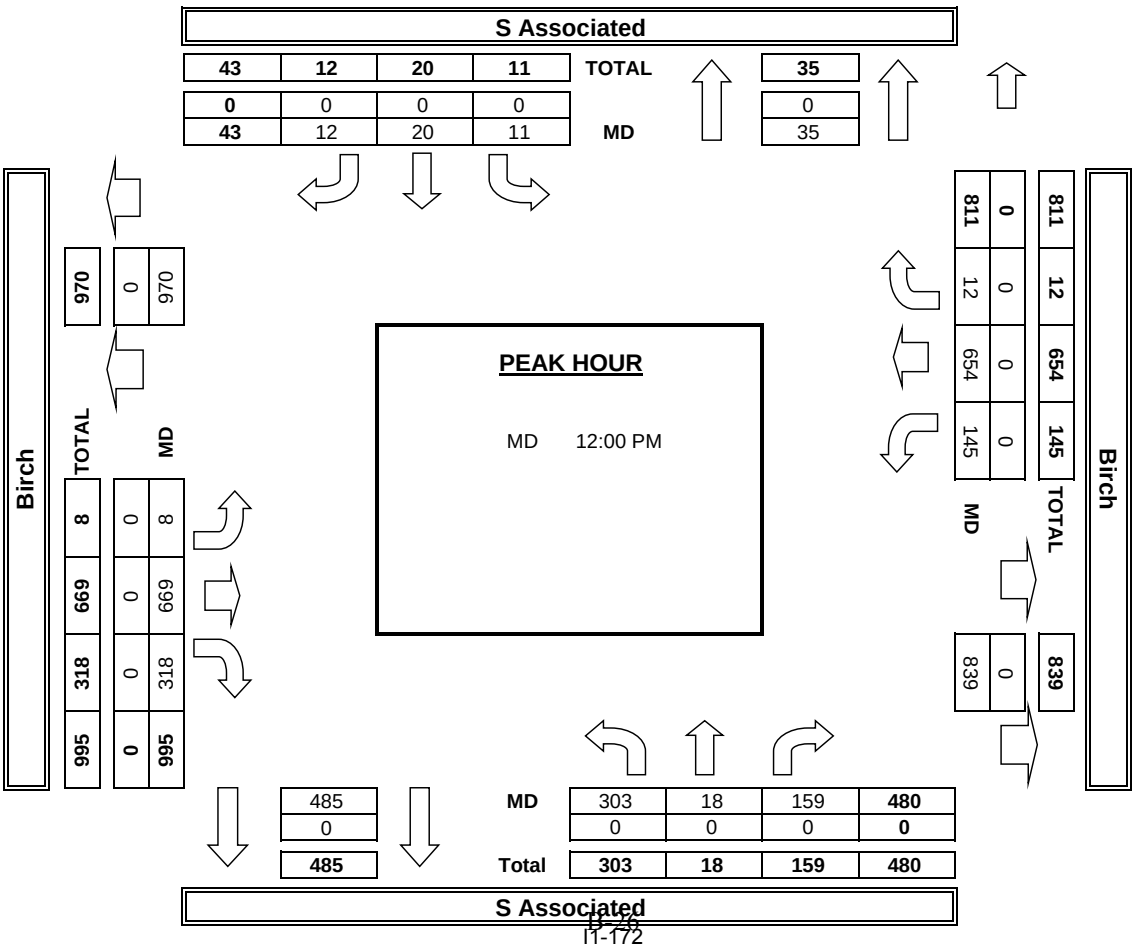



| | | PEDESTRIAN + BIKE CROSSINGS | | | | | PEDESTRIAN CROSSINGS | | | | | BICYCLE CROSSINGS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | NS | SS | ES | WS | TOTAL |
| MD | 11:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 11:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 11:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 11:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | AM BEGIN PEAK HR | 12:00 PM | | | | | 0 | 0 | 0 | 0 | 0 | | | | | |

**AimTD LLC**

TURNING MOVEMENT COUNTS



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** S Randolph Ave & Madison Way
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01152-001
**Date:** 8/6/2019

**Total**

| NS/EW Streets: | S Randolph Ave | | | | S Randolph Ave | | | | Madison Way | | | | Madison Way | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 1 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 7:00 AM | 1 | 21 | 0 | 0 | 1 | 22 | 1 | 0 | 5 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 58 |
| 7:15 AM | 1 | 26 | 2 | 0 | 1 | 34 | 1 | 0 | 5 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 87 |
| 7:30 AM | 6 | 28 | 1 | 0 | 1 | 22 | 5 | 0 | 5 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 87 |
| 7:45 AM | 11 | 29 | 3 | 0 | 1 | 22 | 0 | 0 | 11 | 2 | 23 | 0 | 0 | 0 | 0 | 0 | 102 |
| 8:00 AM | 5 | 29 | 3 | 0 | 3 | 24 | 2 | 0 | 7 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 82 |
| 8:15 AM | 2 | 37 | 1 | 0 | 1 | 43 | 6 | 0 | 7 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 100 |
| 8:30 AM | 4 | 15 | 3 | 0 | 0 | 29 | 2 | 0 | 4 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 71 |
| 8:45 AM | 10 | 30 | 2 | 0 | 0 | 31 | 5 | 0 | 8 | 1 | 11 | 0 | 0 | 0 | 0 | 0 | 98 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 40 | 215 | 15 | 0 | 8 | 227 | 22 | 0 | 52 | 3 | 103 | 0 | 0 | 0 | 0 | 0 | 685 |
| **APPROACH %'s :** | 14.81% | 79.63% | 5.56% | 0.00% | 3.11% | 88.33% | 8.56% | 0.00% | 32.91% | 1.90% | 65.19% | 0.00% | | | | | |
| **PEAK HR :** | 07:30 AM - 08:30 AM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 24 | 123 | 8 | 0 | 6 | 111 | 13 | 0 | 30 | 2 | 54 | 0 | 0 | 0 | 0 | 0 | 371 |
| **PEAK HR FACTOR :** | 0.545 | 0.831 | 0.667 | 0.000 | 0.500 | 0.645 | 0.542 | 0.000 | 0.682 | 0.250 | 0.587 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.909 |
| | 0.901 | | | | 0.650 | | | | 0.597 | | | | | | | | |

| PM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 4:00 PM | 14 | 66 | 11 | 0 | 7 | 45 | 3 | 0 | 10 | 1 | 8 | 0 | 16 | 2 | 17 | 0 | 200 |
| 4:15 PM | 8 | 66 | 9 | 0 | 10 | 42 | 8 | 0 | 9 | 1 | 6 | 0 | 18 | 1 | 18 | 0 | 196 |
| 4:30 PM | 10 | 67 | 10 | 0 | 8 | 44 | 6 | 0 | 8 | 1 | 7 | 0 | 11 | 0 | 18 | 0 | 190 |
| 4:45 PM | 5 | 67 | 10 | 0 | 1 | 57 | 3 | 2 | 5 | 0 | 10 | 0 | 12 | 2 | 9 | 0 | 183 |
| 5:00 PM | 7 | 76 | 14 | 0 | 5 | 61 | 7 | 0 | 11 | 1 | 10 | 0 | 19 | 0 | 12 | 0 | 223 |
| 5:15 PM | 6 | 77 | 11 | 0 | 8 | 53 | 4 | 0 | 11 | 1 | 14 | 0 | 19 | 2 | 6 | 0 | 212 |
| 5:30 PM | 15 | 63 | 9 | 0 | 7 | 58 | 6 | 0 | 22 | 1 | 16 | 0 | 20 | 2 | 8 | 0 | 227 |
| 5:45 PM | 16 | 72 | 5 | 0 | 6 | 56 | 9 | 0 | 13 | 1 | 8 | 0 | 11 | 0 | 9 | 0 | 206 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 81 | 554 | 79 | 0 | 52 | 416 | 46 | 2 | 89 | 7 | 79 | 0 | 126 | 9 | 97 | 0 | 1637 |
| **APPROACH %'s :** | 11.34% | 77.59% | 11.06% | 0.00% | 10.08% | 80.62% | 8.91% | 0.39% | 50.86% | 4.00% | 45.14% | 0.00% | 54.31% | 3.88% | 41.81% | 0.00% | |
| **PEAK HR :** | 05:00 PM - 06:00 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 44 | 288 | 39 | 0 | 26 | 228 | 26 | 0 | 57 | 4 | 48 | 0 | 69 | 4 | 35 | 0 | 868 |
| **PEAK HR FACTOR :** | 0.688 | 0.935 | 0.696 | 0.000 | 0.813 | 0.934 | 0.722 | 0.000 | 0.648 | 1.000 | 0.750 | 0.000 | 0.863 | 0.500 | 0.729 | 0.000 | 0.956 |
| | 0.956 | | | | 0.959 | | | | 0.699 | | | | 0.871 | | | | |

Prepared by National Data & Surveying Services

# S Randolph Ave & Madison Way

## Peak Hour Turning Movement Count

**ID:** 19-01152-001
**City:** Brea

**Day:** Tuesday
**Date:** 08/06/2019

| PEAK HOURS | COUNT PERIODS |
|---|---|
| 07:30 AM - 08:30 AM | 07:00 AM - 09:00 AM |
| NONE | NONE |
| 05:00 PM - 06:00 PM | 04:00 PM - 06:00 PM |

### S Randolph Ave — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 13 | 111 | 6 | 0 | 153 | AM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| PM | 26 | 228 | 26 | 0 | 380 | PM |
| | 0 | 2 | 1 | 0 | | |

### Madison Way — EASTBOUND

| AM | NOON | PM | |
|---|---|---|---|
| 37 | 0 | 74 | |
| 0 | 0 | 0 | 0 |
| 30 | 0 | 57 | 1 |
| 2 | 0 | 4 | 1 |
| 54 | 0 | 48 | 0 |
| AM | NOON | PM | |

### CONTROL

Signalized

| | | | |
|---|---|---|---|
| TEV | 371 AM | 0 NOON | 868 PM |
| PHF | 0.91 | | 0.96 |

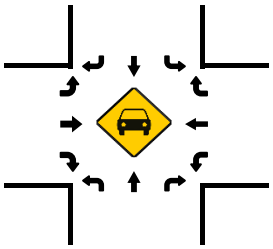
### Madison Way — WESTBOUND

| | PM | NOON | AM |
|---|---|---|---|
| 0 | 35 | 0 | 0 |
| 1 | 4 | 0 | 0 |
| 1 | 69 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| | 69 | 0 | 16 |
| | PM | NOON | AM |

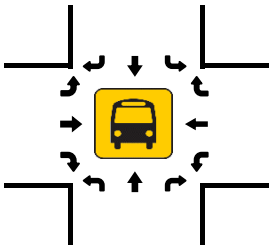
### S Randolph Ave — NORTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 0 | | |
| PM | 345 | 0 | 44 | 288 | 39 | PM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| AM | 165 | 0 | 24 | 123 | 8 | AM |

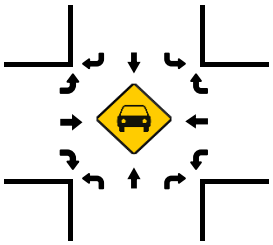
Total Vehicles (AM)



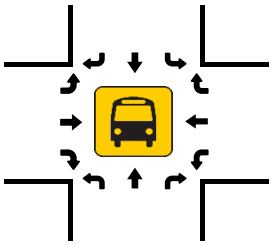
Total Vehicles (AM)



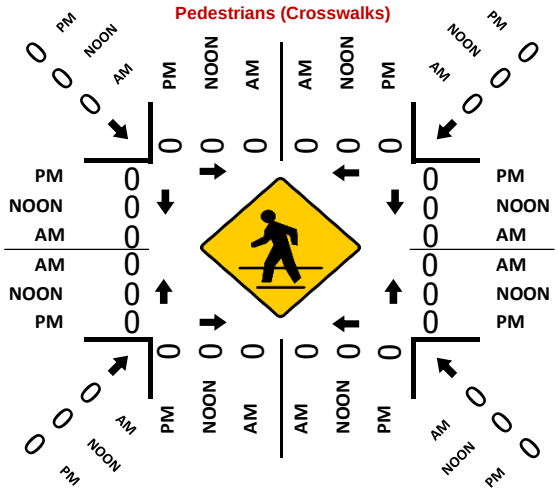
Total Vehicles (NOON)



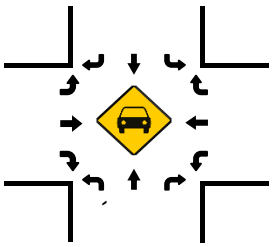
Total Vehicles (NOON)



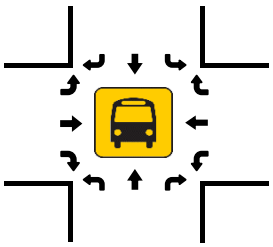
Pedestrians (Crosswalks)




Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** S Randolph Ave & Madison Way
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01152-001
**Date:** 8/3/2019

**Total**

| NS/EW Streets: | S Randolph Ave | | | | S Randolph Ave | | | | Madison Way | | | | Madison Way | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NOON** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 1 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 11:00 AM | 6 | 47 | 21 | 0 | 9 | 50 | 1 | 0 | 7 | 3 | 11 | 0 | 9 | 2 | 7 | 0 | 173 |
| 11:15 AM | 5 | 53 | 21 | 0 | 11 | 55 | 4 | 0 | 3 | 2 | 5 | 0 | 7 | 0 | 8 | 0 | 174 |
| 11:30 AM | 4 | 54 | 33 | 0 | 13 | 60 | 5 | 0 | 7 | 1 | 10 | 0 | 13 | 0 | 14 | 0 | 214 |
| 11:45 AM | 10 | 65 | 30 | 0 | 14 | 60 | 5 | 0 | 9 | 3 | 11 | 0 | 14 | 1 | 7 | 0 | 229 |
| 12:00 PM | 8 | 67 | 28 | 0 | 10 | 67 | 4 | 0 | 13 | 1 | 12 | 0 | 17 | 1 | 15 | 0 | 243 |
| 12:15 PM | 5 | 68 | 23 | 0 | 17 | 69 | 4 | 0 | 6 | 1 | 13 | 0 | 20 | 1 | 11 | 0 | 238 |
| 12:30 PM | 4 | 63 | 30 | 0 | 21 | 51 | 6 | 0 | 1 | 3 | 9 | 0 | 20 | 0 | 13 | 0 | 221 |
| 12:45 PM | 3 | 55 | 25 | 0 | 18 | 53 | 5 | 0 | 12 | 5 | 21 | 0 | 19 | 2 | 15 | 0 | 233 |
| 1:00 PM | 5 | 48 | 37 | 0 | 11 | 54 | 6 | 0 | 6 | 3 | 14 | 0 | 28 | 1 | 10 | 0 | 223 |
| 1:15 PM | 2 | 69 | 27 | 0 | 13 | 47 | 4 | 0 | 3 | 0 | 5 | 0 | 20 | 4 | 21 | 0 | 215 |
| 1:30 PM | 3 | 70 | 24 | 0 | 17 | 52 | 3 | 0 | 4 | 2 | 5 | 0 | 20 | 1 | 17 | 0 | 218 |
| 1:45 PM | 1 | 74 | 36 | 0 | 14 | 45 | 1 | 0 | 12 | 3 | 16 | 0 | 22 | 0 | 19 | 0 | 243 |
| 2:00 PM | 1 | 53 | 33 | 1 | 14 | 51 | 5 | 0 | 9 | 2 | 15 | 0 | 19 | 2 | 15 | 0 | 220 |
| 2:15 PM | 4 | 53 | 27 | 0 | 12 | 39 | 4 | 1 | 4 | 3 | 11 | 0 | 27 | 0 | 20 | 0 | 205 |
| 2:30 PM | 2 | 51 | 19 | 0 | 16 | 52 | 4 | 0 | 5 | 1 | 5 | 0 | 26 | 2 | 20 | 0 | 203 |
| 2:45 PM | 5 | 64 | 30 | 0 | 9 | 63 | 6 | 0 | 2 | 1 | 6 | 0 | 17 | 1 | 18 | 0 | 222 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 68 | 954 | 444 | 1 | 219 | 868 | 67 | 1 | 103 | 34 | 169 | 0 | 298 | 18 | 230 | 0 | 3474 |
| **APPROACH %'s :** | 4.64% | 65.03% | 30.27% | 0.07% | 18.96% | 75.15% | 5.80% | 0.09% | 33.66% | 11.11% | 55.23% | 0.00% | 54.58% | 3.30% | 42.12% | 0.00% | |
| **PEAK HR :** | 12:00 PM - 01:00 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 20 | 253 | 106 | 0 | 66 | 240 | 19 | 0 | 32 | 10 | 55 | 0 | 76 | 4 | 54 | 0 | 935 |
| **PEAK HR FACTOR :** | 0.625 | 0.930 | 0.883 | 0.000 | 0.786 | 0.870 | 0.792 | 0.000 | 0.615 | 0.500 | 0.655 | 0.000 | 0.950 | 0.500 | 0.900 | 0.000 | 0.962 |
| | | 0.920 | | | | 0.903 | | | | 0.638 | | | | 0.931 | | | |

Prepared by National Data & Surveying Services

# S Randolph Ave & Madison Way

## Peak Hour Turning Movement Count

**ID:** 19-01152-001
**City:** Brea

**Day:** Saturday
**Date:** 08/03/2019

| PEAK HOURS | COUNT PERIODS |
|---|---|
| NONE | NONE |
| 12:00 PM - 01:00 PM | 11:00 AM - 03:00 PM |
| NONE | NONE |

### SOUTHBOUND (S Randolph Ave)

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 0 | 0 | 0 | 0 | 0 | AM |
| NOON | 19 | 240 | 66 | 0 | 339 | NOON |
| PM | 0 | 0 | 0 | 0 | 0 | PM |
| | 0 | 2 | 1 | 0 | | |

### EASTBOUND (Madison Way)

| AM | NOON | PM | |
|---|---|---|---|
| 0 | 43 | 0 | |
| 0 | 0 | 0 | 0 |
| 0 | 32 | 0 | 1 |
| 0 | 10 | 0 | 1 |
| 0 | 55 | 0 | 0 |
| AM | NOON | PM | |

### WESTBOUND (Madison Way)

| | PM | NOON | AM |
|---|---|---|---|
| 0 | 0 | 54 | 0 |
| 1 | 0 | 4 | 0 |
| 1 | 0 | 76 | 0 |
| 0 | 0 | 0 | 0 |
| | 0 | 182 | 0 |
| | PM | NOON | AM |

### CONTROL

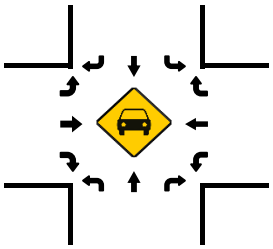
Signalized

| | AM | NOON | PM |
|---|---|---|---|
| TEV | 0 | 935 | 0 |
| PHF | | 0.96 | |

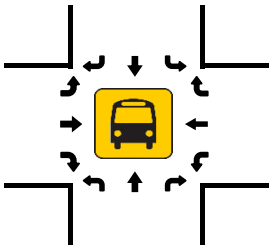
### NORTHBOUND (S Randolph Ave)

| | | | | | | |
|---|---|---|---|---|---|---|
| PM | 0 | 0 | 0 | 0 | 0 | PM |
| NOON | 371 | 0 | 20 | 253 | 106 | NOON |
| AM | 0 | 0 | 0 | 0 | 0 | AM |
| | | 0 | 1 | 2 | 0 | |

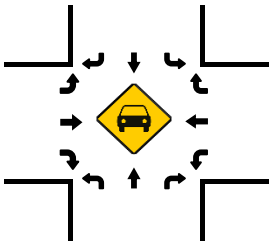
Total Vehicles (AM)



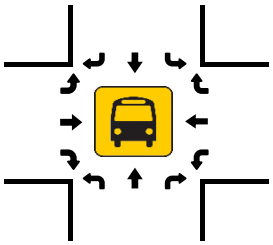
Total Vehicles (AM)



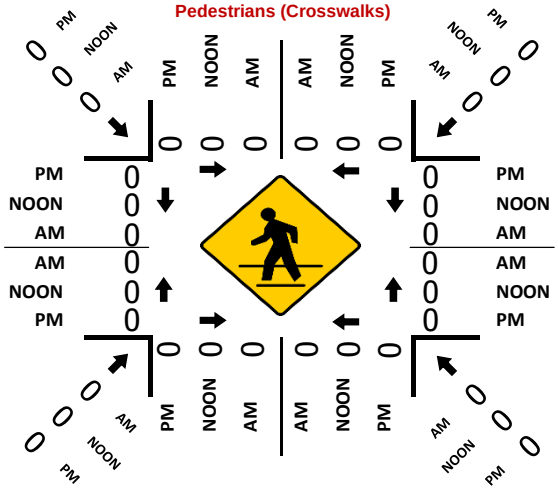
Total Vehicles (NOON)



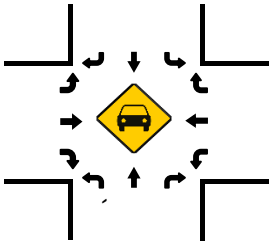
Total Vehicles (NOON)



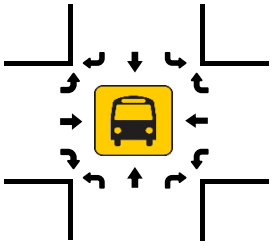
Pedestrians (Crosswalks)




Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** S Randolph Ave & T Brea Mall Dr
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01152-002
**Date:** 8/6/2019

**Total**

| NS/EW Streets: | S Randolph Ave | | | | S Randolph Ave | | | | T Brea Mall Dr | | | | T Brea Mall Dr | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 1 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 1.3 | 0.3 | 0.3 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 7:00 AM | 0 | 23 | 14 | 0 | 1 | 25 | 3 | 0 | 0 | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 71 |
| 7:15 AM | 0 | 28 | 7 | 0 | 0 | 46 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 83 |
| 7:30 AM | 0 | 35 | 11 | 0 | 1 | 37 | 3 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 91 |
| 7:45 AM | 2 | 45 | 12 | 0 | 2 | 40 | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 107 |
| 8:00 AM | 3 | 43 | 4 | 0 | 4 | 25 | 2 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 84 |
| 8:15 AM | 1 | 42 | 15 | 0 | 0 | 36 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 100 |
| 8:30 AM | 2 | 29 | 16 | 0 | 3 | 38 | 1 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 97 |
| 8:45 AM | 6 | 42 | 19 | 0 | 5 | 35 | 0 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 2 | 0 | 119 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 14 | 287 | 98 | 0 | 16 | 282 | 13 | 0 | 4 | 2 | 5 | 0 | 26 | 0 | 5 | 0 | 752 |
| **APPROACH %'s :** | 3.51% | 71.93% | 24.56% | 0.00% | 5.14% | 90.68% | 4.18% | 0.00% | 36.36% | 18.18% | 45.45% | 0.00% | 83.87% | 0.00% | 16.13% | 0.00% | |
| **PEAK HR :** | 08:00 AM - 09:00 AM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 12 | 156 | 54 | 0 | 12 | 134 | 6 | 0 | 1 | 0 | 1 | 0 | 20 | 0 | 4 | 0 | 400 |
| **PEAK HR FACTOR :** | 0.500 | 0.907 | 0.711 | 0.000 | 0.600 | 0.882 | 0.500 | 0.000 | 0.250 | 0.000 | 0.250 | 0.000 | 0.625 | 0.000 | 0.500 | 0.000 | 0.840 |
| | 0.828 | | | | 0.905 | | | | 0.250 | | | | 0.600 | | | | |

| PM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 1.3 | 0.3 | 0.3 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 4:00 PM | 0 | 77 | 41 | 0 | 6 | 63 | 4 | 0 | 2 | 0 | 1 | 0 | 67 | 1 | 13 | 0 | 275 |
| 4:15 PM | 7 | 67 | 63 | 0 | 3 | 56 | 1 | 0 | 3 | 1 | 1 | 0 | 45 | 0 | 15 | 0 | 262 |
| 4:30 PM | 1 | 73 | 45 | 0 | 3 | 53 | 6 | 0 | 1 | 2 | 4 | 0 | 53 | 0 | 12 | 0 | 253 |
| 4:45 PM | 3 | 64 | 76 | 0 | 8 | 75 | 4 | 0 | 4 | 2 | 2 | 0 | 55 | 1 | 8 | 0 | 302 |
| 5:00 PM | 5 | 81 | 55 | 0 | 7 | 85 | 6 | 0 | 4 | 1 | 1 | 0 | 52 | 0 | 9 | 0 | 306 |
| 5:15 PM | 1 | 82 | 70 | 0 | 5 | 83 | 2 | 0 | 3 | 0 | 5 | 0 | 53 | 0 | 8 | 0 | 312 |
| 5:30 PM | 6 | 75 | 67 | 0 | 9 | 86 | 6 | 0 | 5 | 0 | 3 | 0 | 64 | 2 | 10 | 0 | 333 |
| 5:45 PM | 4 | 75 | 66 | 0 | 4 | 65 | 2 | 0 | 1 | 0 | 7 | 0 | 42 | 1 | 14 | 0 | 281 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 27 | 594 | 483 | 0 | 45 | 566 | 31 | 0 | 23 | 6 | 24 | 0 | 431 | 5 | 89 | 0 | 2324 |
| **APPROACH %'s :** | 2.45% | 53.80% | 43.75% | 0.00% | 7.01% | 88.16% | 4.83% | 0.00% | 43.40% | 11.32% | 45.28% | 0.00% | 82.10% | 0.95% | 16.95% | 0.00% | |
| **PEAK HR :** | 04:45 PM - 05:45 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 15 | 302 | 268 | 0 | 29 | 329 | 18 | 0 | 16 | 3 | 11 | 0 | 224 | 3 | 35 | 0 | 1253 |
| **PEAK HR FACTOR :** | 0.625 | 0.921 | 0.882 | 0.000 | 0.806 | 0.956 | 0.750 | 0.000 | 0.800 | 0.375 | 0.550 | 0.000 | 0.875 | 0.375 | 0.875 | 0.000 | 0.941 |
| | 0.956 | | | | 0.931 | | | | 0.938 | | | | 0.862 | | | | |

Prepared by National Data & Surveying Services

# S Randolph Ave & T Brea Mall Dr

## Peak Hour Turning Movement Count

**ID:** 19-01152-002
**City:** Brea

**Day:** Tuesday
**Date:** 08/06/2019

| PEAK HOURS | |
|---|---|
| AM | 08:00 AM - 09:00 AM |
| NOON | NONE |
| PM | 04:45 PM - 05:45 PM |

| COUNT PERIODS | |
|---|---|
| AM | 07:00 AM - 09:00 AM |
| NOON | NONE |
| PM | 04:00 PM - 06:00 PM |

### S Randolph Ave — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 6 | 134 | 12 | 0 | 161 | AM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| PM | 18 | 329 | 29 | 0 | 353 | PM |

### T Brea Mall Dr — EASTBOUND

| AM | NOON | PM | | |
|---|---|---|---|---|
| 18 | 0 | 36 | | |
| 0 | 0 | 0 | 0 | |
| 1 | 0 | 16 | 0 | |
| 0 | 0 | 3 | 1 | |
| 1 | 0 | 11 | 0 | |
| AM | NOON | PM | | |

### T Brea Mall Dr — WESTBOUND

| PM | NOON | AM | |
|---|---|---|---|
| 35 | 0 | 4 | 0.3 |
| 3 | 0 | 0 | 0.3 |
| 224 | 0 | 20 | 1.3 |
| 0 | 0 | 0 | 0 |
| 300 | 0 | 66 | |
| PM | NOON | AM | |

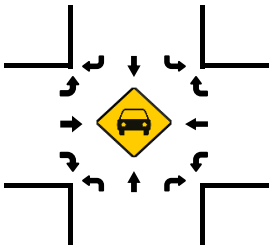
### S Randolph Ave — NORTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| PM | 564 | 0 | 15 | 302 | 268 | PM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| AM | 155 | 0 | 12 | 156 | 54 | AM |

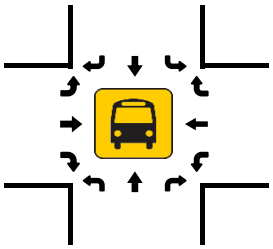
| | | | | |
|---|---|---|---|---|
| | 0 | 2 | 1 | 0 |
| | 0 | 1 | 2 | 0 |

| CONTROL | | | |
|---|---|---|---|
| Signalized | | | |
| TEV | 400 | 0 | 1253 |
| | AM | NOON | PM |
| PHF | 0.84 | | 0.94 |

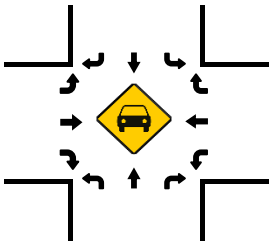
Total Vehicles (AM)



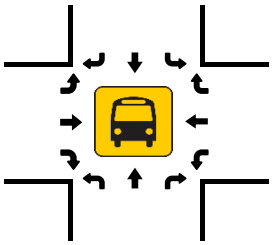
Total Vehicles (AM)



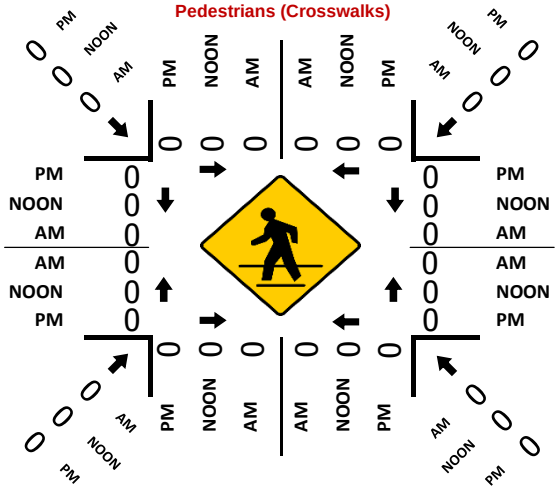
Total Vehicles (NOON)



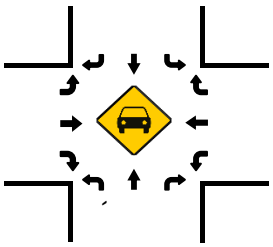
Total Vehicles (NOON)



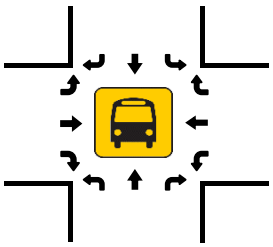
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** S Randolph Ave & T Brea Mall Dr
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01152-002
**Date:** 8/3/2019

**Total**

| NS/EW Streets: | S Randolph Ave | | | | S Randolph Ave | | | | T Brea Mall Dr | | | | T Brea Mall Dr | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NOON** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 1 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 1.3 | 0.3 | 0.3 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 11:00 AM | 11 | 61 | 71 | 0 | 4 | 60 | 6 | 0 | 5 | 1 | 3 | 0 | 42 | 0 | 7 | 0 | 271 |
| 11:15 AM | 8 | 67 | 67 | 0 | 6 | 56 | 9 | 0 | 4 | 3 | 4 | 0 | 36 | 0 | 10 | 1 | 271 |
| 11:30 AM | 16 | 78 | 84 | 1 | 8 | 66 | 7 | 0 | 8 | 1 | 6 | 0 | 43 | 0 | 10 | 0 | 328 |
| 11:45 AM | 5 | 88 | 84 | 1 | 9 | 75 | 3 | 0 | 9 | 3 | 9 | 0 | 46 | 2 | 9 | 1 | 344 |
| 12:00 PM | 7 | 90 | 80 | 0 | 13 | 78 | 6 | 0 | 4 | 3 | 6 | 0 | 50 | 0 | 12 | 0 | 349 |
| 12:15 PM | 9 | 84 | 69 | 0 | 14 | 76 | 12 | 0 | 4 | 6 | 4 | 0 | 40 | 0 | 11 | 0 | 329 |
| 12:30 PM | 3 | 82 | 97 | 1 | 6 | 76 | 4 | 0 | 7 | 3 | 7 | 0 | 62 | 4 | 11 | 0 | 363 |
| 12:45 PM | 5 | 64 | 97 | 0 | 13 | 78 | 3 | 0 | 5 | 1 | 2 | 0 | 71 | 0 | 12 | 0 | 351 |
| 1:00 PM | 6 | 74 | 88 | 0 | 17 | 76 | 4 | 0 | 6 | 4 | 7 | 0 | 80 | 2 | 12 | 0 | 376 |
| 1:15 PM | 6 | 78 | 86 | 0 | 4 | 67 | 5 | 0 | 6 | 5 | 4 | 0 | 73 | 3 | 13 | 0 | 350 |
| 1:30 PM | 1 | 83 | 86 | 0 | 6 | 64 | 1 | 0 | 5 | 2 | 6 | 0 | 84 | 0 | 13 | 0 | 351 |
| 1:45 PM | 7 | 78 | 94 | 1 | 4 | 72 | 10 | 0 | 6 | 2 | 8 | 0 | 90 | 1 | 22 | 0 | 395 |
| 2:00 PM | 8 | 73 | 77 | 0 | 8 | 75 | 5 | 0 | 5 | 1 | 4 | 0 | 80 | 1 | 13 | 0 | 350 |
| 2:15 PM | 3 | 65 | 69 | 0 | 9 | 56 | 8 | 0 | 2 | 3 | 2 | 0 | 84 | 2 | 15 | 0 | 318 |
| 2:30 PM | 11 | 66 | 66 | 0 | 11 | 72 | 6 | 0 | 4 | 2 | 3 | 0 | 86 | 0 | 5 | 0 | 332 |
| 2:45 PM | 12 | 74 | 79 | 0 | 10 | 69 | 7 | 0 | 4 | 1 | 5 | 0 | 77 | 4 | 25 | 0 | 367 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 118 | 1205 | 1294 | 4 | 142 | 1116 | 96 | 0 | 84 | 41 | 80 | 0 | 1044 | 19 | 200 | 2 | 5445 |
| **APPROACH %'s :** | 4.50% | 45.97% | 49.37% | 0.15% | 10.49% | 82.42% | 7.09% | 0.00% | 40.98% | 20.00% | 39.02% | 0.00% | 82.53% | 1.50% | 15.81% | 0.16% | |
| **PEAK HR :** | 01:00 PM - 02:00 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 20 | 313 | 354 | 1 | 31 | 279 | 20 | 0 | 23 | 13 | 25 | 0 | 327 | 6 | 60 | 0 | 1472 |
| **PEAK HR FACTOR :** | 0.714 | 0.943 | 0.941 | 0.250 | 0.456 | 0.918 | 0.500 | 0.000 | 0.958 | 0.650 | 0.781 | 0.000 | 0.908 | 0.500 | 0.682 | 0.000 | 0.932 |
| | | 0.956 | | | | 0.851 | | | | 0.897 | | | | 0.869 | | | |

Prepared by National Data & Surveying Services

# S Randolph Ave & T Brea Mall Dr

## Peak Hour Turning Movement Count

**ID:** 19-01152-002
**City:** Brea

**Day:** Saturday
**Date:** 08/03/2019

| PEAK HOURS | COUNT PERIODS |
|---|---|
| NONE | NONE |
| 01:00 PM - 02:00 PM | 11:00 AM - 03:00 PM |
| NONE | NONE |

### S Randolph Ave — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 0 | 0 | 0 | 0 | 0 | AM |
| NOON | 20 | 279 | 31 | 0 | 396 | NOON |
| PM | 0 | 0 | 0 | 0 | 0 | PM |

### T Brea Mall Dr — EASTBOUND

| AM | NOON | PM | |
|---|---|---|---|
| 0 | 46 | 0 | ⇦ |
| 0 | 0 | 0 | ↶ 0 |
| 0 | 23 | 0 | ↱ 0 |
| 0 | 13 | 0 | → 1 |
| 0 | 25 | 0 | ↴ 0 |
| AM | NOON | PM | |

### T Brea Mall Dr — WESTBOUND

| PM | NOON | AM | |
|---|---|---|---|
| 0 | 60 | 0 | 0.3 ↰ |
| 0 | 6 | 0 | 0.3 ← |
| 0 | 327 | 0 | 1.3 ↰ |
| 0 | 0 | 0 | 0 ↶ |
| 0 | 398 | 0 | ⇨ |
| PM | NOON | AM | |

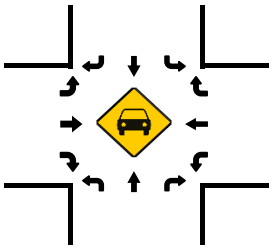
### S Randolph Ave — NORTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| PM | 0 | 0 | 0 | 0 | 0 | PM |
| NOON | 632 | 1 | 20 | 313 | 354 | NOON |
| AM | 0 | 0 | 0 | 0 | 0 | AM |

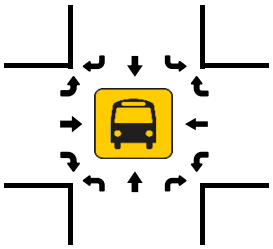
| | | | | |
|---|---|---|---|---|
| | 0 | 2 | 1 | 0 |
| | 0 | 1 | 2 | 0 |

| CONTROL | | | |
|---|---|---|---|
| Signalized | | | |
| TEV | 0 AM | 1472 NOON | 0 PM |
| PHF | | 0.93 | |

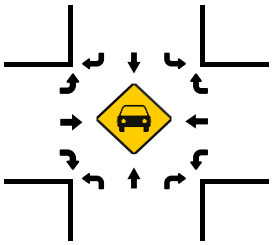
**Total Vehicles (AM)**



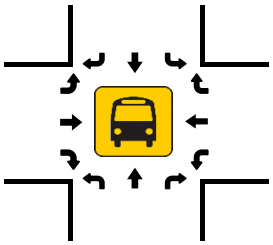
**Total Vehicles (AM)**



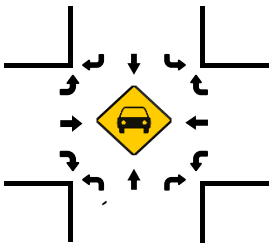
**Total Vehicles (NOON)**



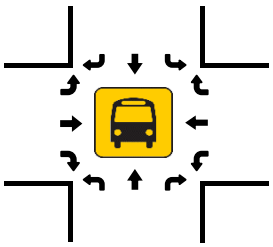
**Total Vehicles (NOON)**



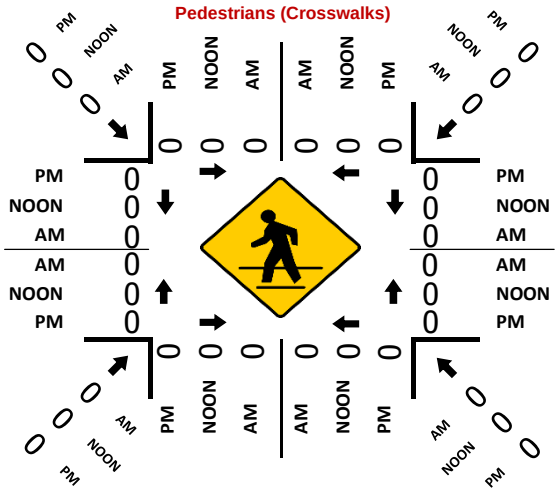
**Total Vehicles (PM)**



**Total Vehicles (PM)**



**Pedestrians (Crosswalks)**



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** Brea Mall S Dwy & S State College Blvd
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01152-003
**Date:** 8/6/2019

**Total**

| NS/EW Streets: | Brea Mall S Dwy | | | | Brea Mall S Dwy | | | | S State College Blvd | | | | S State College Blvd | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 1.5 | 0.5 | 1 | 0 | 0.5 | 1.5 | 1 | 0 | 2 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 7:00 AM | 4 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 4 | 35 | 0 | 1 | 3 | 80 | 1 | 0 | 132 |
| 7:15 AM | 6 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 10 | 35 | 0 | 0 | 6 | 109 | 0 | 0 | 169 |
| 7:30 AM | 9 | 0 | 5 | 0 | 0 | 0 | 4 | 0 | 6 | 51 | 1 | 0 | 3 | 74 | 0 | 0 | 153 |
| 7:45 AM | 5 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 10 | 69 | 0 | 1 | 1 | 95 | 1 | 0 | 183 |
| 8:00 AM | 8 | 0 | 0 | 0 | 1 | 0 | 9 | 0 | 14 | 58 | 1 | 0 | 4 | 68 | 1 | 0 | 164 |
| 8:15 AM | 5 | 1 | 3 | 0 | 0 | 0 | 2 | 0 | 10 | 58 | 4 | 0 | 5 | 81 | 2 | 0 | 171 |
| 8:30 AM | 6 | 2 | 3 | 0 | 1 | 1 | 5 | 0 | 16 | 43 | 5 | 0 | 9 | 76 | 3 | 0 | 170 |
| 8:45 AM | 11 | 2 | 8 | 0 | 0 | 1 | 2 | 0 | 18 | 69 | 4 | 0 | 8 | 79 | 3 | 0 | 205 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 54 | 5 | 26 | 0 | 2 | 2 | 23 | 0 | 88 | 418 | 15 | 2 | 39 | 662 | 11 | 0 | 1347 |
| **APPROACH %'s :** | 63.53% | 5.88% | 30.59% | 0.00% | 7.41% | 7.41% | 85.19% | 0.00% | 16.83% | 79.92% | 2.87% | 0.38% | 5.48% | 92.98% | 1.54% | 0.00% | |
| **PEAK HR :** | 08:00 AM - 09:00 AM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 30 | 5 | 14 | 0 | 2 | 2 | 18 | 0 | 58 | 228 | 14 | 0 | 26 | 304 | 9 | 0 | 710 |
| **PEAK HR FACTOR :** | 0.682 | 0.625 | 0.438 | 0.000 | 0.500 | 0.500 | 0.500 | 0.000 | 0.806 | 0.826 | 0.700 | 0.000 | 0.722 | 0.938 | 0.750 | 0.000 | 0.866 |
| | 0.583 | | | | 0.550 | | | | 0.824 | | | | 0.942 | | | | |

| PM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.5 | 0.5 | 1 | 0 | 0.5 | 1.5 | 1 | 0 | 2 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 4:00 PM | 23 | 0 | 15 | 0 | 6 | 3 | 65 | 0 | 77 | 90 | 4 | 2 | 19 | 84 | 0 | 2 | 390 |
| 4:15 PM | 35 | 1 | 24 | 0 | 5 | 2 | 76 | 0 | 79 | 90 | 5 | 0 | 18 | 107 | 6 | 1 | 449 |
| 4:30 PM | 26 | 7 | 18 | 0 | 9 | 4 | 78 | 0 | 80 | 105 | 3 | 1 | 16 | 106 | 5 | 0 | 458 |
| 4:45 PM | 33 | 1 | 24 | 0 | 10 | 4 | 60 | 0 | 96 | 99 | 1 | 1 | 17 | 89 | 4 | 2 | 441 |
| 5:00 PM | 35 | 3 | 14 | 0 | 9 | 4 | 82 | 0 | 94 | 100 | 5 | 0 | 25 | 96 | 3 | 0 | 470 |
| 5:15 PM | 36 | 3 | 16 | 0 | 3 | 3 | 68 | 0 | 88 | 126 | 7 | 0 | 21 | 112 | 5 | 0 | 488 |
| 5:30 PM | 36 | 7 | 20 | 0 | 7 | 3 | 74 | 0 | 96 | 117 | 4 | 3 | 21 | 94 | 3 | 0 | 485 |
| 5:45 PM | 24 | 5 | 11 | 0 | 9 | 2 | 78 | 0 | 121 | 131 | 5 | 1 | 23 | 92 | 7 | 0 | 509 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 248 | 27 | 142 | 0 | 58 | 25 | 581 | 0 | 731 | 858 | 34 | 8 | 160 | 780 | 33 | 5 | 3690 |
| **APPROACH %'s :** | 59.47% | 6.47% | 34.05% | 0.00% | 8.73% | 3.77% | 87.50% | 0.00% | 44.82% | 52.61% | 2.08% | 0.49% | 16.36% | 79.75% | 3.37% | 0.51% | |
| **PEAK HR :** | 05:00 PM - 06:00 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 131 | 18 | 61 | 0 | 28 | 12 | 302 | 0 | 399 | 474 | 21 | 4 | 90 | 394 | 18 | 0 | 1952 |
| **PEAK HR FACTOR :** | 0.910 | 0.643 | 0.763 | 0.000 | 0.778 | 0.750 | 0.921 | 0.000 | 0.824 | 0.905 | 0.750 | 0.333 | 0.900 | 0.879 | 0.643 | 0.000 | 0.959 |
| | 0.833 | | | | 0.900 | | | | 0.870 | | | | 0.909 | | | | |

Prepared by National Data & Surveying Services

# Brea Mall S Dwy & S State College Blvd

## Peak Hour Turning Movement Count

**ID:** 19-01152-003
**City:** Brea

**Day:** Tuesday
**Date:** 08/06/2019

| PEAK HOURS | COUNT PERIODS |
|---|---|
| 08:00 AM - 09:00 AM | 07:00 AM - 09:00 AM |
| NONE | NONE |
| 05:00 PM - 06:00 PM | 04:00 PM - 06:00 PM |

### Brea Mall S Dwy — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 18 | 2 | 2 | 0 | 72 | AM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| PM | 302 | 12 | 28 | 0 | 435 | PM |

### S State College Blvd — EASTBOUND

| AM | NOON | PM | |
|---|---|---|---|
| 352 | 0 | 831 | |
| 0 | 0 | 4 | 0 |
| 58 | 0 | 399 | 2 |
| 228 | 0 | 474 | 2 |
| 14 | 0 | 21 | 0 |

### CONTROL

Signalized

| | | | |
|---|---|---|---|
| TEV | 710 AM | 0 NOON | 1952 PM |
| PHF | 0.87 | | 0.96 |

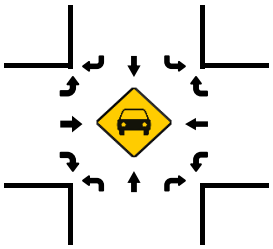
### S State College Blvd — WESTBOUND

| PM | NOON | AM | |
|---|---|---|---|
| 18 | 0 | 9 | 0 |
| 394 | 0 | 304 | 2 |
| 90 | 0 | 26 | 1 |
| 0 | 0 | 0 | 0 |
| 563 | 0 | 244 | |

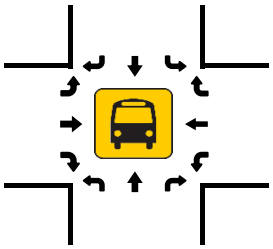
### Brea Mall S Dwy — NORTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| PM | 123 | 0 | 131 | 18 | 61 | PM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| AM | 42 | 0 | 30 | 5 | 14 | AM |

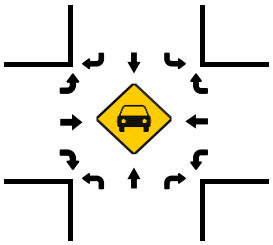
Total Vehicles (AM)



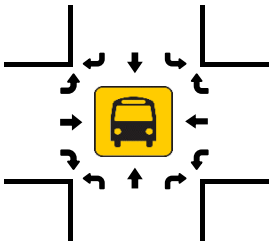
Total Vehicles (AM)



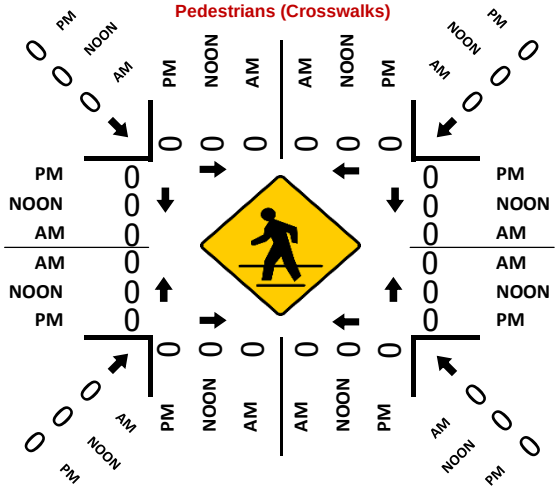
Total Vehicles (NOON)



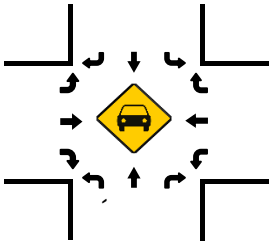
Total Vehicles (NOON)



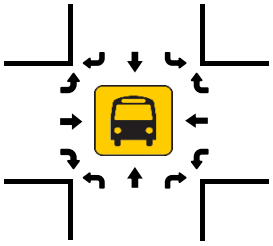
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** Brea Mall S Dwy & S State College Blvd
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01152-003
**Date:** 8/3/2019

**Total**

| NS/EW Streets: | Brea Mall S Dwy | | | | Brea Mall S Dwy | | | | S State College Blvd | | | | S State College Blvd | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NOON** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 1.5 | 0.5 | 1 | 0 | 0.5 | 1.5 | 1 | 0 | 2 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 11:00 AM | 30 | 5 | 22 | 0 | 4 | 7 | 51 | 1 | 107 | 92 | 10 | 1 | 25 | 81 | 6 | 0 | 442 |
| 11:15 AM | 30 | 6 | 9 | 0 | 5 | 1 | 46 | 1 | 110 | 80 | 4 | 2 | 17 | 87 | 6 | 0 | 404 |
| 11:30 AM | 34 | 5 | 18 | 0 | 3 | 7 | 65 | 0 | 126 | 80 | 5 | 1 | 31 | 84 | 7 | 0 | 466 |
| 11:45 AM | 37 | 6 | 18 | 0 | 4 | 4 | 63 | 0 | 148 | 96 | 11 | 1 | 25 | 87 | 5 | 0 | 505 |
| 12:00 PM | 37 | 10 | 22 | 0 | 4 | 8 | 60 | 0 | 137 | 96 | 11 | 0 | 24 | 112 | 9 | 0 | 530 |
| 12:15 PM | 59 | 9 | 17 | 0 | 4 | 4 | 76 | 0 | 109 | 88 | 15 | 1 | 25 | 113 | 7 | 1 | 528 |
| 12:30 PM | 35 | 12 | 21 | 0 | 8 | 6 | 70 | 0 | 143 | 92 | 6 | 1 | 23 | 143 | 6 | 0 | 566 |
| 12:45 PM | 42 | 9 | 26 | 0 | 8 | 4 | 92 | 0 | 122 | 80 | 6 | 1 | 27 | 98 | 6 | 1 | 522 |
| 1:00 PM | 44 | 9 | 20 | 0 | 9 | 3 | 84 | 0 | 133 | 79 | 7 | 0 | 20 | 125 | 6 | 0 | 539 |
| 1:15 PM | 33 | 6 | 15 | 0 | 3 | 4 | 83 | 0 | 115 | 97 | 6 | 0 | 18 | 100 | 5 | 0 | 485 |
| 1:30 PM | 37 | 6 | 24 | 0 | 11 | 5 | 95 | 0 | 133 | 79 | 11 | 1 | 19 | 138 | 6 | 0 | 565 |
| 1:45 PM | 54 | 8 | 19 | 0 | 15 | 7 | 110 | 0 | 148 | 90 | 4 | 0 | 16 | 115 | 7 | 1 | 594 |
| 2:00 PM | 38 | 8 | 21 | 0 | 9 | 7 | 93 | 0 | 134 | 87 | 9 | 0 | 24 | 124 | 2 | 0 | 556 |
| 2:15 PM | 38 | 2 | 16 | 0 | 8 | 3 | 123 | 0 | 136 | 84 | 5 | 4 | 19 | 161 | 5 | 1 | 605 |
| 2:30 PM | 30 | 5 | 30 | 0 | 9 | 1 | 96 | 0 | 124 | 79 | 10 | 0 | 20 | 156 | 7 | 1 | 568 |
| 2:45 PM | 43 | 2 | 9 | 0 | 12 | 4 | 99 | 0 | 128 | 85 | 3 | 1 | 21 | 119 | 8 | 0 | 534 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 621 | 108 | 307 | 0 | 116 | 75 | 1306 | 2 | 2053 | 1384 | 123 | 14 | 354 | 1843 | 98 | 5 | 8409 |
| **APPROACH %'s :** | 59.94% | 10.42% | 29.63% | 0.00% | 7.74% | 5.00% | 87.12% | 0.13% | 57.44% | 38.72% | 3.44% | 0.39% | 15.39% | 80.13% | 4.26% | 0.22% | |
| **PEAK HR :** | 01:45 PM - 02:45 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 160 | 23 | 86 | 0 | 41 | 18 | 422 | 0 | 542 | 340 | 28 | 4 | 79 | 556 | 21 | 3 | 2323 |
| **PEAK HR FACTOR :** | 0.741 | 0.719 | 0.717 | 0.000 | 0.683 | 0.643 | 0.858 | 0.000 | 0.916 | 0.944 | 0.700 | 0.250 | 0.823 | 0.863 | 0.750 | 0.750 | 0.960 |
| | | 0.830 | | | | 0.897 | | | | 0.944 | | | | 0.886 | | | |

Prepared by National Data & Surveying Services

# Brea Mall S Dwy & S State College Blvd

## Peak Hour Turning Movement Count

**ID:** 19-01152-003
**City:** Brea

**Day:** Saturday
**Date:** 08/03/2019

| PEAK HOURS | COUNT PERIODS |
|---|---|
| NONE | NONE |
| 01:45 PM - 02:45 PM | 11:00 AM - 03:00 PM |
| NONE | NONE |

### SOUTHBOUND — Brea Mall S Dwy

| | L | T | R | U | Total | |
|---|---|---|---|---|---|---|
| AM | 0 | 0 | 0 | 0 | 0 | AM |
| NOON | 422 | 18 | 41 | 0 | 586 | NOON |
| PM | 0 | 0 | 0 | 0 | 0 | PM |

### EASTBOUND — S State College Blvd

| AM | NOON | PM | |
|---|---|---|---|
| 0 | 1142 | 0 | |
| 0 | 4 | 0 | 0 |
| 0 | 542 | 0 | 2 |
| 0 | 340 | 0 | 2 |
| 0 | 28 | 0 | 0 |
| AM | NOON | PM | |

### WESTBOUND — S State College Blvd

| PM | NOON | AM | |
|---|---|---|---|
| 0 | 21 | 0 | 0 |
| 0 | 556 | 0 | 2 |
| 0 | 79 | 0 | 1 |
| 0 | 3 | 0 | 0 |
| 0 | 470 | 0 | |
| PM | NOON | AM | |

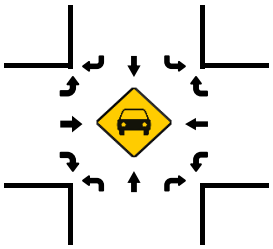
### NORTHBOUND — Brea Mall S Dwy

| | L | T | R | U | Total | |
|---|---|---|---|---|---|---|
| PM | 0 | 0 | 0 | 0 | 0 | PM |
| NOON | 125 | 0 | 160 | 23 | 86 | NOON |
| AM | 0 | 0 | 0 | 0 | 0 | AM |

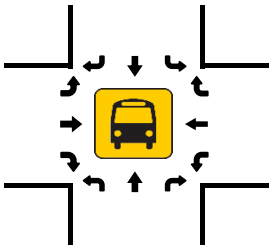
| | L | T | R | U |
|---|---|---|---|---|
| | 1 | 1.5 | 0.5 | 0 |
| | 0 | 1.5 | 0.5 | 1 |

| CONTROL | | | |
|---|---|---|---|
| Signalized | | | |
| TEV | 0 AM | 2323 NOON | 0 PM |
| PHF | | 0.96 | |

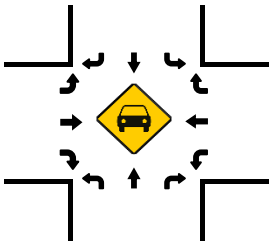
Total Vehicles (AM)



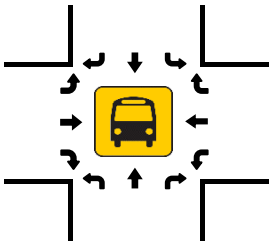
Total Vehicles (AM)



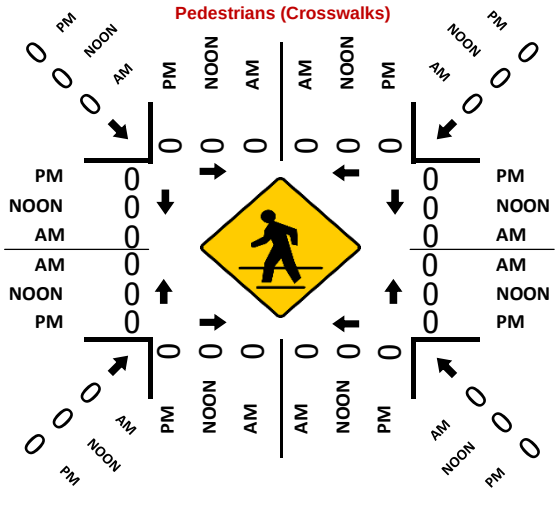
Total Vehicles (NOON)



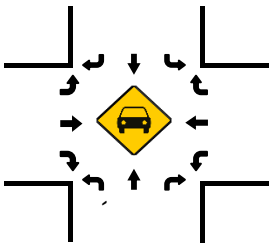
Total Vehicles (NOON)



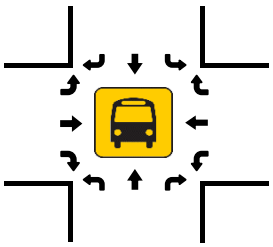
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** S Harbor Blvd & Imperial Hwy
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01101-010
**Date:** 5/22/2019

**Total**

| NS/EW Streets: | S Harbor Blvd | | | | S Harbor Blvd | | | | Imperial Hwy | | | | Imperial Hwy | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 2 | 3 | 1 | 0 | 2 | 3 | 1 | 0 | 2 | 3 | 0 | 0 | 2 | 3 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 7:00 AM | 61 | 148 | 49 | 0 | 37 | 293 | 56 | 0 | 34 | 277 | 79 | 0 | 52 | 273 | 22 | 4 | 1385 |
| 7:15 AM | 56 | 120 | 41 | 0 | 26 | 331 | 54 | 0 | 40 | 295 | 84 | 0 | 64 | 283 | 18 | 5 | 1417 |
| 7:30 AM | 76 | 145 | 72 | 0 | 31 | 300 | 65 | 0 | 49 | 352 | 103 | 3 | 62 | 271 | 25 | 11 | 1565 |
| 7:45 AM | 91 | 159 | 85 | 0 | 41 | 258 | 91 | 0 | 46 | 308 | 78 | 2 | 64 | 261 | 29 | 7 | 1520 |
| 8:00 AM | 69 | 163 | 49 | 0 | 43 | 234 | 72 | 0 | 50 | 273 | 80 | 1 | 61 | 262 | 21 | 6 | 1384 |
| 8:15 AM | 61 | 141 | 47 | 0 | 52 | 277 | 71 | 0 | 52 | 248 | 86 | 4 | 62 | 208 | 26 | 6 | 1341 |
| 8:30 AM | 75 | 130 | 38 | 0 | 34 | 259 | 49 | 0 | 43 | 251 | 82 | 0 | 64 | 222 | 23 | 8 | 1278 |
| 8:45 AM | 73 | 137 | 62 | 0 | 52 | 262 | 71 | 0 | 29 | 236 | 84 | 0 | 43 | 188 | 26 | 3 | 1266 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 562 | 1143 | 443 | 0 | 316 | 2214 | 529 | 0 | 343 | 2240 | 676 | 10 | 472 | 1968 | 190 | 50 | 11156 |
| **APPROACH %'s :** | 26.16% | 53.21% | 20.62% | 0.00% | 10.33% | 72.38% | 17.29% | 0.00% | 10.49% | 68.52% | 20.68% | 0.31% | 17.61% | 73.43% | 7.09% | 1.87% | |
| **PEAK HR :** | 07:00 AM - 08:00 AM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 284 | 572 | 247 | 0 | 135 | 1182 | 266 | 0 | 169 | 1232 | 344 | 5 | 242 | 1088 | 94 | 27 | 5887 |
| **PEAK HR FACTOR :** | 0.780 | 0.899 | 0.726 | 0.000 | 0.823 | 0.893 | 0.731 | 0.000 | 0.862 | 0.875 | 0.835 | 0.417 | 0.945 | 0.961 | 0.810 | 0.614 | 0.940 |
| | 0.823 | | | | 0.963 | | | | 0.863 | | | | 0.980 | | | | |

| **PM** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 1 | 0 | 2 | 3 | 1 | 0 | 2 | 3 | 0 | 0 | 2 | 3 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 4:00 PM | 76 | 248 | 50 | 0 | 36 | 183 | 31 | 0 | 65 | 270 | 69 | 0 | 94 | 341 | 54 | 5 | 1522 |
| 4:15 PM | 97 | 285 | 44 | 0 | 43 | 200 | 67 | 0 | 58 | 282 | 49 | 0 | 58 | 299 | 57 | 4 | 1543 |
| 4:30 PM | 102 | 253 | 59 | 0 | 29 | 217 | 50 | 0 | 70 | 259 | 75 | 3 | 111 | 347 | 56 | 5 | 1636 |
| 4:45 PM | 93 | 273 | 54 | 0 | 40 | 212 | 57 | 0 | 67 | 289 | 71 | 1 | 83 | 361 | 45 | 4 | 1650 |
| 5:00 PM | 92 | 266 | 48 | 0 | 48 | 201 | 76 | 0 | 60 | 266 | 72 | 0 | 89 | 352 | 63 | 4 | 1637 |
| 5:15 PM | 103 | 284 | 44 | 0 | 45 | 190 | 78 | 0 | 63 | 263 | 64 | 0 | 108 | 369 | 53 | 7 | 1671 |
| 5:30 PM | 118 | 216 | 55 | 0 | 52 | 208 | 80 | 0 | 61 | 307 | 66 | 3 | 102 | 337 | 45 | 8 | 1658 |
| 5:45 PM | 99 | 210 | 70 | 0 | 49 | 199 | 50 | 0 | 44 | 279 | 76 | 1 | 64 | 363 | 47 | 5 | 1556 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 780 | 2035 | 424 | 0 | 342 | 1610 | 489 | 0 | 488 | 2215 | 542 | 8 | 709 | 2769 | 420 | 42 | 12873 |
| **APPROACH %'s :** | 24.08% | 62.83% | 13.09% | 0.00% | 14.01% | 65.96% | 20.03% | 0.00% | 15.00% | 68.09% | 16.66% | 0.25% | 17.99% | 70.28% | 10.66% | 1.07% | |
| **PEAK HR :** | 04:45 PM - 05:45 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 406 | 1039 | 201 | 0 | 185 | 811 | 291 | 0 | 251 | 1125 | 273 | 4 | 382 | 1419 | 206 | 23 | 6616 |
| **PEAK HR FACTOR :** | 0.860 | 0.915 | 0.914 | 0.000 | 0.889 | 0.956 | 0.909 | 0.000 | 0.937 | 0.916 | 0.948 | 0.333 | 0.884 | 0.961 | 0.817 | 0.719 | 0.990 |
| | 0.955 | | | | 0.946 | | | | 0.946 | | | | 0.945 | | | | |

Prepared by National Data & Surveying Services

# S Harbor Blvd & Imperial Hwy

## Peak Hour Turning Movement Count

**ID:** 19-01101-010
**City:** Brea

**Day:** Wednesday
**Date:** 05/22/2019

**PEAK HOURS**

| | |
|---|---|
| AM | 07:00 AM - 08:00 AM |
| NOON | NONE |
| PM | 04:45 PM - 05:45 PM |

**COUNT PERIODS**

| | |
|---|---|
| AM | 07:00 AM - 09:00 AM |
| NOON | NONE |
| PM | 04:00 PM - 06:00 PM |

### S Harbor Blvd — SOUTHBOUND

| | 1 | 3 | 2 | 0 | |
|---|---|---|---|---|---|
| AM | 266 | 1182 | 135 | 0 | 835 |
| NOON | 0 | 0 | 0 | 0 | 0 |
| PM | 291 | 811 | 185 | 0 | 1496 |

### Imperial Hwy — EASTBOUND

| | AM | NOON | PM | |
|---|---|---|---|---|
| | 1643 | 0 | 2120 | |
| 0 | 5 | 0 | 4 | |
| 2 | 169 | 0 | 251 | |
| 3 | 1232 | 0 | 1125 | |
| 0 | 344 | 0 | 273 | |
| | AM | NOON | PM | |

### CONTROL

Signalized

| | | | |
|---|---|---|---|
| TEV | 5887 AM | 0 NOON | 6616 PM |
| PHF | 0.94 | | 0.99 |

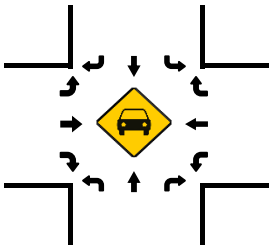
### Imperial Hwy — WESTBOUND

| | PM | NOON | AM | |
|---|---|---|---|---|
| 1 | 206 | 0 | 94 | |
| 3 | 1419 | 0 | 1088 | |
| 2 | 382 | 0 | 242 | |
| 0 | 23 | 0 | 27 | |
| | 1534 | 0 | 1641 | |
| | PM | NOON | AM | |

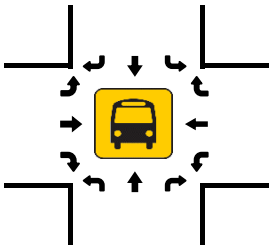
| | 0 | 2 | 3 | 1 | |
|---|---|---|---|---|---|
| PM | 1466 | 0 | 406 | 1039 | 201 |
| NOON | 0 | 0 | 0 | 0 | 0 |
| AM | 1768 | 0 | 284 | 572 | 247 |

### S Harbor Blvd — NORTHBOUND

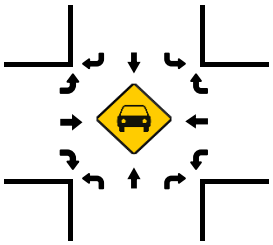
Total Vehicles (AM)



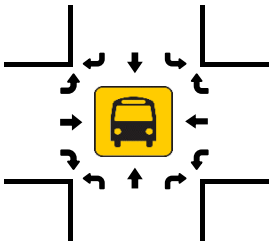
Total Vehicles (AM)



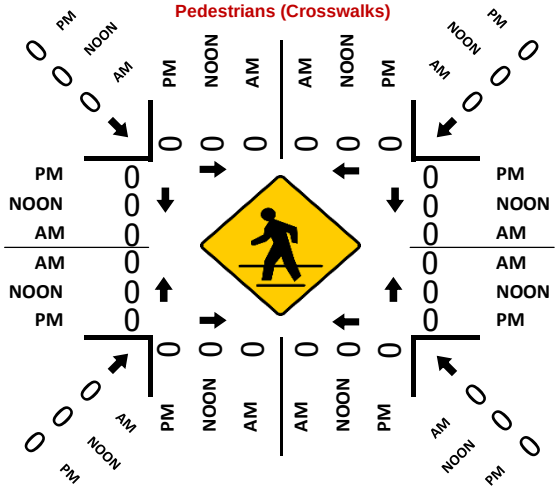
Total Vehicles (NOON)



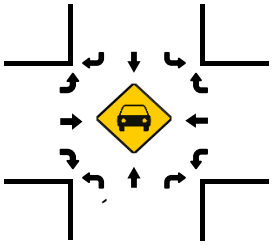
Total Vehicles (NOON)



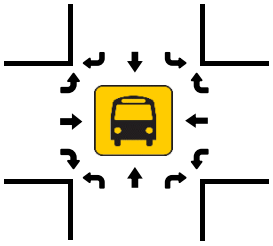
Pedestrians (Crosswalks)




Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** S Harbor Blvd & Imperial Hwy
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01101-010
**Date:** 5/18/2019

**Total**

| NS/EW Streets: | S Harbor Blvd | | | | S Harbor Blvd | | | | Imperial Hwy | | | | Imperial Hwy | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NOON** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 2 NL | 3 NT | 1 NR | 0 NU | 2 SL | 3 ST | 1 SR | 0 SU | 2 EL | 3 ET | 0 ER | 0 EU | 2 WL | 3 WT | 1 WR | 0 WU | TOTAL |
| 11:00 AM | 63 | 159 | 29 | 0 | 46 | 148 | 61 | 0 | 80 | 247 | 55 | 1 | 62 | 193 | 29 | 1 | 1174 |
| 11:15 AM | 96 | 133 | 57 | 0 | 40 | 146 | 66 | 0 | 64 | 250 | 70 | 5 | 76 | 187 | 36 | 9 | 1235 |
| 11:30 AM | 78 | 132 | 41 | 0 | 52 | 179 | 60 | 0 | 58 | 223 | 60 | 3 | 43 | 192 | 39 | 6 | 1166 |
| 11:45 AM | 74 | 154 | 50 | 0 | 49 | 170 | 63 | 1 | 68 | 271 | 63 | 1 | 62 | 220 | 46 | 9 | 1301 |
| 12:00 PM | 72 | 173 | 53 | 1 | 46 | 176 | 66 | 0 | 81 | 259 | 66 | 6 | 71 | 288 | 49 | 17 | 1424 |
| 12:15 PM | 83 | 193 | 55 | 7 | 52 | 170 | 72 | 0 | 72 | 251 | 68 | 2 | 67 | 296 | 31 | 18 | 1437 |
| 12:30 PM | 87 | 162 | 42 | 0 | 47 | 205 | 57 | 0 | 68 | 278 | 64 | 1 | 80 | 287 | 38 | 3 | 1419 |
| 12:45 PM | 77 | 182 | 39 | 0 | 51 | 187 | 62 | 0 | 68 | 253 | 61 | 2 | 67 | 268 | 46 | 6 | 1369 |
| 1:00 PM | 85 | 181 | 43 | 1 | 47 | 184 | 55 | 0 | 59 | 225 | 51 | 2 | 62 | 227 | 43 | 9 | 1274 |
| 1:15 PM | 60 | 150 | 55 | 0 | 47 | 220 | 48 | 1 | 66 | 266 | 55 | 2 | 59 | 239 | 42 | 6 | 1316 |
| 1:30 PM | 74 | 146 | 33 | 0 | 51 | 207 | 66 | 2 | 68 | 223 | 58 | 3 | 79 | 247 | 41 | 8 | 1306 |
| 1:45 PM | 76 | 160 | 45 | 0 | 45 | 187 | 75 | 0 | 75 | 240 | 65 | 1 | 76 | 285 | 50 | 3 | 1383 |
| 2:00 PM | 61 | 169 | 34 | 1 | 49 | 206 | 57 | 0 | 72 | 254 | 55 | 1 | 52 | 258 | 39 | 7 | 1315 |
| 2:15 PM | 77 | 175 | 49 | 0 | 45 | 177 | 52 | 1 | 65 | 221 | 71 | 1 | 60 | 262 | 48 | 6 | 1310 |
| 2:30 PM | 79 | 181 | 46 | 0 | 47 | 217 | 51 | 0 | 65 | 253 | 67 | 0 | 50 | 267 | 35 | 6 | 1364 |
| 2:45 PM | 71 | 152 | 42 | 0 | 53 | 174 | 56 | 0 | 46 | 231 | 62 | 3 | 49 | 314 | 37 | 8 | 1298 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 1213 | 2602 | 713 | 10 | 767 | 2953 | 967 | 5 | 1075 | 3945 | 991 | 34 | 1015 | 4030 | 649 | 122 | 21091 |
| **APPROACH %'s :** | 26.73% | 57.34% | 15.71% | 0.22% | 16.35% | 62.94% | 20.61% | 0.11% | 17.78% | 65.26% | 16.39% | 0.56% | 17.45% | 69.29% | 11.16% | 2.10% | |
| **PEAK HR :** | 12:00 PM - 01:00 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 319 | 710 | 189 | 8 | 196 | 738 | 257 | 0 | 289 | 1041 | 259 | 11 | 285 | 1139 | 164 | 44 | 5649 |
| **PEAK HR FACTOR :** | 0.917 | 0.920 | 0.859 | 0.286 | 0.942 | 0.900 | 0.892 | 0.000 | 0.892 | 0.936 | 0.952 | 0.458 | 0.891 | 0.962 | 0.837 | 0.611 | 0.983 |
| | 0.907 | | | | 0.964 | | | | 0.971 | | | | 0.960 | | | | |

Prepared by National Data & Surveying Services

# S Harbor Blvd & Imperial Hwy

## Peak Hour Turning Movement Count

**ID:** 19-01101-010
**City:** Brea

**Day:** Saturday
**Date:** 05/18/2019

**PEAK HOURS**

| | |
|---|---|
| AM | NONE |
| NOON | 12:00 PM - 01:00 PM |
| PM | NONE |

**COUNT PERIODS**

| | |
|---|---|
| AM | NONE |
| NOON | 11:00 AM - 03:00 PM |
| PM | NONE |

### S Harbor Blvd — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 0 | 0 | 0 | 0 | 0 | AM |
| NOON | 257 | 738 | 196 | 0 | 1163 | NOON |
| PM | 0 | 0 | 0 | 0 | 0 | PM |

### Imperial Hwy — EASTBOUND

| AM | NOON | PM | | |
|---|---|---|---|---|
| 0 | 1726 | 0 | | |
| 0 | 11 | 0 | 0 | |
| 0 | 289 | 0 | 2 | |
| 0 | 1041 | 0 | 3 | |
| 0 | 259 | 0 | 0 | |
| AM | NOON | PM | | |

### CONTROL

Signalized

| | | | |
|---|---|---|---|
| TEV | 0 AM | 5649 NOON | 0 PM |
| PHF | | 0.98 | |

### Imperial Hwy — WESTBOUND

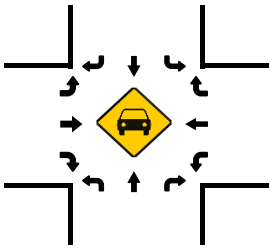
| PM | NOON | AM | |
|---|---|---|---|
| 0 | 164 | 0 | 1 |
| 0 | 1139 | 0 | 3 |
| 0 | 285 | 0 | 2 |
| 0 | 44 | 0 | 0 |
| 0 | 1470 | 0 | |
| PM | NOON | AM | |

### S Harbor Blvd — NORTHBOUND

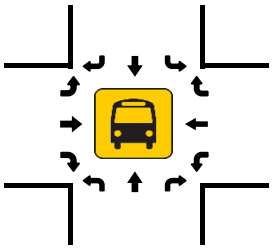
| | | | | | | |
|---|---|---|---|---|---|---|
| PM | 0 | 0 | 0 | 0 | 0 | PM |
| NOON | 1290 | 8 | 319 | 710 | 189 | NOON |
| AM | 0 | 0 | 0 | 0 | 0 | AM |

0 2 3 1

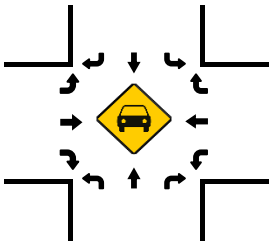
**Total Vehicles (AM)**



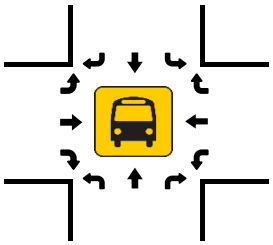
**Total Vehicles (AM)**



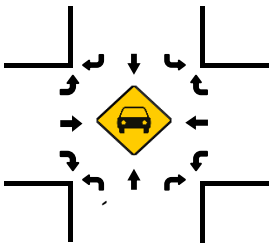
**Total Vehicles (NOON)**



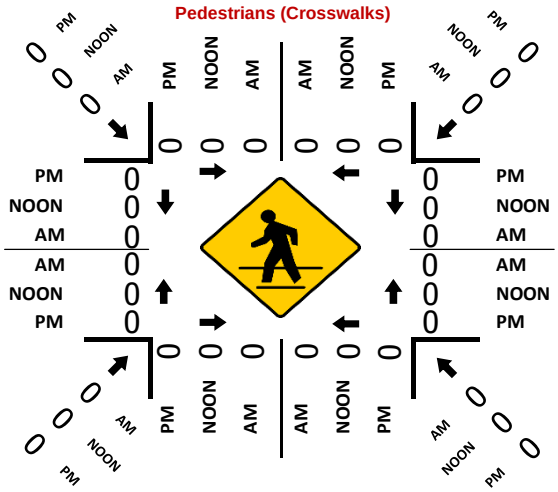
**Total Vehicles (NOON)**



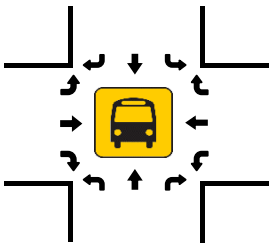
**Total Vehicles (PM)**



**Pedestrians (Crosswalks)**




**Total Vehicles (PM)**



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** S Puente St & Imperial Hwy
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01101-011
**Date:** 5/22/2019

**Total**

| NS/EW Streets: | S Puente St | | | | S Puente St | | | | Imperial Hwy | | | | Imperial Hwy | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 0 | 1 | 3 | 0 | 0 | 1 | 3 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 7:00 AM | 7 | 13 | 24 | 0 | 23 | 7 | 36 | 2 | 39 | 274 | 1 | 0 | 12 | 238 | 32 | 3 | 711 |
| 7:15 AM | 8 | 21 | 33 | 0 | 24 | 13 | 34 | 0 | 36 | 298 | 12 | 0 | 3 | 294 | 34 | 3 | 813 |
| 7:30 AM | 14 | 20 | 50 | 0 | 24 | 25 | 36 | 0 | 43 | 350 | 13 | 0 | 17 | 264 | 31 | 0 | 887 |
| 7:45 AM | 13 | 34 | 29 | 0 | 34 | 30 | 30 | 0 | 81 | 324 | 34 | 0 | 13 | 289 | 42 | 0 | 953 |
| 8:00 AM | 21 | 33 | 32 | 0 | 31 | 12 | 27 | 0 | 48 | 276 | 15 | 0 | 4 | 289 | 41 | 6 | 835 |
| 8:15 AM | 16 | 16 | 16 | 0 | 36 | 9 | 25 | 1 | 40 | 305 | 6 | 0 | 17 | 246 | 32 | 2 | 767 |
| 8:30 AM | 10 | 18 | 19 | 0 | 21 | 9 | 27 | 0 | 14 | 297 | 2 | 0 | 12 | 242 | 29 | 2 | 702 |
| 8:45 AM | 10 | 7 | 17 | 0 | 32 | 10 | 30 | 0 | 24 | 266 | 6 | 0 | 12 | 215 | 33 | 1 | 663 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 99 | 162 | 220 | 0 | 225 | 115 | 245 | 3 | 325 | 2390 | 89 | 0 | 90 | 2077 | 274 | 17 | 6331 |
| **APPROACH %'s :** | 20.58% | 33.68% | 45.74% | 0.00% | 38.27% | 19.56% | 41.67% | 0.51% | 11.59% | 85.24% | 3.17% | 0.00% | 3.66% | 84.50% | 11.15% | 0.69% | |
| **PEAK HR :** | 07:15 AM - 08:15 AM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 56 | 108 | 144 | 0 | 113 | 80 | 127 | 0 | 208 | 1248 | 74 | 0 | 37 | 1136 | 148 | 9 | 3488 |
| **PEAK HR FACTOR :** | 0.667 | 0.794 | 0.720 | 0.000 | 0.831 | 0.667 | 0.882 | 0.000 | 0.642 | 0.891 | 0.544 | 0.000 | 0.544 | 0.966 | 0.881 | 0.375 | 0.915 |
| | 0.895 | | | | 0.851 | | | | 0.871 | | | | 0.967 | | | | |

| PM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 0 | 1 | 3 | 0 | 0 | 1 | 3 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 4:00 PM | 9 | 10 | 15 | 0 | 40 | 20 | 52 | 1 | 29 | 335 | 6 | 0 | 20 | 403 | 48 | 7 | 995 |
| 4:15 PM | 6 | 13 | 20 | 0 | 25 | 13 | 34 | 0 | 23 | 334 | 4 | 0 | 31 | 394 | 70 | 3 | 970 |
| 4:30 PM | 7 | 9 | 15 | 0 | 26 | 33 | 45 | 2 | 39 | 339 | 8 | 0 | 18 | 375 | 51 | 2 | 969 |
| 4:45 PM | 9 | 13 | 20 | 0 | 38 | 17 | 40 | 0 | 22 | 329 | 5 | 0 | 24 | 368 | 52 | 8 | 945 |
| 5:00 PM | 8 | 8 | 16 | 0 | 51 | 30 | 83 | 2 | 25 | 343 | 14 | 0 | 29 | 429 | 54 | 3 | 1095 |
| 5:15 PM | 9 | 15 | 24 | 0 | 32 | 19 | 26 | 1 | 33 | 332 | 8 | 0 | 10 | 382 | 80 | 2 | 973 |
| 5:30 PM | 5 | 7 | 19 | 0 | 21 | 22 | 35 | 0 | 37 | 316 | 10 | 0 | 8 | 355 | 79 | 1 | 915 |
| 5:45 PM | 6 | 13 | 18 | 0 | 24 | 14 | 29 | 0 | 28 | 313 | 6 | 0 | 18 | 407 | 74 | 0 | 950 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 59 | 88 | 147 | 0 | 257 | 168 | 344 | 6 | 236 | 2641 | 61 | 0 | 158 | 3113 | 508 | 26 | 7812 |
| **APPROACH %'s :** | 20.07% | 29.93% | 50.00% | 0.00% | 33.16% | 21.68% | 44.39% | 0.77% | 8.03% | 89.89% | 2.08% | 0.00% | 4.15% | 81.81% | 13.35% | 0.68% | |
| **PEAK HR :** | 04:30 PM - 05:30 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 33 | 45 | 75 | 0 | 147 | 99 | 194 | 5 | 119 | 1343 | 35 | 0 | 81 | 1554 | 237 | 15 | 3982 |
| **PEAK HR FACTOR :** | 0.917 | 0.750 | 0.781 | 0.000 | 0.721 | 0.750 | 0.584 | 0.625 | 0.763 | 0.979 | 0.625 | 0.000 | 0.698 | 0.906 | 0.741 | 0.469 | 0.909 |
| | 0.797 | | | | 0.670 | | | | 0.970 | | | | 0.916 | | | | |

Prepared by National Data & Surveying Services

# S Puente St & Imperial Hwy

## Peak Hour Turning Movement Count

**ID:** 19-01101-011
**City:** Brea

**Day:** Wednesday
**Date:** 05/22/2019

| PEAK HOURS | COUNT PERIODS |
|---|---|
| 07:15 AM - 08:15 AM | 07:00 AM - 09:00 AM |
| NONE | NONE |
| 04:30 PM - 05:30 PM | 04:00 PM - 06:00 PM |

### S Puente St — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 127 | 80 | 113 | 0 | 464 | AM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| PM | 194 | 99 | 147 | 5 | 406 | PM |
| | 1 | 2 | 1 | 0 | | |

### Imperial Hwy — EASTBOUND

| AM | NOON | PM | |
|---|---|---|---|
| 1319 | 0 | 1781 | |
| 0 | 0 | 0 | 0 |
| 208 | 0 | 119 | 1 |
| 1248 | 0 | 1343 | 3 |
| 74 | 0 | 35 | 0 |
| AM | NOON | PM | |

### CONTROL

Signalized

| | | | |
|---|---|---|---|
| TEV | 3488 | 0 | 3982 |
| | AM | NOON | PM |
| PHF | 0.92 | | 0.91 |

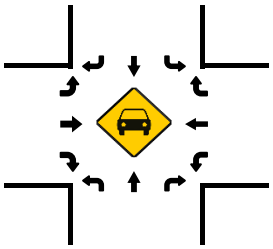
### Imperial Hwy — WESTBOUND

| PM | NOON | AM | |
|---|---|---|---|
| 237 | 0 | 148 | 1 |
| 1554 | 0 | 1136 | 3 |
| 81 | 0 | 37 | 1 |
| 15 | 0 | 9 | 0 |
| 1580 | 0 | 1514 | |
| PM | NOON | AM | |

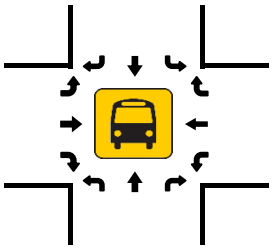
### S Puente St — NORTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| PM | 215 | 0 | 33 | 45 | 75 | PM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| AM | 191 | 0 | 56 | 108 | 144 | AM |
| | | 0 | 1 | 1 | 1 | |

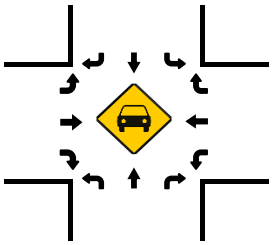
Total Vehicles (AM)



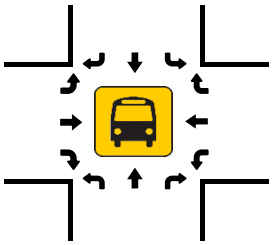
Total Vehicles (AM)



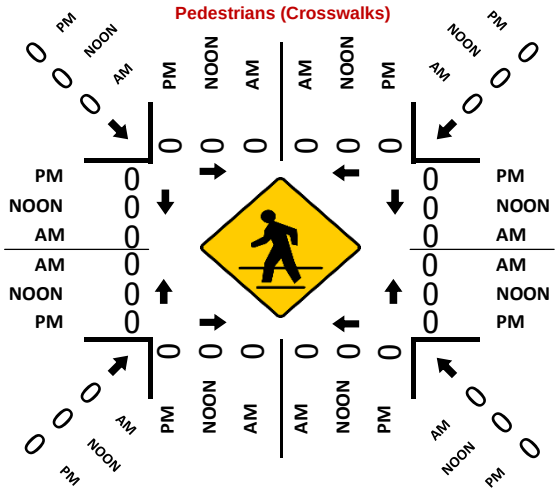
Total Vehicles (NOON)



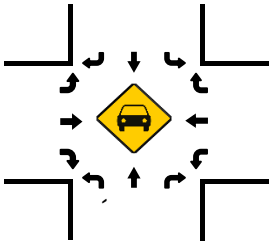
Total Vehicles (NOON)



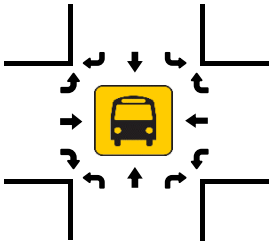
Pedestrians (Crosswalks)




Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** S Puente St & Imperial Hwy
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01101-011
**Date:** 5/18/2019

**Total**

| NS/EW Streets: | S Puente St | | | | S Puente St | | | | Imperial Hwy | | | | Imperial Hwy | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NOON** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 0 | 1 | 3 | 0 | 0 | 1 | 3 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 11:00 AM | 10 | 11 | 34 | 0 | 19 | 11 | 13 | 1 | 10 | 243 | 9 | 1 | 18 | 210 | 19 | 1 | 610 |
| 11:15 AM | 7 | 9 | 37 | 0 | 32 | 13 | 17 | 0 | 15 | 271 | 8 | 0 | 13 | 240 | 24 | 2 | 688 |
| 11:30 AM | 6 | 9 | 18 | 0 | 24 | 8 | 27 | 0 | 30 | 247 | 9 | 0 | 22 | 190 | 27 | 1 | 618 |
| 11:45 AM | 11 | 5 | 27 | 0 | 18 | 13 | 26 | 1 | 17 | 298 | 10 | 2 | 13 | 277 | 29 | 1 | 748 |
| 12:00 PM | 5 | 7 | 15 | 0 | 34 | 13 | 36 | 1 | 17 | 296 | 11 | 0 | 12 | 309 | 25 | 2 | 783 |
| 12:15 PM | 4 | 10 | 26 | 0 | 25 | 6 | 18 | 0 | 17 | 295 | 6 | 2 | 20 | 328 | 43 | 4 | 804 |
| 12:30 PM | 5 | 7 | 19 | 0 | 30 | 8 | 29 | 1 | 11 | 305 | 7 | 0 | 15 | 319 | 40 | 4 | 800 |
| 12:45 PM | 7 | 7 | 22 | 0 | 17 | 11 | 25 | 0 | 16 | 296 | 6 | 1 | 11 | 273 | 23 | 2 | 717 |
| 1:00 PM | 6 | 7 | 19 | 0 | 29 | 10 | 20 | 0 | 14 | 271 | 6 | 0 | 11 | 303 | 23 | 2 | 721 |
| 1:15 PM | 5 | 4 | 24 | 0 | 14 | 6 | 11 | 0 | 27 | 294 | 2 | 0 | 11 | 300 | 21 | 3 | 722 |
| 1:30 PM | 4 | 6 | 11 | 0 | 29 | 8 | 29 | 0 | 18 | 293 | 3 | 1 | 6 | 296 | 24 | 2 | 730 |
| 1:45 PM | 10 | 12 | 22 | 0 | 22 | 10 | 19 | 0 | 14 | 273 | 5 | 0 | 14 | 319 | 17 | 2 | 739 |
| 2:00 PM | 6 | 11 | 28 | 0 | 14 | 18 | 26 | 0 | 11 | 274 | 13 | 1 | 22 | 303 | 27 | 2 | 756 |
| 2:15 PM | 11 | 6 | 18 | 0 | 27 | 8 | 22 | 0 | 19 | 259 | 10 | 1 | 12 | 288 | 31 | 0 | 712 |
| 2:30 PM | 7 | 9 | 17 | 0 | 22 | 13 | 30 | 0 | 16 | 289 | 9 | 2 | 19 | 300 | 24 | 2 | 759 |
| 2:45 PM | 11 | 11 | 21 | 0 | 24 | 13 | 24 | 0 | 8 | 259 | 4 | 2 | 13 | 281 | 15 | 2 | 688 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 115 | 131 | 358 | 0 | 380 | 169 | 372 | 4 | 260 | 4463 | 118 | 13 | 232 | 4536 | 412 | 32 | 11595 |
| **APPROACH %'s :** | 19.04% | 21.69% | 59.27% | 0.00% | 41.08% | 18.27% | 40.22% | 0.43% | 5.36% | 91.94% | 2.43% | 0.27% | 4.45% | 87.03% | 7.90% | 0.61% | |
| **PEAK HR :** | 11:45 AM - 12:45 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 25 | 29 | 87 | 0 | 107 | 40 | 109 | 3 | 62 | 1194 | 34 | 4 | 60 | 1233 | 137 | 11 | 3135 |
| **PEAK HR FACTOR :** | 0.568 | 0.725 | 0.806 | 0.000 | 0.787 | 0.769 | 0.757 | 0.750 | 0.912 | 0.979 | 0.773 | 0.500 | 0.750 | 0.940 | 0.797 | 0.688 | 0.975 |
| | | 0.820 | | | | 0.771 | | | | 0.989 | | | | 0.912 | | | |

Prepared by National Data & Surveying Services

# S Puente St & Imperial Hwy

## Peak Hour Turning Movement Count

**ID:** 19-01101-011
**City:** Brea

**Day:** Saturday
**Date:** 05/18/2019

| PEAK HOURS | COUNT PERIODS |
|---|---|
| AM: NONE | AM: NONE |
| NOON: 11:45 AM - 12:45 PM | NOON: 11:00 AM - 03:00 PM |
| PM: NONE | PM: NONE |

### S Puente St — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 0 | 0 | 0 | 0 | 0 | AM |
| NOON | 109 | 40 | 107 | 3 | 231 | NOON |
| PM | 0 | 0 | 0 | 0 | 0 | PM |
| | 1 | 2 | 1 | 0 | | |

### Imperial Hwy — EASTBOUND

| AM | NOON | PM | |
|---|---|---|---|
| 0 | 1371 | 0 | |
| 0 | 4 | 0 | 0 |
| 0 | 62 | 0 | 1 |
| 0 | 1194 | 0 | 3 |
| 0 | 34 | 0 | 0 |

### CONTROL

Signalized

| | AM | NOON | PM |
|---|---|---|---|
| TEV | 0 | 3135 | 0 |
| PHF | | 0.97 | |

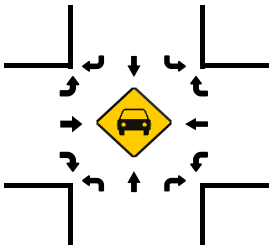
### Imperial Hwy — WESTBOUND

| PM | NOON | AM | |
|---|---|---|---|
| 0 | 137 | 0 | 1 |
| 0 | 1233 | 0 | 3 |
| 0 | 60 | 0 | 1 |
| 0 | 11 | 0 | 0 |
| 0 | 1399 | 0 | |

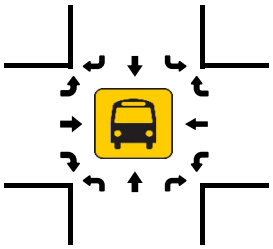
### NORTHBOUND — S Puente St

| | | | | | | |
|---|---|---|---|---|---|---|
| | 0 | 1 | 1 | 1 | | |
| PM | 0 | 0 | 0 | 0 | 0 | PM |
| NOON | 134 | 0 | 25 | 29 | 87 | NOON |
| AM | 0 | 0 | 0 | 0 | 0 | AM |

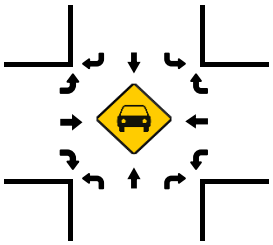
Total Vehicles (AM)



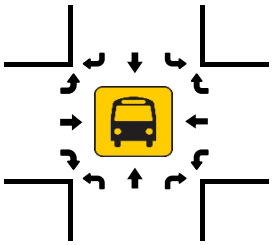
Total Vehicles (AM)



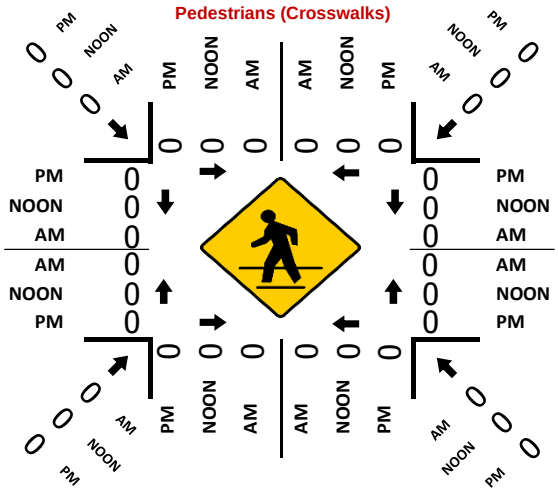
Total Vehicles (NOON)



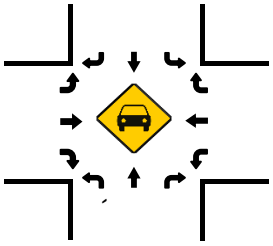
Total Vehicles (NOON)



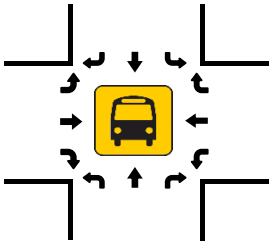
Pedestrians (Crosswalks)




Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** S Brea Blvd & Imperial Hwy
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01101-012
**Date:** 5/22/2019

**Total**

| NS/EW Streets: | S Brea Blvd | | | | S Brea Blvd | | | | Imperial Hwy | | | | Imperial Hwy | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 2 | 3 | 1 | 0 | 2 | 2 | 1 | 0 | 2 | 3 | 1 | 0 | 2 | 3 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 7:00 AM | 60 | 60 | 33 | 0 | 25 | 214 | 27 | 1 | 6 | 309 | 64 | 1 | 29 | 280 | 10 | 0 | 1119 |
| 7:15 AM | 89 | 70 | 21 | 1 | 17 | 237 | 36 | 0 | 17 | 342 | 46 | 5 | 37 | 333 | 10 | 1 | 1262 |
| 7:30 AM | 106 | 99 | 39 | 3 | 28 | 222 | 32 | 1 | 28 | 388 | 84 | 4 | 25 | 331 | 12 | 0 | 1402 |
| 7:45 AM | 122 | 145 | 37 | 0 | 34 | 206 | 50 | 2 | 31 | 359 | 102 | 2 | 42 | 380 | 19 | 2 | 1533 |
| 8:00 AM | 85 | 116 | 35 | 0 | 38 | 234 | 37 | 0 | 33 | 314 | 97 | 4 | 31 | 295 | 19 | 3 | 1341 |
| 8:15 AM | 81 | 94 | 34 | 1 | 31 | 228 | 41 | 5 | 20 | 340 | 66 | 2 | 30 | 272 | 15 | 0 | 1260 |
| 8:30 AM | 74 | 110 | 38 | 1 | 33 | 234 | 37 | 1 | 16 | 330 | 61 | 1 | 39 | 248 | 16 | 0 | 1239 |
| 8:45 AM | 84 | 96 | 57 | 1 | 36 | 216 | 30 | 2 | 25 | 244 | 89 | 3 | 42 | 279 | 15 | 1 | 1220 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 701 | 790 | 294 | 7 | 242 | 1791 | 290 | 12 | 176 | 2626 | 609 | 22 | 275 | 2418 | 116 | 7 | 10376 |
| **APPROACH %'s :** | 39.12% | 44.08% | 16.41% | 0.39% | 10.36% | 76.70% | 12.42% | 0.51% | 5.13% | 76.49% | 17.74% | 0.64% | 9.77% | 85.87% | 4.12% | 0.25% | |
| **PEAK HR :** | 07:15 AM - 08:15 AM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 402 | 430 | 132 | 4 | 117 | 899 | 155 | 3 | 109 | 1403 | 329 | 15 | 135 | 1339 | 60 | 6 | 5538 |
| **PEAK HR FACTOR :** | 0.824 | 0.741 | 0.846 | 0.333 | 0.770 | 0.948 | 0.775 | 0.375 | 0.826 | 0.904 | 0.806 | 0.750 | 0.804 | 0.881 | 0.789 | 0.500 | 0.903 |
| | 0.796 | | | | 0.950 | | | | 0.921 | | | | 0.869 | | | | |

| PM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 1 | 0 | 2 | 2 | 1 | 0 | 2 | 3 | 1 | 0 | 2 | 3 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 4:00 PM | 103 | 154 | 44 | 4 | 25 | 125 | 37 | 2 | 34 | 334 | 77 | 2 | 54 | 362 | 17 | 0 | 1374 |
| 4:15 PM | 88 | 180 | 56 | 2 | 29 | 142 | 53 | 4 | 38 | 354 | 88 | 0 | 51 | 404 | 26 | 2 | 1517 |
| 4:30 PM | 99 | 191 | 51 | 0 | 38 | 130 | 41 | 3 | 48 | 348 | 96 | 2 | 44 | 367 | 31 | 1 | 1490 |
| 4:45 PM | 99 | 167 | 47 | 1 | 53 | 123 | 35 | 4 | 57 | 359 | 95 | 3 | 51 | 375 | 24 | 1 | 1494 |
| 5:00 PM | 120 | 184 | 56 | 1 | 49 | 146 | 46 | 5 | 48 | 383 | 100 | 3 | 64 | 399 | 35 | 0 | 1639 |
| 5:15 PM | 108 | 197 | 45 | 1 | 44 | 172 | 33 | 7 | 36 | 400 | 99 | 2 | 53 | 386 | 36 | 0 | 1619 |
| 5:30 PM | 113 | 195 | 65 | 1 | 34 | 143 | 47 | 1 | 38 | 379 | 85 | 1 | 55 | 395 | 26 | 1 | 1579 |
| 5:45 PM | 136 | 188 | 57 | 0 | 47 | 138 | 41 | 8 | 42 | 394 | 102 | 8 | 30 | 411 | 34 | 1 | 1637 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 866 | 1456 | 421 | 10 | 319 | 1119 | 333 | 34 | 341 | 2951 | 742 | 21 | 402 | 3099 | 229 | 6 | 12349 |
| **APPROACH %'s :** | 31.46% | 52.89% | 15.29% | 0.36% | 17.67% | 61.99% | 18.45% | 1.88% | 8.41% | 72.77% | 18.30% | 0.52% | 10.76% | 82.95% | 6.13% | 0.16% | |
| **PEAK HR :** | 05:00 PM - 06:00 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 477 | 764 | 223 | 3 | 174 | 599 | 167 | 21 | 164 | 1556 | 386 | 14 | 202 | 1591 | 131 | 2 | 6474 |
| **PEAK HR FACTOR :** | 0.877 | 0.970 | 0.858 | 0.750 | 0.888 | 0.871 | 0.888 | 0.656 | 0.854 | 0.973 | 0.946 | 0.438 | 0.789 | 0.968 | 0.910 | 0.500 | 0.987 |
| | 0.963 | | | | 0.938 | | | | 0.971 | | | | 0.967 | | | | |

Prepared by National Data & Surveying Services

# S Brea Blvd & Imperial Hwy

## Peak Hour Turning Movement Count

**ID:** 19-01101-012
**City:** Brea

**Day:** Wednesday
**Date:** 05/22/2019

**PEAK HOURS**

AM: 07:15 AM - 08:15 AM
NOON: NONE
PM: 05:00 PM - 06:00 PM

**COUNT PERIODS**

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

### S Brea Blvd — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 155 | 899 | 117 | 3 | 602 | AM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| PM | 167 | 599 | 174 | 21 | 1080 | PM |
| | 1 | 2 | 2 | 0 | | |

### Imperial Hwy — EASTBOUND

| AM | NOON | PM | |
|---|---|---|---|
| 1911 | 0 | 2249 | |
| 15 | 0 | 14 | 0 |
| 109 | 0 | 164 | 2 |
| 1403 | 0 | 1556 | 3 |
| 329 | 0 | 386 | 1 |

### CONTROL

Signalized

| | | | |
|---|---|---|---|
| TEV | 5538 | 0 | 6474 |
| | AM | NOON | PM |
| PHF | 0.90 | | 0.99 |

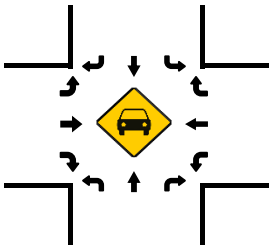
### Imperial Hwy — WESTBOUND

| PM | NOON | AM | |
|---|---|---|---|
| 131 | 0 | 60 | 1 |
| 1591 | 0 | 1339 | 3 |
| 202 | 0 | 135 | 2 |
| 2 | 0 | 6 | 0 |
| 1955 | 0 | 1658 | |

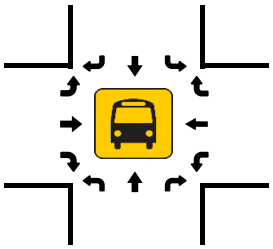
### S Brea Blvd — NORTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| | 0 | 2 | 3 | 1 | | |
| PM | 1190 | 3 | 477 | 764 | 223 | PM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| AM | 1367 | 4 | 402 | 430 | 132 | AM |

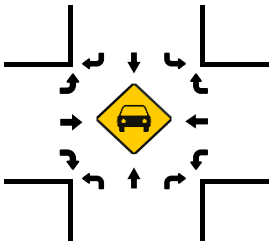
Total Vehicles (AM)



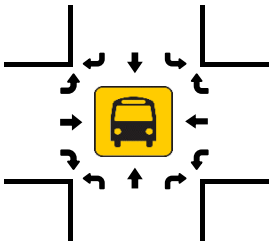
Total Vehicles (AM)



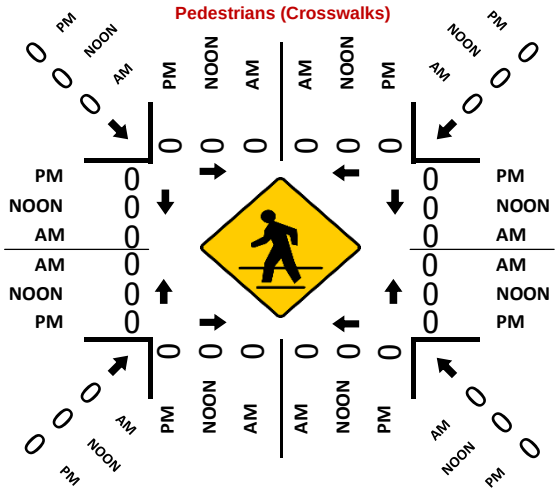
Total Vehicles (NOON)



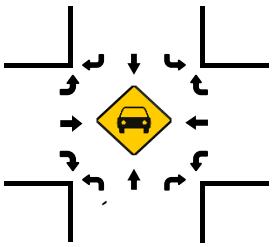
Total Vehicles (NOON)



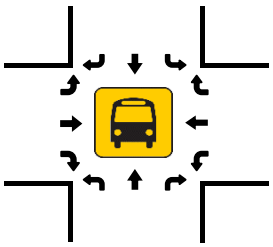
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** Brea Blvd & Imperial Hwy
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01133-012
**Date:** 6/29/2019

**Total**

| NS/EW Streets: | Brea Blvd | | | | Brea Blvd | | | | Imperial Hwy | | | | Imperial Hwy | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NOON** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 2 NL | 3 NT | 1 NR | 0 NU | 2 SL | 2 ST | 1 SR | 0 SU | 2 EL | 3 ET | 1 ER | 0 EU | 2 WL | 3 WT | 1 WR | 0 WU | TOTAL |
| 11:00 AM | 65 | 112 | 80 | 3 | 42 | 109 | 34 | 0 | 22 | 302 | 58 | 2 | 74 | 200 | 31 | 3 | 1137 |
| 11:15 AM | 82 | 109 | 78 | 1 | 50 | 103 | 37 | 2 | 33 | 237 | 49 | 5 | 60 | 235 | 32 | 3 | 1116 |
| 11:30 AM | 115 | 96 | 69 | 3 | 42 | 110 | 35 | 3 | 32 | 321 | 73 | 2 | 59 | 274 | 34 | 4 | 1272 |
| 11:45 AM | 82 | 108 | 60 | 3 | 66 | 117 | 29 | 1 | 19 | 263 | 73 | 4 | 68 | 251 | 37 | 3 | 1184 |
| 12:00 PM | 93 | 114 | 84 | 1 | 56 | 105 | 50 | 3 | 26 | 310 | 91 | 4 | 83 | 270 | 36 | 6 | 1332 |
| 12:15 PM | 99 | 86 | 63 | 4 | 46 | 119 | 45 | 2 | 48 | 296 | 65 | 3 | 57 | 240 | 32 | 12 | 1217 |
| 12:30 PM | 77 | 127 | 64 | 3 | 60 | 122 | 40 | 2 | 25 | 359 | 100 | 1 | 66 | 299 | 31 | 7 | 1383 |
| 12:45 PM | 83 | 104 | 58 | 2 | 47 | 129 | 43 | 3 | 31 | 280 | 83 | 3 | 91 | 233 | 24 | 5 | 1219 |
| 1:00 PM | 92 | 123 | 65 | 8 | 49 | 210 | 35 | 4 | 44 | 299 | 70 | 2 | 93 | 329 | 39 | 7 | 1469 |
| 1:15 PM | 92 | 121 | 57 | 6 | 58 | 225 | 42 | 2 | 45 | 333 | 58 | 3 | 57 | 282 | 38 | 9 | 1428 |
| 1:30 PM | 86 | 109 | 62 | 4 | 69 | 201 | 47 | 3 | 46 | 348 | 71 | 1 | 64 | 310 | 30 | 6 | 1457 |
| 1:45 PM | 87 | 96 | 52 | 5 | 60 | 151 | 41 | 2 | 24 | 311 | 44 | 3 | 65 | 302 | 31 | 5 | 1279 |
| 2:00 PM | 80 | 87 | 51 | 3 | 57 | 129 | 43 | 3 | 39 | 264 | 67 | 0 | 58 | 260 | 26 | 8 | 1175 |
| 2:15 PM | 76 | 99 | 69 | 4 | 78 | 131 | 41 | 4 | 34 | 284 | 64 | 2 | 58 | 305 | 29 | 11 | 1289 |
| 2:30 PM | 88 | 91 | 45 | 4 | 53 | 143 | 50 | 2 | 26 | 290 | 64 | 2 | 57 | 290 | 27 | 3 | 1235 |
| 2:45 PM | 88 | 86 | 55 | 2 | 49 | 103 | 33 | 2 | 34 | 278 | 65 | 1 | 71 | 304 | 40 | 4 | 1215 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 1385 | 1668 | 1012 | 56 | 882 | 2207 | 645 | 38 | 528 | 4775 | 1095 | 38 | 1081 | 4384 | 517 | 96 | 20407 |
| **APPROACH %'s :** | 33.61% | 40.48% | 24.56% | 1.36% | 23.38% | 58.51% | 17.10% | 1.01% | 8.20% | 74.19% | 17.01% | 0.59% | 17.79% | 72.13% | 8.51% | 1.58% | |
| **PEAK HR :** | 01:00 PM - 02:00 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 357 | 449 | 236 | 23 | 236 | 787 | 165 | 11 | 159 | 1291 | 243 | 9 | 279 | 1223 | 138 | 27 | 5633 |
| **PEAK HR FACTOR :** | 0.970 | 0.913 | 0.908 | 0.719 | 0.855 | 0.874 | 0.878 | 0.688 | 0.864 | 0.927 | 0.856 | 0.750 | 0.750 | 0.929 | 0.885 | 0.750 | 0.959 |
| | | 0.924 | | | | 0.917 | | | | 0.913 | | | | 0.890 | | | |

Prepared by National Data & Surveying Services

# Brea Blvd & Imperial Hwy

## Peak Hour Turning Movement Count

**ID:** 19-01133-012
**City:** Brea

**Day:** Saturday
**Date:** 06/29/2019

| PEAK HOURS | COUNT PERIODS |
|---|---|
| NONE | NONE |
| 01:00 PM - 02:00 PM | 11:00 AM - 03:00 PM |
| NONE | NONE |

**Brea Blvd**

**SOUTHBOUND**

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 0 | 0 | 0 | 0 | 0 | AM |
| NOON | 165 | 787 | 236 | 11 | 757 | NOON |
| PM | 0 | 0 | 0 | 0 | 0 | PM |

1 2 2 0

**EASTBOUND** (Imperial Hwy)

| AM | NOON | PM | |
|---|---|---|---|
| 0 | 1754 | 0 | |
| 0 | 9 | 0 | 0 |
| 0 | 159 | 0 | 2 |
| 0 | 1291 | 0 | 3 |
| 0 | 243 | 0 | 1 |

**CONTROL**

Signalized

| | | | |
|---|---|---|---|
| TEV | 0 AM | 5633 NOON | 0 PM |
| PHF | | 0.96 | |

**WESTBOUND** (Imperial Hwy)

| PM | NOON | AM | |
|---|---|---|---|
| 0 | 138 | 0 | 1 |
| 0 | 1223 | 0 | 3 |
| 0 | 279 | 0 | 2 |
| 0 | 27 | 0 | 0 |
| 0 | 1790 | 0 | |

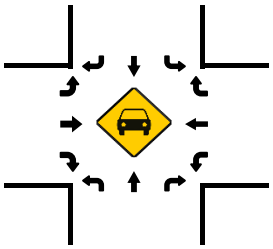
0 2 3 1

| | | | | | | |
|---|---|---|---|---|---|---|
| PM | 0 | 0 | 0 | 0 | 0 | PM |
| NOON | 1332 | 23 | 357 | 449 | 236 | NOON |
| AM | 0 | 0 | 0 | 0 | 0 | AM |

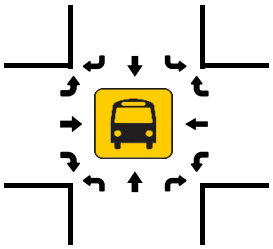
**NORTHBOUND**

**Brea Blvd**

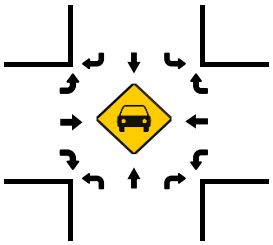
Total Vehicles (AM)



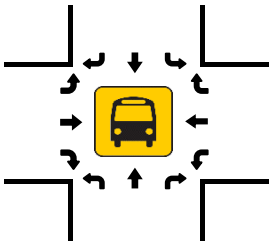
Total Vehicles (AM)



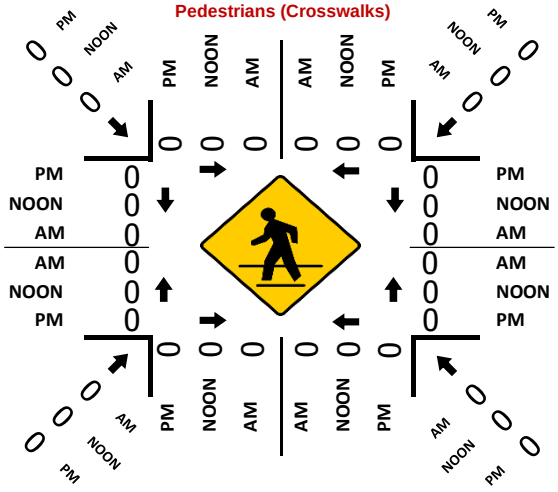
Total Vehicles (NOON)



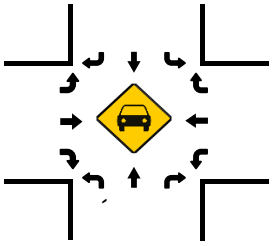
Total Vehicles (NOON)



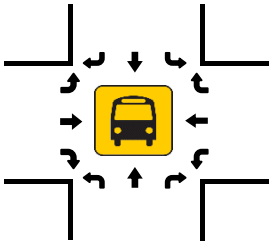
Pedestrians (Crosswalks)




Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** S Randolph Ave & Imperial Hwy
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01101-013
**Date:** 5/22/2019

**Total**

| NS/EW Streets: | S Randolph Ave | | | | S Randolph Ave | | | | Imperial Hwy | | | | Imperial Hwy | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 1.5 | 1 | 0.5 | 0 | 2 | 0.5 | 0.5 | 0 | 2 | 3 | 0 | 0 | 1 | 3 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 7:00 AM | 2 | 2 | 5 | 0 | 27 | 5 | 9 | 0 | 7 | 350 | 1 | 1 | 2 | 267 | 25 | 0 | 703 |
| 7:15 AM | 3 | 3 | 11 | 0 | 36 | 4 | 8 | 0 | 8 | 350 | 1 | 0 | 5 | 339 | 18 | 1 | 787 |
| 7:30 AM | 2 | 3 | 15 | 0 | 22 | 4 | 3 | 0 | 10 | 406 | 2 | 1 | 5 | 355 | 35 | 1 | 864 |
| 7:45 AM | 2 | 2 | 11 | 0 | 28 | 2 | 3 | 0 | 12 | 356 | 3 | 2 | 6 | 402 | 48 | 1 | 878 |
| 8:00 AM | 7 | 5 | 13 | 0 | 33 | 3 | 9 | 0 | 12 | 332 | 3 | 2 | 4 | 300 | 35 | 0 | 758 |
| 8:15 AM | 10 | 4 | 7 | 0 | 34 | 4 | 9 | 0 | 10 | 374 | 1 | 0 | 4 | 283 | 34 | 1 | 775 |
| 8:30 AM | 6 | 4 | 10 | 0 | 20 | 5 | 10 | 0 | 21 | 348 | 2 | 4 | 7 | 279 | 46 | 0 | 762 |
| 8:45 AM | 5 | 2 | 9 | 0 | 22 | 3 | 18 | 0 | 15 | 290 | 5 | 2 | 8 | 332 | 61 | 2 | 774 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 37 | 25 | 81 | 0 | 222 | 30 | 69 | 0 | 95 | 2806 | 18 | 12 | 41 | 2557 | 302 | 6 | 6301 |
| **APPROACH %'s :** | 25.87% | 17.48% | 56.64% | 0.00% | 69.16% | 9.35% | 21.50% | 0.00% | 3.24% | 95.74% | 0.61% | 0.41% | 1.41% | 87.99% | 10.39% | 0.21% | |
| **PEAK HR :** | 07:15 AM - 08:15 AM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 14 | 13 | 50 | 0 | 119 | 13 | 23 | 0 | 42 | 1444 | 9 | 5 | 20 | 1396 | 136 | 3 | 3287 |
| **PEAK HR FACTOR :** | 0.500 | 0.650 | 0.833 | 0.000 | 0.826 | 0.813 | 0.639 | 0.000 | 0.875 | 0.889 | 0.750 | 0.625 | 0.833 | 0.868 | 0.708 | 0.750 | 0.936 |
| | 0.770 | | | | 0.807 | | | | 0.895 | | | | 0.851 | | | | |

| **PM** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.5 | 1 | 0.5 | 0 | 2 | 0.5 | 0.5 | 0 | 2 | 3 | 0 | 0 | 1 | 3 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 4:00 PM | 12 | 4 | 14 | 0 | 55 | 1 | 41 | 0 | 29 | 337 | 2 | 1 | 11 | 383 | 59 | 0 | 949 |
| 4:15 PM | 7 | 3 | 9 | 0 | 59 | 3 | 37 | 0 | 37 | 355 | 2 | 4 | 8 | 395 | 66 | 1 | 986 |
| 4:30 PM | 3 | 4 | 9 | 0 | 76 | 5 | 25 | 0 | 43 | 335 | 5 | 2 | 7 | 413 | 75 | 0 | 1002 |
| 4:45 PM | 9 | 6 | 17 | 0 | 50 | 8 | 31 | 0 | 41 | 360 | 7 | 2 | 11 | 430 | 70 | 0 | 1042 |
| 5:00 PM | 8 | 7 | 9 | 0 | 81 | 4 | 55 | 0 | 38 | 384 | 7 | 1 | 8 | 457 | 71 | 2 | 1132 |
| 5:15 PM | 10 | 10 | 13 | 0 | 70 | 7 | 34 | 1 | 45 | 382 | 5 | 0 | 13 | 479 | 66 | 1 | 1136 |
| 5:30 PM | 13 | 6 | 16 | 0 | 78 | 7 | 46 | 0 | 63 | 358 | 8 | 2 | 9 | 468 | 70 | 1 | 1145 |
| 5:45 PM | 10 | 8 | 18 | 0 | 69 | 5 | 37 | 0 | 59 | 393 | 6 | 1 | 19 | 349 | 100 | 0 | 1074 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 72 | 48 | 105 | 0 | 538 | 40 | 306 | 1 | 355 | 2904 | 42 | 13 | 86 | 3374 | 577 | 5 | 8466 |
| **APPROACH %'s :** | 32.00% | 21.33% | 46.67% | 0.00% | 60.79% | 4.52% | 34.58% | 0.11% | 10.71% | 87.63% | 1.27% | 0.39% | 2.13% | 83.47% | 14.28% | 0.12% | |
| **PEAK HR :** | 05:00 PM - 06:00 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 41 | 31 | 56 | 0 | 298 | 23 | 172 | 1 | 205 | 1517 | 26 | 4 | 49 | 1753 | 307 | 4 | 4487 |
| **PEAK HR FACTOR :** | 0.788 | 0.775 | 0.778 | 0.000 | 0.920 | 0.821 | 0.782 | 0.250 | 0.813 | 0.965 | 0.813 | 0.500 | 0.645 | 0.915 | 0.768 | 0.500 | 0.980 |
| | 0.889 | | | | 0.882 | | | | 0.954 | | | | 0.945 | | | | |

Prepared by National Data & Surveying Services

# S Randolph Ave & Imperial Hwy

## Peak Hour Turning Movement Count

**ID:** 19-01101-013
**City:** Brea

**Day:** Wednesday
**Date:** 05/22/2019

| PEAK HOURS | COUNT PERIODS |
|---|---|
| 07:15 AM - 08:15 AM | 07:00 AM - 09:00 AM |
| NONE | NONE |
| 05:00 PM - 06:00 PM | 04:00 PM - 06:00 PM |

### S Randolph Ave — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 23 | 13 | 119 | 0 | 191 | AM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| PM | 172 | 23 | 298 | 1 | 544 | PM |
| | 0.5 | 0.5 | 2 | 0 | | |

### Imperial Hwy — EASTBOUND

| AM | NOON | PM | |
|---|---|---|---|
| 1438 | 0 | 1970 | |
| 5 | 0 | 4 | 0 |
| 42 | 0 | 205 | 2 |
| 1444 | 0 | 1517 | 3 |
| 9 | 0 | 26 | 0 |

### CONTROL

Signalized

| | | | |
|---|---|---|---|
| TEV | 3287 | 0 | 4487 |
| | AM | NOON | PM |
| PHF | 0.94 | | 0.98 |

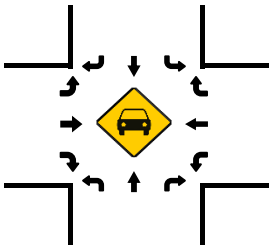
### Imperial Hwy — WESTBOUND

| PM | NOON | AM | |
|---|---|---|---|
| 307 | 0 | 136 | 1 |
| 1753 | 0 | 1396 | 3 |
| 49 | 0 | 20 | 1 |
| 4 | 0 | 3 | 0 |
| 1875 | 0 | 1616 | |

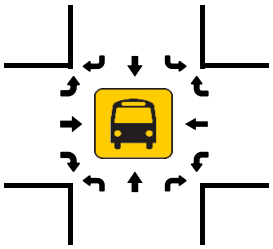
### S Randolph Ave — NORTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| | 0 | 1.5 | 1 | 0.5 | | |
| PM | 98 | 0 | 41 | 31 | 56 | PM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| AM | 42 | 0 | 14 | 13 | 50 | AM |

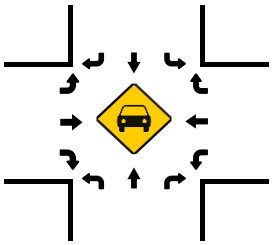
Total Vehicles (AM)



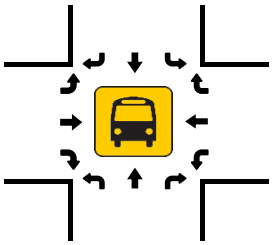
Total Vehicles (AM)



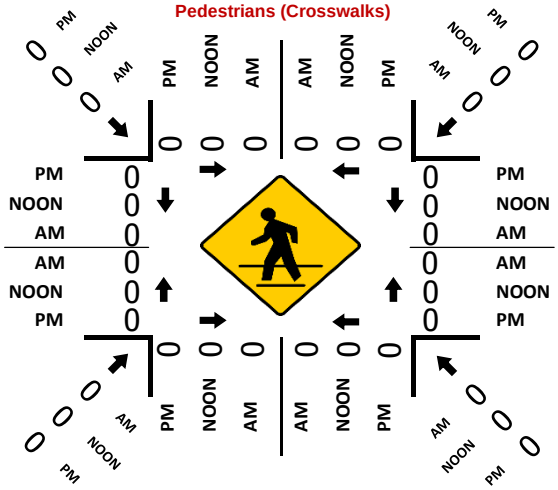
Total Vehicles (NOON)



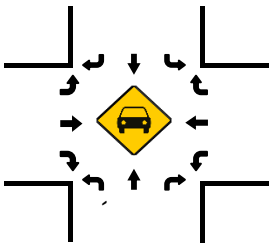
Total Vehicles (NOON)



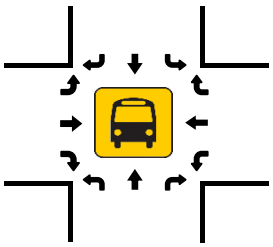
Pedestrians (Crosswalks)




Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** S Randolph Ave & Imperial Hwy
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01101-013
**Date:** 5/18/2019

**Total**

| NS/EW Streets: | S Randolph Ave | | | | S Randolph Ave | | | | Imperial Hwy | | | | Imperial Hwy | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NOON** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 1.5 | 1 | 0.5 | 0 | 2 | 0.5 | 0.5 | 0 | 2 | 3 | 0 | 0 | 1 | 3 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 11:00 AM | 12 | 9 | 18 | 0 | 67 | 11 | 33 | 0 | 55 | 315 | 8 | 9 | 29 | 324 | 105 | 1 | 996 |
| 11:15 AM | 11 | 16 | 30 | 0 | 59 | 10 | 38 | 0 | 59 | 353 | 6 | 5 | 28 | 281 | 116 | 3 | 1015 |
| 11:30 AM | 13 | 13 | 30 | 0 | 71 | 15 | 24 | 0 | 60 | 331 | 7 | 14 | 29 | 361 | 124 | 2 | 1094 |
| 11:45 AM | 16 | 5 | 25 | 0 | 76 | 10 | 46 | 0 | 68 | 299 | 3 | 4 | 34 | 378 | 117 | 2 | 1083 |
| 12:00 PM | 14 | 9 | 27 | 0 | 72 | 14 | 49 | 2 | 64 | 332 | 8 | 1 | 17 | 356 | 118 | 3 | 1086 |
| 12:15 PM | 18 | 5 | 38 | 0 | 72 | 5 | 40 | 0 | 53 | 336 | 11 | 5 | 45 | 351 | 108 | 4 | 1091 |
| 12:30 PM | 17 | 15 | 33 | 0 | 70 | 10 | 52 | 0 | 70 | 353 | 5 | 8 | 32 | 362 | 115 | 3 | 1145 |
| 12:45 PM | 13 | 9 | 41 | 0 | 79 | 12 | 43 | 0 | 62 | 324 | 13 | 4 | 26 | 370 | 105 | 0 | 1101 |
| 1:00 PM | 17 | 13 | 31 | 0 | 103 | 17 | 55 | 0 | 75 | 307 | 3 | 4 | 27 | 350 | 118 | 2 | 1122 |
| 1:15 PM | 16 | 10 | 40 | 0 | 88 | 16 | 50 | 0 | 47 | 332 | 7 | 4 | 26 | 378 | 101 | 3 | 1118 |
| 1:30 PM | 16 | 11 | 38 | 0 | 105 | 22 | 64 | 0 | 63 | 326 | 5 | 1 | 21 | 357 | 115 | 2 | 1146 |
| 1:45 PM | 18 | 7 | 55 | 0 | 83 | 17 | 58 | 0 | 78 | 346 | 8 | 4 | 26 | 368 | 101 | 8 | 1177 |
| 2:00 PM | 14 | 8 | 31 | 0 | 103 | 17 | 65 | 0 | 58 | 350 | 10 | 1 | 16 | 384 | 112 | 2 | 1171 |
| 2:15 PM | 15 | 6 | 39 | 0 | 86 | 27 | 63 | 0 | 69 | 324 | 6 | 0 | 16 | 330 | 95 | 1 | 1077 |
| 2:30 PM | 16 | 4 | 30 | 0 | 83 | 10 | 60 | 0 | 63 | 331 | 2 | 4 | 22 | 378 | 94 | 4 | 1101 |
| 2:45 PM | 11 | 13 | 27 | 0 | 74 | 12 | 72 | 0 | 58 | 321 | 9 | 3 | 23 | 348 | 112 | 3 | 1086 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 237 | 153 | 533 | 0 | 1291 | 225 | 812 | 2 | 1002 | 5280 | 111 | 71 | 417 | 5676 | 1756 | 43 | 17609 |
| **APPROACH %'s :** | 25.68% | 16.58% | 57.75% | 0.00% | 55.41% | 9.66% | 34.85% | 0.09% | 15.50% | 81.68% | 1.72% | 1.10% | 5.28% | 71.92% | 22.25% | 0.54% | |
| **PEAK HR :** | 01:15 PM - 02:15 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 64 | 36 | 164 | 0 | 379 | 72 | 237 | 0 | 246 | 1354 | 30 | 10 | 89 | 1487 | 429 | 15 | 4612 |
| **PEAK HR FACTOR :** | 0.889 | 0.818 | 0.745 | 0.000 | 0.902 | 0.818 | 0.912 | 0.000 | 0.788 | 0.967 | 0.750 | 0.625 | 0.856 | 0.968 | 0.933 | 0.469 | 0.980 |
| | | 0.825 | | | | 0.901 | | | | 0.940 | | | | 0.982 | | | |

Prepared by National Data & Surveying Services

# S Randolph Ave & Imperial Hwy

## Peak Hour Turning Movement Count

**ID:** 19-01101-013
**City:** Brea

**Day:** Saturday
**Date:** 05/18/2019

**PEAK HOURS**

| | |
|---|---|
| AM | NONE |
| NOON | 01:15 PM - 02:15 PM |
| PM | NONE |

**COUNT PERIODS**

| | |
|---|---|
| AM | NONE |
| NOON | 11:00 AM - 03:00 PM |
| PM | NONE |

### S Randolph Ave — SOUTHBOUND

| | Left | Thru | Right | U-Turn | |
|---|---|---|---|---|---|
| AM | 0 | 0 | 0 | 0 | 0 AM |
| NOON | 237 | 72 | 379 | 0 | 711 NOON |
| PM | 0 | 0 | 0 | 0 | 0 PM |

### Imperial Hwy — EASTBOUND

| AM | NOON | PM | |
|---|---|---|---|
| 0 | 1798 | 0 | |
| 0 | 10 | 0 | 0 |
| 0 | 246 | 0 | 2 |
| 0 | 1354 | 0 | 3 |
| 0 | 30 | 0 | 0 |

### Imperial Hwy — WESTBOUND

| PM | NOON | AM | |
|---|---|---|---|
| 0 | 429 | 0 | 1 |
| 0 | 1487 | 0 | 3 |
| 0 | 89 | 0 | 1 |
| 0 | 15 | 0 | 0 |
| 0 | 1912 | 0 | |

### S Randolph Ave — NORTHBOUND

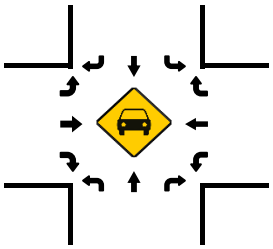
| | Left | Thru | Thru | Right | |
|---|---|---|---|---|---|
| PM | 0 | 0 | 0 | 0 | 0 PM |
| NOON | 191 | 0 | 64 | 36 | 164 NOON |
| AM | 0 | 0 | 0 | 0 | 0 AM |

| | EASTBOUND | WESTBOUND | NORTHBOUND |
|---|---|---|---|
| | 0.5 | 0.5 | 2 | 0 |
| | 0 | 1.5 | 1 | 0.5 |

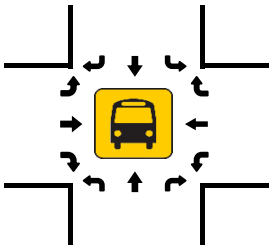
**CONTROL:** Signalized

| | AM | NOON | PM |
|---|---|---|---|
| TEV | 0 | 4612 | 0 |
| PHF | | 0.98 | |

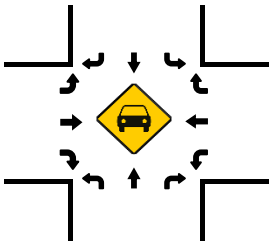
**Total Vehicles (AM)**



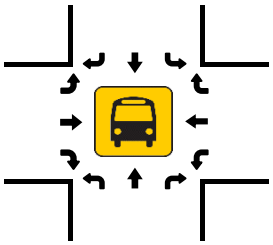
**Total Vehicles (AM)**



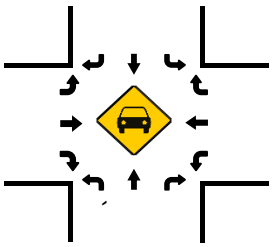
**Total Vehicles (NOON)**



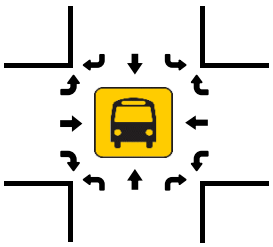
**Total Vehicles (NOON)**



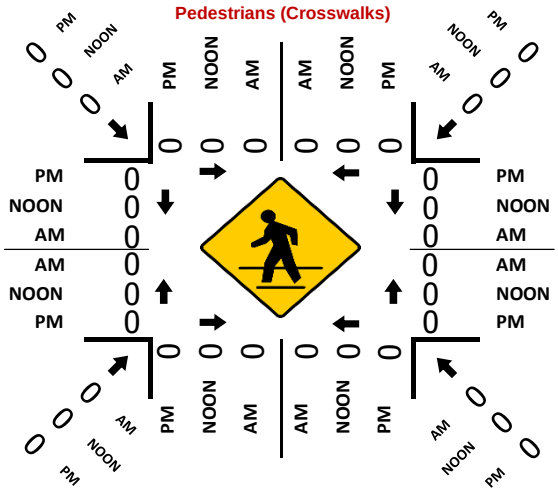
**Total Vehicles (PM)**



**Total Vehicles (PM)**



**Pedestrians (Crosswalks)**



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** S State College Blvd & Imperial Hwy
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01101-014
**Date:** 5/22/2019

**Total**

| NS/EW Streets: | S State College Blvd | | | | S State College Blvd | | | | Imperial Hwy | | | | Imperial Hwy | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 2 | 2 | 1 | 0 | 2 | 1.5 | 0.5 | 0 | 2 | 3.5 | 0.5 | 0 | 2 | 3 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 7:00 AM | 16 | 30 | 84 | 1 | 13 | 85 | 7 | 0 | 3 | 348 | 39 | 0 | 90 | 264 | 32 | 7 | 1019 |
| 7:15 AM | 11 | 31 | 99 | 0 | 12 | 90 | 5 | 0 | 6 | 352 | 31 | 1 | 74 | 353 | 24 | 9 | 1098 |
| 7:30 AM | 20 | 16 | 90 | 0 | 17 | 81 | 7 | 0 | 7 | 402 | 42 | 0 | 93 | 380 | 22 | 5 | 1182 |
| 7:45 AM | 33 | 34 | 98 | 0 | 17 | 76 | 5 | 0 | 7 | 347 | 48 | 0 | 111 | 397 | 34 | 6 | 1213 |
| 8:00 AM | 27 | 46 | 91 | 1 | 28 | 76 | 8 | 0 | 10 | 345 | 42 | 0 | 107 | 315 | 37 | 5 | 1138 |
| 8:15 AM | 21 | 32 | 89 | 3 | 23 | 62 | 11 | 0 | 7 | 375 | 26 | 0 | 75 | 292 | 35 | 5 | 1056 |
| 8:30 AM | 40 | 47 | 98 | 0 | 36 | 69 | 6 | 0 | 17 | 334 | 38 | 0 | 64 | 284 | 62 | 8 | 1103 |
| 8:45 AM | 39 | 34 | 84 | 0 | 20 | 67 | 8 | 0 | 8 | 259 | 29 | 1 | 78 | 362 | 48 | 7 | 1044 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 207 | 270 | 733 | 5 | 166 | 606 | 57 | 0 | 65 | 2762 | 295 | 2 | 692 | 2647 | 294 | 52 | 8853 |
| **APPROACH %'s :** | 17.04% | 22.22% | 60.33% | 0.41% | 20.02% | 73.10% | 6.88% | 0.00% | 2.08% | 88.41% | 9.44% | 0.06% | 18.78% | 71.83% | 7.98% | 1.41% | |
| **PEAK HR :** | 07:15 AM - 08:15 AM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 91 | 127 | 378 | 1 | 74 | 323 | 25 | 0 | 30 | 1446 | 163 | 1 | 385 | 1445 | 117 | 25 | 4631 |
| **PEAK HR FACTOR :** | 0.689 | 0.690 | 0.955 | 0.250 | 0.661 | 0.897 | 0.781 | 0.000 | 0.750 | 0.899 | 0.849 | 0.250 | 0.867 | 0.910 | 0.791 | 0.694 | 0.954 |
| | 0.905 | | | | 0.942 | | | | 0.909 | | | | 0.900 | | | | |

| PM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 2 | 1 | 0 | 2 | 1.5 | 0.5 | 0 | 2 | 3.5 | 0.5 | 0 | 2 | 3 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 4:00 PM | 41 | 69 | 45 | 3 | 71 | 68 | 19 | 0 | 13 | 378 | 24 | 0 | 92 | 398 | 125 | 11 | 1357 |
| 4:15 PM | 44 | 96 | 73 | 3 | 65 | 50 | 18 | 0 | 16 | 365 | 34 | 0 | 86 | 403 | 101 | 5 | 1359 |
| 4:30 PM | 65 | 105 | 58 | 1 | 74 | 60 | 16 | 0 | 22 | 380 | 40 | 1 | 83 | 401 | 82 | 8 | 1396 |
| 4:45 PM | 60 | 114 | 65 | 0 | 86 | 71 | 24 | 0 | 26 | 346 | 32 | 0 | 95 | 443 | 87 | 4 | 1453 |
| 5:00 PM | 60 | 109 | 77 | 0 | 65 | 53 | 25 | 0 | 25 | 415 | 26 | 0 | 102 | 449 | 102 | 9 | 1517 |
| 5:15 PM | 99 | 133 | 89 | 2 | 104 | 63 | 23 | 0 | 22 | 454 | 11 | 0 | 85 | 428 | 120 | 9 | 1642 |
| 5:30 PM | 91 | 129 | 75 | 0 | 91 | 69 | 12 | 0 | 23 | 397 | 22 | 0 | 78 | 454 | 66 | 6 | 1513 |
| 5:45 PM | 82 | 128 | 87 | 0 | 100 | 66 | 29 | 0 | 32 | 409 | 28 | 0 | 118 | 371 | 121 | 11 | 1582 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 542 | 883 | 569 | 9 | 656 | 500 | 166 | 0 | 179 | 3144 | 217 | 1 | 739 | 3347 | 804 | 63 | 11819 |
| **APPROACH %'s :** | 27.06% | 44.08% | 28.41% | 0.45% | 49.62% | 37.82% | 12.56% | 0.00% | 5.06% | 88.79% | 6.13% | 0.03% | 14.92% | 67.58% | 16.23% | 1.27% | |
| **PEAK HR :** | 05:00 PM - 06:00 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 332 | 499 | 328 | 2 | 360 | 251 | 89 | 0 | 102 | 1675 | 87 | 0 | 383 | 1702 | 409 | 35 | 6254 |
| **PEAK HR FACTOR :** | 0.838 | 0.938 | 0.921 | 0.250 | 0.865 | 0.909 | 0.767 | 0.000 | 0.797 | 0.922 | 0.777 | 0.000 | 0.811 | 0.937 | 0.845 | 0.795 | 0.952 |
| | 0.899 | | | | 0.897 | | | | 0.957 | | | | 0.955 | | | | |

Prepared by National Data & Surveying Services

# S State College Blvd & Imperial Hwy

## Peak Hour Turning Movement Count

**ID:** 19-01101-014
**City:** Brea

**Day:** Wednesday
**Date:** 05/22/2019

| PEAK HOURS | |
|---|---|
| AM | 07:15 AM - 08:15 AM |
| NOON | NONE |
| PM | 05:00 PM - 06:00 PM |

| COUNT PERIODS | |
|---|---|
| AM | 07:00 AM - 09:00 AM |
| NOON | NONE |
| PM | 04:00 PM - 06:00 PM |

### S State College Blvd — SOUTHBOUND

| | Left | Thru | Right | U-Turn | |
|---|---|---|---|---|---|
| AM | 25 | 323 | 74 | 0 | 274 AM |
| NOON | 0 | 0 | 0 | 0 | 0 NOON |
| PM | 89 | 251 | 360 | 0 | 1010 PM |
| | 0.5 | 1.5 | 2 | 0 | |

### EASTBOUND — Imperial Hwy

| AM | NOON | PM | |
|---|---|---|---|
| 1562 | 0 | 2123 | ⇦ |
| 1 | 0 | 0 | 0 |
| 30 | 0 | 102 | 2 |
| 1446 | 0 | 1675 | 3.5 |
| 163 | 0 | 87 | 0.5 |

### WESTBOUND — Imperial Hwy

| | PM | NOON | AM |
|---|---|---|---|
| 1 | 409 | 0 | 117 |
| 3 | 1702 | 0 | 1445 |
| 2 | 383 | 0 | 385 |
| 0 | 35 | 0 | 25 |
| ⇨ | 2398 | 0 | 1923 |

### CONTROL

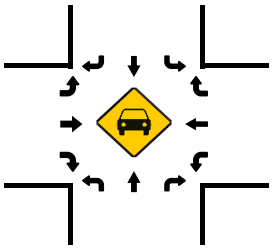
Signalized

| | | | |
|---|---|---|---|
| TEV | 4631 AM | 0 NOON | 6254 PM |
| PHF | 0.95 | | 0.95 |

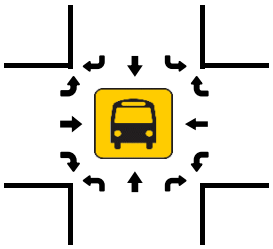
### S State College Blvd — NORTHBOUND

| | Left | Thru | Thru | Right | |
|---|---|---|---|---|---|
| PM | 723 | 2 | 332 | 499 | 328 PM |
| NOON | 0 | 0 | 0 | 0 | 0 NOON |
| AM | 872 | 1 | 91 | 127 | 378 AM |
| | 0 | 2 | 2 | 1 | |

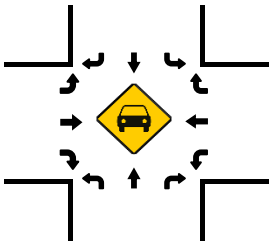
Total Vehicles (AM)



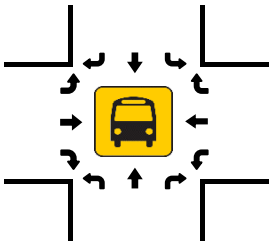
Total Vehicles (AM)



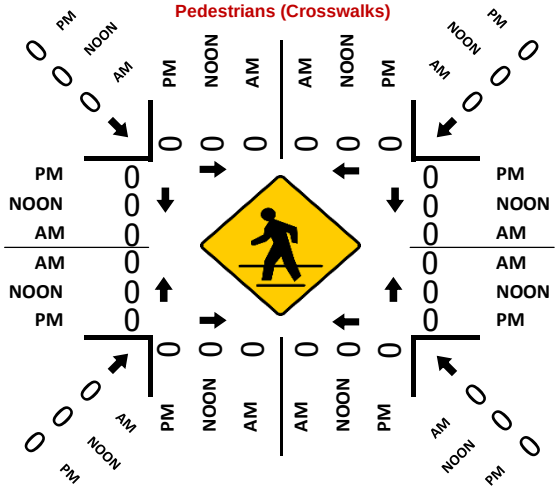
Total Vehicles (NOON)



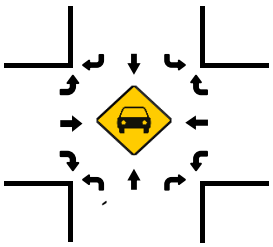
Total Vehicles (NOON)



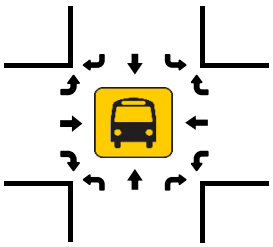
Pedestrians (Crosswalks)




Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** S State College Blvd & Imperial Hwy
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01101-014
**Date:** 5/18/2019

**Total**

| NS/EW Streets: | S State College Blvd | | | | S State College Blvd | | | | Imperial Hwy | | | | Imperial Hwy | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NOON** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 2 | 2 | 1 | 0 | 2 | 1.5 | 0.5 | 0 | 2 | 3.5 | 0.5 | 0 | 2 | 3 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 11:00 AM | 48 | 68 | 94 | 1 | 86 | 39 | 32 | 0 | 29 | 362 | 27 | 1 | 97 | 368 | 178 | 10 | 1440 |
| 11:15 AM | 53 | 89 | 119 | 3 | 79 | 63 | 24 | 0 | 21 | 375 | 32 | 2 | 94 | 365 | 212 | 16 | 1547 |
| 11:30 AM | 64 | 105 | 128 | 3 | 88 | 44 | 44 | 0 | 40 | 368 | 37 | 2 | 98 | 385 | 165 | 13 | 1584 |
| 11:45 AM | 59 | 110 | 146 | 3 | 105 | 65 | 31 | 0 | 22 | 330 | 31 | 0 | 137 | 440 | 241 | 24 | 1744 |
| 12:00 PM | 70 | 106 | 137 | 1 | 120 | 78 | 45 | 0 | 29 | 349 | 50 | 1 | 129 | 399 | 183 | 24 | 1721 |
| 12:15 PM | 54 | 110 | 138 | 4 | 124 | 93 | 38 | 0 | 41 | 359 | 39 | 0 | 124 | 414 | 200 | 17 | 1755 |
| 12:30 PM | 56 | 133 | 114 | 5 | 138 | 107 | 55 | 0 | 33 | 382 | 48 | 0 | 135 | 426 | 203 | 13 | 1848 |
| 12:45 PM | 55 | 94 | 99 | 1 | 129 | 111 | 41 | 0 | 37 | 340 | 44 | 1 | 108 | 382 | 185 | 19 | 1646 |
| 1:00 PM | 47 | 84 | 93 | 4 | 123 | 78 | 38 | 0 | 29 | 396 | 36 | 0 | 139 | 432 | 198 | 17 | 1714 |
| 1:15 PM | 47 | 67 | 88 | 1 | 138 | 99 | 40 | 0 | 36 | 394 | 42 | 1 | 125 | 403 | 217 | 13 | 1711 |
| 1:30 PM | 58 | 82 | 99 | 3 | 147 | 90 | 46 | 0 | 32 | 403 | 39 | 0 | 129 | 392 | 189 | 13 | 1722 |
| 1:45 PM | 55 | 77 | 101 | 1 | 150 | 94 | 42 | 0 | 36 | 420 | 43 | 1 | 145 | 423 | 188 | 17 | 1793 |
| 2:00 PM | 39 | 76 | 92 | 1 | 155 | 110 | 37 | 0 | 32 | 416 | 41 | 3 | 112 | 414 | 188 | 23 | 1739 |
| 2:15 PM | 43 | 73 | 86 | 0 | 118 | 89 | 53 | 0 | 34 | 373 | 34 | 0 | 115 | 368 | 168 | 18 | 1572 |
| 2:30 PM | 43 | 77 | 83 | 2 | 156 | 99 | 46 | 0 | 23 | 375 | 40 | 0 | 117 | 392 | 179 | 14 | 1646 |
| 2:45 PM | 37 | 68 | 79 | 2 | 145 | 108 | 41 | 0 | 33 | 375 | 34 | 0 | 112 | 388 | 188 | 19 | 1629 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 828 | 1419 | 1696 | 35 | 2001 | 1367 | 653 | 0 | 507 | 6017 | 617 | 12 | 1916 | 6391 | 3082 | 270 | 26811 |
| **APPROACH %'s :** | 20.81% | 35.67% | 42.63% | 0.88% | 49.76% | 34.00% | 16.24% | 0.00% | 7.09% | 84.12% | 8.63% | 0.17% | 16.43% | 54.82% | 26.43% | 2.32% | |
| **PEAK HR :** | 11:45 AM - 12:45 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 239 | 459 | 535 | 13 | 487 | 343 | 169 | 0 | 125 | 1420 | 168 | 1 | 525 | 1679 | 827 | 78 | 7068 |
| **PEAK HR FACTOR :** | 0.854 | 0.863 | 0.916 | 0.650 | 0.882 | 0.801 | 0.768 | 0.000 | 0.762 | 0.929 | 0.840 | 0.250 | 0.958 | 0.954 | 0.858 | 0.813 | 0.956 |
| | 0.980 | | | | 0.833 | | | | 0.925 | | | | 0.923 | | | | |

Prepared by National Data & Surveying Services

# S State College Blvd & Imperial Hwy

## Peak Hour Turning Movement Count

**ID:** 19-01101-014
**City:** Brea

**Day:** Saturday
**Date:** 05/18/2019

**S State College Blvd**

**SOUTHBOUND**

| PEAK HOURS | COUNT PERIODS |
|---|---|
| NONE | NONE |
| 11:45 AM - 12:45 PM | 11:00 AM - 03:00 PM |
| NONE | NONE |

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 0 | 0 | 0 | 0 | 0 | AM |
| NOON | 169 | 343 | 487 | 0 | 1411 | NOON |
| PM | 0 | 0 | 0 | 0 | 0 | PM |

**EASTBOUND** (Imperial Hwy)

| AM | NOON | PM | |
|---|---|---|---|
| 0 | 2088 | 0 | |
| 0 | 1 | 0 | 0 |
| 0 | 125 | 0 | 2 |
| 0 | 1420 | 0 | 3.5 |
| 0 | 168 | 0 | 0.5 |

**WESTBOUND** (Imperial Hwy)

| | PM | NOON | AM |
|---|---|---|---|
| 1 | 0 | 827 | 0 |
| 3 | 0 | 1679 | 0 |
| 2 | 0 | 525 | 0 |
| 0 | 0 | 78 | 0 |
| | 0 | 2520 | 0 |

0.5 1.5 2 0

0 2 2 1

**CONTROL**

Signalized

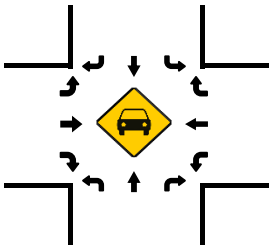
| | AM | NOON | PM |
|---|---|---|---|
| TEV | 0 | 7068 | 0 |
| PHF | | 0.96 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| PM | 0 | 0 | 0 | 0 | 0 | PM |
| NOON | 1049 | 13 | 239 | 459 | 535 | NOON |
| AM | 0 | 0 | 0 | 0 | 0 | AM |

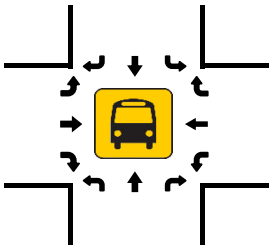
**NORTHBOUND**

**S State College Blvd**

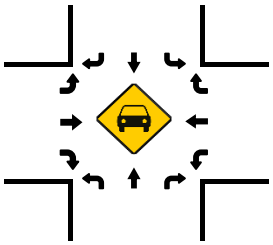
Total Vehicles (AM)



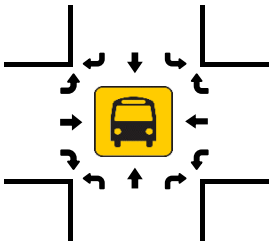
Total Vehicles (AM)



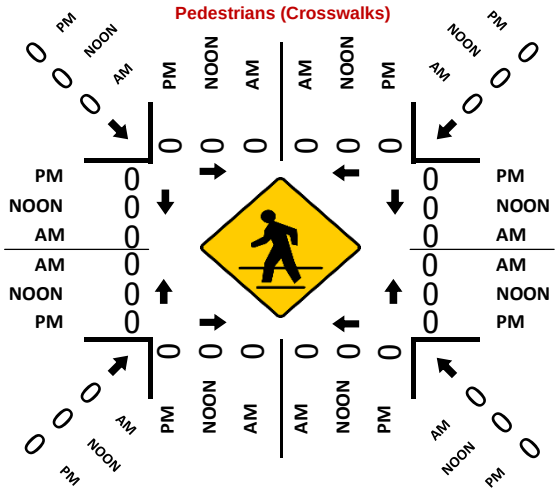
Total Vehicles (NOON)



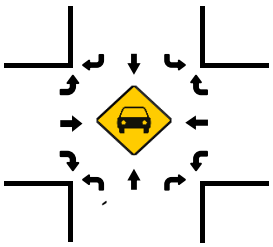
Total Vehicles (NOON)



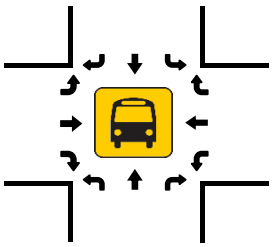
Pedestrians (Crosswalks)




Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** SR-57 SB Ramps & Imperial Hwy
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01101-015
**Date:** 5/22/2019

**Total**

| NS/EW Streets: | SR-57 SB Ramps | | | | SR-57 SB Ramps | | | | Imperial Hwy | | | | Imperial Hwy | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 0 | 0 | 0 | 0 | 1.5 | 0 | 1.5 | 0 | 0 | 3 | 1 | 0 | 0 | 3 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 7:00 AM | 0 | 0 | 0 | 0 | 145 | 0 | 89 | 0 | 0 | 316 | 142 | 0 | 0 | 305 | 30 | 0 | 1027 |
| 7:15 AM | 0 | 0 | 0 | 0 | 145 | 0 | 107 | 0 | 0 | 343 | 138 | 0 | 0 | 363 | 35 | 0 | 1131 |
| 7:30 AM | 0 | 0 | 0 | 0 | 164 | 0 | 115 | 0 | 0 | 367 | 158 | 0 | 0 | 417 | 43 | 0 | 1264 |
| 7:45 AM | 0 | 0 | 0 | 0 | 123 | 0 | 128 | 0 | 0 | 312 | 155 | 0 | 0 | 391 | 35 | 0 | 1144 |
| 8:00 AM | 0 | 0 | 0 | 0 | 115 | 0 | 86 | 0 | 0 | 317 | 156 | 0 | 0 | 387 | 58 | 0 | 1119 |
| 8:15 AM | 0 | 0 | 0 | 0 | 102 | 0 | 83 | 0 | 0 | 328 | 162 | 0 | 0 | 328 | 47 | 0 | 1050 |
| 8:30 AM | 0 | 0 | 0 | 0 | 89 | 0 | 80 | 0 | 0 | 326 | 130 | 0 | 0 | 332 | 64 | 0 | 1021 |
| 8:45 AM | 0 | 0 | 0 | 0 | 102 | 0 | 99 | 0 | 0 | 284 | 105 | 0 | 0 | 394 | 61 | 0 | 1045 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 0 | 0 | 0 | 0 | 985 | 0 | 787 | 0 | 0 | 2593 | 1146 | 0 | 0 | 2917 | 373 | 0 | 8801 |
| **APPROACH %'s :** | | | | | 55.59% | 0.00% | 44.41% | 0.00% | 0.00% | 69.35% | 30.65% | 0.00% | 0.00% | 88.66% | 11.34% | 0.00% | |
| **PEAK HR :** | 07:15 AM - 08:15 AM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 0 | 0 | 0 | 0 | 547 | 0 | 436 | 0 | 0 | 1339 | 607 | 0 | 0 | 1558 | 171 | 0 | 4658 |
| **PEAK HR FACTOR :** | 0.000 | 0.000 | 0.000 | 0.000 | 0.834 | 0.000 | 0.852 | 0.000 | 0.000 | 0.912 | 0.960 | 0.000 | 0.000 | 0.934 | 0.737 | 0.000 | 0.921 |
| | | | | | 0.881 | | | | 0.927 | | | | 0.940 | | | | |

| PM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | 1.5 | 0 | 1.5 | 0 | 0 | 3 | 1 | 0 | 0 | 3 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 4:00 PM | 0 | 0 | 0 | 0 | 131 | 0 | 102 | 0 | 0 | 340 | 161 | 0 | 0 | 527 | 111 | 0 | 1372 |
| 4:15 PM | 0 | 0 | 0 | 0 | 142 | 0 | 108 | 0 | 0 | 385 | 134 | 0 | 0 | 459 | 104 | 0 | 1332 |
| 4:30 PM | 0 | 0 | 0 | 0 | 102 | 0 | 97 | 0 | 0 | 343 | 169 | 0 | 0 | 502 | 101 | 0 | 1314 |
| 4:45 PM | 0 | 0 | 0 | 0 | 129 | 0 | 117 | 0 | 0 | 327 | 175 | 0 | 0 | 522 | 137 | 0 | 1407 |
| 5:00 PM | 0 | 0 | 0 | 0 | 150 | 0 | 135 | 0 | 0 | 345 | 248 | 0 | 0 | 517 | 100 | 0 | 1495 |
| 5:15 PM | 0 | 0 | 0 | 0 | 169 | 0 | 127 | 0 | 0 | 411 | 213 | 0 | 0 | 496 | 86 | 0 | 1502 |
| 5:30 PM | 0 | 0 | 0 | 0 | 161 | 0 | 120 | 0 | 0 | 396 | 194 | 0 | 0 | 507 | 82 | 0 | 1460 |
| 5:45 PM | 0 | 0 | 0 | 0 | 140 | 0 | 110 | 0 | 0 | 384 | 190 | 0 | 0 | 518 | 100 | 0 | 1442 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 0 | 0 | 0 | 0 | 1124 | 0 | 916 | 0 | 0 | 2931 | 1484 | 0 | 0 | 4048 | 821 | 0 | 11324 |
| **APPROACH %'s :** | | | | | 55.10% | 0.00% | 44.90% | 0.00% | 0.00% | 66.39% | 33.61% | 0.00% | 0.00% | 83.14% | 16.86% | 0.00% | |
| **PEAK HR :** | 05:00 PM - 06:00 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 0 | 0 | 0 | 0 | 620 | 0 | 492 | 0 | 0 | 1536 | 845 | 0 | 0 | 2038 | 368 | 0 | 5899 |
| **PEAK HR FACTOR :** | 0.000 | 0.000 | 0.000 | 0.000 | 0.917 | 0.000 | 0.911 | 0.000 | 0.000 | 0.934 | 0.852 | 0.000 | 0.000 | 0.984 | 0.920 | 0.000 | 0.982 |
| | | | | | 0.939 | | | | 0.954 | | | | 0.973 | | | | |

Prepared by National Data & Surveying Services

# SR-57 SB Ramps & Imperial Hwy

## Peak Hour Turning Movement Count

**ID:** 19-01101-015
**City:** Brea

**Day:** Wednesday
**Date:** 05/22/2019

| PEAK HOURS | COUNT PERIODS |
|---|---|
| 07:15 AM - 08:15 AM | 07:00 AM - 09:00 AM |
| NONE | NONE |
| 05:00 PM - 06:00 PM | 04:00 PM - 06:00 PM |

### SR-57 SB Ramps — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 436 | 0 | 547 | 0 | 171 | AM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| PM | 492 | 0 | 620 | 0 | 368 | PM |
| | 1.5 | 0 | 1.5 | 0 | | |

### EASTBOUND — Imperial Hwy

| AM | NOON | PM | |
|---|---|---|---|
| 1994 | 0 | 2530 | ⇦ |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 1339 | 0 | 1536 | 3 |
| 607 | 0 | 845 | 1 |
| AM | NOON | PM | |

### WESTBOUND — Imperial Hwy

| PM | NOON | AM | |
|---|---|---|---|
| 368 | 0 | 171 | 1 |
| 2038 | 0 | 1558 | 3 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 2156 | 0 | 1886 | ⇨ |
| PM | NOON | AM | |

### CONTROL

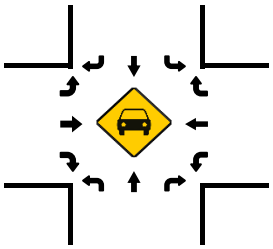
Signalized

| | | | |
|---|---|---|---|
| TEV | 4658 | 0 | 5899 |
| | AM | NOON | PM |
| PHF | 0.92 | | 0.98 |

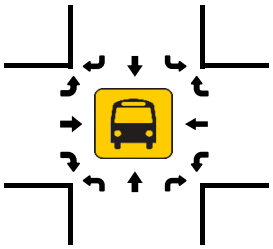
### SR-57 SB Ramps — NORTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | | |
| PM | 845 | 0 | 0 | 0 | 0 | PM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| AM | 607 | 0 | 0 | 0 | 0 | AM |

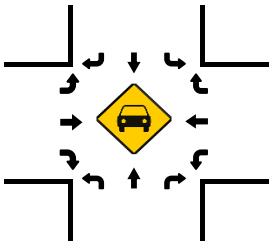
Total Vehicles (AM)



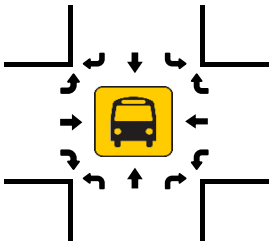
Total Vehicles (AM)



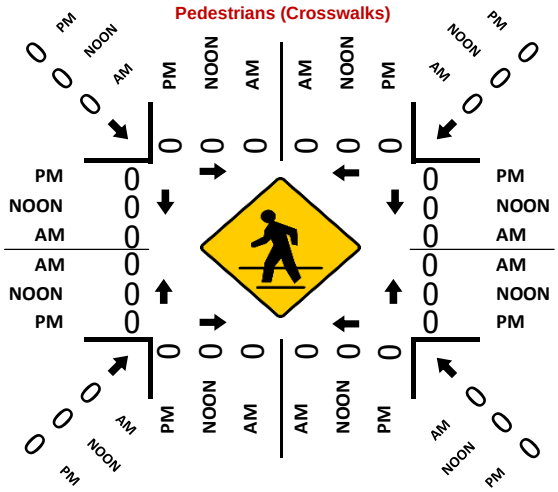
Total Vehicles (NOON)



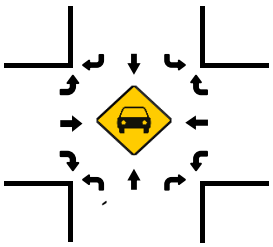
Total Vehicles (NOON)



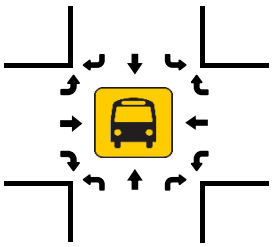
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** SR-57 SB Ramps & Imperial Hwy
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01101-015
**Date:** 5/18/2019

**Total**

| NS/EW Streets: | SR-57 SB Ramps | | | | SR-57 SB Ramps | | | | Imperial Hwy | | | | Imperial Hwy | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NOON** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 0 | 0 | 0 | 0 | 1.5 | 0 | 1.5 | 0 | 0 | 3 | 1 | 0 | 0 | 3 | 1 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 11:00 AM | 0 | 0 | 0 | 0 | 110 | 0 | 137 | 0 | 0 | 364 | 186 | 0 | 0 | 527 | 88 | 0 | 1412 |
| 11:15 AM | 0 | 0 | 0 | 0 | 125 | 0 | 160 | 0 | 0 | 384 | 201 | 0 | 0 | 517 | 96 | 0 | 1483 |
| 11:30 AM | 0 | 0 | 0 | 0 | 112 | 0 | 152 | 0 | 0 | 428 | 185 | 0 | 0 | 534 | 94 | 0 | 1505 |
| 11:45 AM | 0 | 0 | 0 | 0 | 156 | 0 | 202 | 0 | 0 | 427 | 203 | 0 | 0 | 630 | 87 | 0 | 1705 |
| 12:00 PM | 0 | 0 | 0 | 0 | 110 | 0 | 188 | 0 | 0 | 413 | 200 | 0 | 0 | 552 | 41 | 0 | 1504 |
| 12:15 PM | 0 | 0 | 0 | 0 | 155 | 0 | 208 | 0 | 0 | 414 | 214 | 0 | 0 | 538 | 73 | 0 | 1602 |
| 12:30 PM | 0 | 0 | 0 | 0 | 181 | 0 | 165 | 0 | 0 | 460 | 200 | 0 | 0 | 609 | 71 | 0 | 1686 |
| 12:45 PM | 0 | 0 | 0 | 0 | 166 | 0 | 175 | 0 | 0 | 447 | 185 | 0 | 0 | 544 | 64 | 0 | 1581 |
| 1:00 PM | 0 | 0 | 0 | 0 | 147 | 0 | 187 | 0 | 0 | 414 | 196 | 0 | 0 | 577 | 83 | 0 | 1604 |
| 1:15 PM | 0 | 0 | 0 | 0 | 143 | 0 | 180 | 0 | 0 | 435 | 219 | 0 | 0 | 572 | 62 | 0 | 1611 |
| 1:30 PM | 0 | 0 | 0 | 0 | 133 | 0 | 190 | 0 | 0 | 440 | 211 | 0 | 0 | 565 | 96 | 0 | 1635 |
| 1:45 PM | 0 | 0 | 0 | 0 | 132 | 0 | 167 | 0 | 0 | 440 | 257 | 0 | 0 | 585 | 91 | 0 | 1672 |
| 2:00 PM | 0 | 0 | 0 | 0 | 102 | 0 | 147 | 0 | 0 | 461 | 258 | 0 | 0 | 572 | 87 | 0 | 1627 |
| 2:15 PM | 0 | 0 | 0 | 0 | 99 | 0 | 138 | 0 | 0 | 403 | 211 | 0 | 0 | 557 | 76 | 0 | 1484 |
| 2:30 PM | 0 | 0 | 0 | 0 | 102 | 0 | 142 | 0 | 0 | 416 | 237 | 0 | 0 | 563 | 97 | 0 | 1557 |
| 2:45 PM | 0 | 0 | 0 | 0 | 109 | 0 | 145 | 0 | 0 | 417 | 224 | 0 | 0 | 534 | 81 | 0 | 1510 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 0 | 0 | 0 | 0 | 2082 | 0 | 2683 | 0 | 0 | 6763 | 3387 | 0 | 0 | 8976 | 1287 | 0 | 25178 |
| **APPROACH %'s :** | | | | | 43.69% | 0.00% | 56.31% | 0.00% | 0.00% | 66.63% | 33.37% | 0.00% | 0.00% | 87.46% | 12.54% | 0.00% | |
| **PEAK HR :** | **01:15 PM - 02:15 PM** | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 0 | 0 | 0 | 0 | 510 | 0 | 684 | 0 | 0 | 1776 | 945 | 0 | 0 | 2294 | 336 | 0 | 6545 |
| **PEAK HR FACTOR :** | 0.000 | 0.000 | 0.000 | 0.000 | 0.892 | 0.000 | 0.900 | 0.000 | 0.000 | 0.963 | 0.916 | 0.000 | 0.000 | 0.980 | 0.875 | 0.000 | 0.979 |
| | | | | | | 0.924 | | | | 0.946 | | | | 0.973 | | | |

Prepared by National Data & Surveying Services

# SR-57 SB Ramps & Imperial Hwy

## Peak Hour Turning Movement Count

**ID:** 19-01101-015
**City:** Brea

**Day:** Saturday
**Date:** 05/18/2019

| PEAK HOURS | COUNT PERIODS |
|---|---|
| NONE | NONE |
| 01:15 PM - 02:15 PM | 11:00 AM - 03:00 PM |
| NONE | NONE |

### SR-57 SB Ramps — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 0 | 0 | 0 | 0 | 0 | AM |
| NOON | 684 | 0 | 510 | 0 | 336 | NOON |
| PM | 0 | 0 | 0 | 0 | 0 | PM |

1.5 0 1.5 0

### EASTBOUND (Imperial Hwy)

| AM | NOON | PM | |
|---|---|---|---|
| 0 | 2978 | 0 | |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 1776 | 0 | 3 |
| 0 | 945 | 0 | 1 |
| AM | NOON | PM | |

### WESTBOUND (Imperial Hwy)

| | PM | NOON | AM |
|---|---|---|---|
| 1 | 0 | 336 | 0 |
| 3 | 0 | 2294 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| | 0 | 2286 | 0 |
| | PM | NOON | AM |

### CONTROL

Signalized

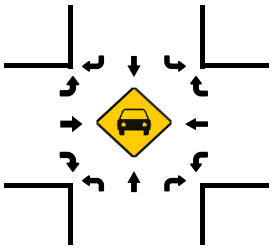
| | AM | NOON | PM |
|---|---|---|---|
| TEV | 0 | 6545 | 0 |
| PHF | | 0.98 | |

0 0 0 0

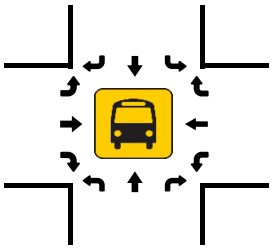
### NORTHBOUND — SR-57 SB Ramps

| | | | | | | |
|---|---|---|---|---|---|---|
| PM | 0 | 0 | 0 | 0 | 0 | PM |
| NOON | 945 | 0 | 0 | 0 | 0 | NOON |
| AM | 0 | 0 | 0 | 0 | 0 | AM |

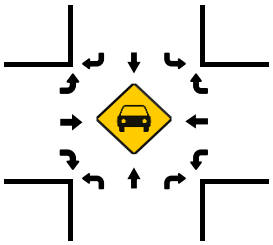
Total Vehicles (AM)



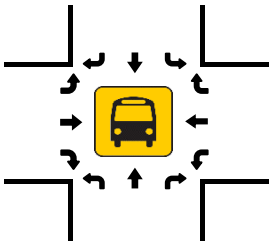
Total Vehicles (AM)



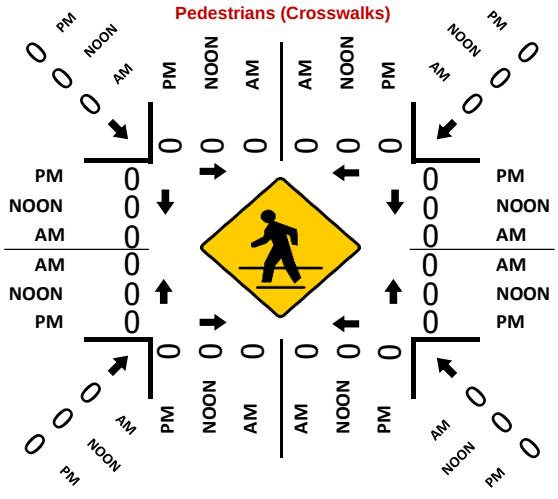
Total Vehicles (NOON)



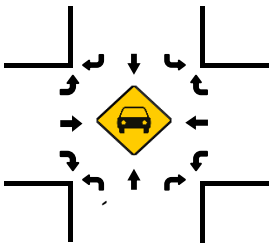
Total Vehicles (NOON)



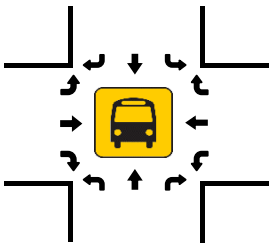
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** SR-57 NB Ramps & Imperial Hwy
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01101-016
**Date:** 5/22/2019

**Total**

| NS/EW Streets: | SR-57 NB Ramps | | | | | SR-57 NB Ramps | | | | | Imperial Hwy | | | | | Imperial Hwy | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM** | NORTHBOUND | | | | | SOUTHBOUND | | | | | EASTBOUND | | | | | WESTBOUND | | | | | SOUTHBOUND2 | | | | | |
| | 2.3 | 0.3 | 1.3 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 3 | 1 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | NL | NT | NR | NU | NT2 | SL | ST | SR | SU | SU2 | EL | ET | ER | EU | EL2 | WL | WT | WR | WU | WR2 | S2U | S2L2 | S2T2 | S2R2 | S2U2 | TOTAL |
| 7:00 AM | 152 | 46 | 165 | 0 | 0 | 0 | 0 | 14 | 0 | 6 | 23 | 318 | 132 | 0 | 0 | 0 | 167 | 3 | 0 | 125 | 0 | 0 | 0 | 0 | 0 | 1151 |
| 7:15 AM | 207 | 50 | 192 | 0 | 0 | 0 | 0 | 16 | 0 | 17 | 29 | 312 | 133 | 0 | 0 | 0 | 177 | 2 | 0 | 105 | 0 | 0 | 0 | 0 | 0 | 1240 |
| 7:30 AM | 245 | 50 | 173 | 0 | 0 | 0 | 0 | 12 | 0 | 9 | 34 | 366 | 133 | 0 | 0 | 0 | 203 | 3 | 0 | 119 | 0 | 0 | 0 | 0 | 0 | 1347 |
| 7:45 AM | 174 | 43 | 204 | 0 | 1 | 0 | 0 | 12 | 0 | 7 | 65 | 264 | 122 | 0 | 0 | 0 | 240 | 1 | 0 | 111 | 0 | 0 | 0 | 0 | 0 | 1244 |
| 8:00 AM | 160 | 24 | 177 | 0 | 0 | 0 | 0 | 12 | 0 | 5 | 24 | 275 | 117 | 0 | 0 | 0 | 253 | 0 | 0 | 120 | 0 | 0 | 0 | 0 | 0 | 1167 |
| 8:15 AM | 187 | 24 | 187 | 0 | 1 | 0 | 0 | 12 | 0 | 13 | 15 | 302 | 109 | 0 | 0 | 0 | 200 | 3 | 0 | 124 | 0 | 0 | 0 | 0 | 0 | 1177 |
| 8:30 AM | 171 | 34 | 212 | 0 | 1 | 0 | 0 | 18 | 0 | 5 | 29 | 274 | 116 | 0 | 0 | 0 | 203 | 3 | 0 | 108 | 0 | 0 | 0 | 0 | 0 | 1174 |
| 8:45 AM | 223 | 28 | 203 | 0 | 0 | 0 | 0 | 15 | 0 | 9 | 39 | 242 | 97 | 0 | 0 | 0 | 226 | 4 | 0 | 93 | 0 | 0 | 0 | 0 | 0 | 1179 |
| | NL | NT | NR | NU | NT2 | SL | ST | SR | SU | SU2 | EL | ET | ER | EU | EL2 | WL | WT | WR | WU | WR2 | S2U | S2L2 | S2T2 | S2R2 | S2U2 | TOTAL |
| **TOTAL VOLUMES :** | 1519 | 299 | 1513 | 0 | 3 | 0 | 0 | 111 | 0 | 71 | 258 | 2353 | 959 | 0 | 0 | 0 | 1669 | 19 | 0 | 905 | 0 | 0 | 0 | 0 | 0 | 9679 |
| **APPROACH %'s :** | 45.56% | 8.97% | 45.38% | 0.00% | 0.09% | 0.00% | 0.00% | 60.99% | 0.00% | 39.01% | 7.23% | 65.91% | 26.86% | 0.00% | 0.00% | 0.00% | 64.37% | 0.73% | 0.00% | 34.90% | | | | | | |
| **PEAK HR :** | 07:15 AM - 08:15 AM | | | | | | | | | | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 786 | 167 | 746 | 0 | 1 | 0 | 0 | 52 | 0 | 38 | 152 | 1217 | 505 | 0 | 0 | 0 | 873 | 6 | 0 | 455 | 0 | 0 | 0 | 0 | 0 | 4998 |
| **PEAK HR FACTOR :** | 0.802 | 0.835 | 0.914 | 0.000 | 0.250 | 0.000 | 0.000 | 0.813 | 0.000 | 0.559 | 0.585 | 0.831 | 0.949 | 0.000 | 0.000 | 0.000 | 0.863 | 0.500 | 0.000 | 0.948 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.928 |
| | | | 0.908 | | | | | 0.682 | | | | | 0.879 | | | | | 0.894 | | | | | | | | |

| **PM** | NORTHBOUND | | | | | SOUTHBOUND | | | | | EASTBOUND | | | | | WESTBOUND | | | | | SOUTHBOUND2 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2.3 | 0.3 | 1.3 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 3 | 1 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | NL | NT | NR | NU | NT2 | SL | ST | SR | SU | SU2 | EL | ET | ER | EU | EL2 | WL | WT | WR | WU | WR2 | S2U | S2L2 | S2T2 | S2R2 | S2U2 | TOTAL |
| 4:00 PM | 258 | 15 | 128 | 0 | 1 | 0 | 0 | 51 | 0 | 8 | 38 | 392 | 44 | 0 | 0 | 0 | 327 | 9 | 0 | 88 | 0 | 0 | 0 | 0 | 0 | 1359 |
| 4:15 PM | 195 | 12 | 112 | 0 | 2 | 0 | 0 | 30 | 0 | 14 | 37 | 417 | 70 | 0 | 0 | 0 | 345 | 14 | 0 | 133 | 0 | 0 | 0 | 0 | 0 | 1381 |
| 4:30 PM | 188 | 21 | 117 | 0 | 1 | 0 | 0 | 39 | 0 | 13 | 48 | 358 | 63 | 0 | 0 | 0 | 371 | 6 | 0 | 149 | 0 | 0 | 0 | 0 | 0 | 1374 |
| 4:45 PM | 215 | 26 | 120 | 0 | 3 | 0 | 0 | 51 | 0 | 17 | 45 | 327 | 55 | 0 | 0 | 0 | 393 | 11 | 0 | 174 | 0 | 0 | 0 | 0 | 0 | 1437 |
| 5:00 PM | 200 | 6 | 125 | 0 | 6 | 0 | 0 | 51 | 0 | 15 | 40 | 394 | 79 | 0 | 0 | 0 | 366 | 8 | 0 | 176 | 0 | 0 | 0 | 0 | 0 | 1466 |
| 5:15 PM | 205 | 15 | 84 | 0 | 6 | 0 | 0 | 37 | 0 | 18 | 43 | 425 | 99 | 0 | 0 | 0 | 332 | 12 | 0 | 201 | 0 | 0 | 0 | 0 | 0 | 1477 |
| 5:30 PM | 208 | 16 | 82 | 0 | 4 | 0 | 0 | 59 | 0 | 10 | 47 | 422 | 80 | 0 | 0 | 0 | 347 | 8 | 0 | 180 | 0 | 0 | 0 | 0 | 0 | 1463 |
| 5:45 PM | 200 | 22 | 98 | 0 | 2 | 0 | 0 | 41 | 0 | 13 | 52 | 396 | 80 | 0 | 0 | 0 | 360 | 15 | 0 | 181 | 0 | 0 | 0 | 0 | 0 | 1460 |
| | NL | NT | NR | NU | NT2 | SL | ST | SR | SU | SU2 | EL | ET | ER | EU | EL2 | WL | WT | WR | WU | WR2 | S2U | S2L2 | S2T2 | S2R2 | S2U2 | TOTAL |
| **TOTAL VOLUMES :** | 1669 | 133 | 866 | 0 | 25 | 0 | 0 | 359 | 0 | 108 | 350 | 3131 | 570 | 0 | 0 | 0 | 2841 | 83 | 0 | 1282 | 0 | 0 | 0 | 0 | 0 | 11417 |
| **APPROACH %'s :** | 61.98% | 4.94% | 32.16% | 0.00% | 0.93% | 0.00% | 0.00% | 76.87% | 0.00% | 23.13% | 8.64% | 77.29% | 14.07% | 0.00% | 0.00% | 0.00% | 67.55% | 1.97% | 0.00% | 30.48% | | | | | | |
| **PEAK HR :** | 05:00 PM - 06:00 PM | | | | | | | | | | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 813 | 59 | 389 | 0 | 18 | 0 | 0 | 188 | 0 | 56 | 182 | 1637 | 338 | 0 | 0 | 0 | 1405 | 43 | 0 | 738 | 0 | 0 | 0 | 0 | 0 | 5866 |
| **PEAK HR FACTOR :** | 0.977 | 0.670 | 0.778 | 0.000 | 0.750 | 0.000 | 0.000 | 0.797 | 0.000 | 0.778 | 0.875 | 0.963 | 0.854 | 0.000 | 0.000 | 0.000 | 0.960 | 0.717 | 0.000 | 0.918 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.993 |
| | | | 0.949 | | | | | 0.884 | | | | | 0.951 | | | | | 0.983 | | | | | | | | |

Prepared by National Data & Surveying Services

# SR-57 NB Ramps & Imperial Hwy

## Peak Hour Turning Movement Count

**ID:** 19-01101-016
**City:** Brea

**Day:** Wednesday
**Date:** 05/22/2019

| PEAK HOURS | COUNT PERIODS |
|---|---|
| 07:15 AM - 08:15 AM | 07:00 AM - 09:00 AM |
| NONE | NONE |
| 05:00 PM - 06:00 PM | 04:00 PM - 06:00 PM |

### SR-57 NB Ramps — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 52 | 0 | 0 | 0 | 325 | AM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| PM | 188 | 0 | 0 | 0 | 284 | PM |

### EASTBOUND (Imperial Hwy)

| AM | NOON | PM | |
|---|---|---|---|
| 1711 | 0 | 2406 | ⇦ |
| 0 | 0 | 0 | 0 ↩ |
| 152 | 0 | 182 | 1 ↱ |
| 1217 | 0 | 1637 | 3 → |
| 505 | 0 | 338 | 1 ↳ |

### WESTBOUND (Imperial Hwy)

| PM | NOON | AM | |
|---|---|---|---|
| 43 | 0 | 6 | 0 ↪ |
| 1405 | 0 | 873 | 4 ← |
| 0 | 0 | 0 | 0 ↰ |
| 0 | 0 | 0 | 0 ↩ |
| 2026 | 0 | 1963 | ⇨ |

### CONTROL

Signalized

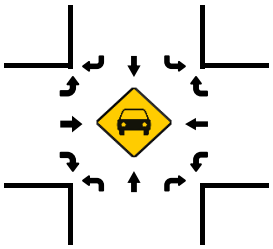
| | | | |
|---|---|---|---|
| TEV | 4504 AM | 0 NOON | 5054 PM |
| PHF | 0.93 | | 0.99 |

### NORTHBOUND

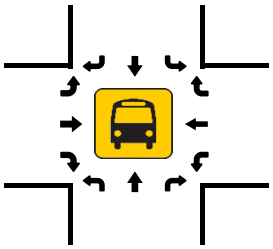
| | | | | | | |
|---|---|---|---|---|---|---|
| | 2 | 0 | 0 | 0 | | |
| | 0 | 2.3 | 0.3 | 1.3 | | |
| PM | 338 | 0 | 813 | 59 | 389 | PM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| AM | 505 | 0 | 786 | 167 | 746 | AM |

### SR-57 NB Ramps

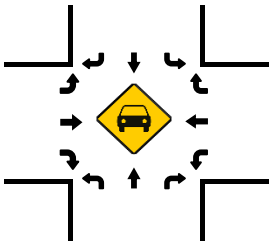
Total Vehicles (AM)



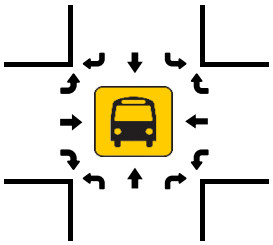
Total Vehicles (AM)



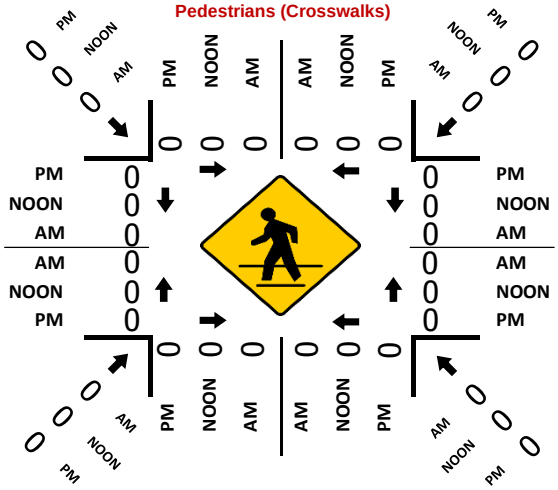
Total Vehicles (NOON)



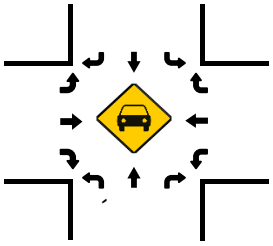
Total Vehicles (NOON)



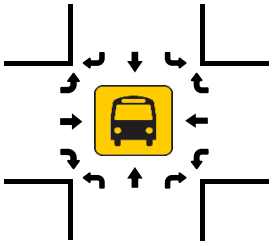
Pedestrians (Crosswalks)




Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** SR-57 NB Ramps & Imperial Hwy
**City:** Brea
**Control:** Signalized

**Project ID:** 19-01101-016
**Date:** 5/18/2019

**Total**

| NS/EW Streets: | SR-57 NB Ramps | | | | | SR-57 NB Ramps | | | | | Imperial Hwy | | | | | Imperial Hwy | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NORTHBOUND | | | | | SOUTHBOUND | | | | | EASTBOUND | | | | | WESTBOUND | | | | | | | | SOUTHBOUND2 | | |
| **NOON** | 2.3 | 0.3 | 1.3 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 3 | 1 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | NL | NT | NR | NU | NT2 | SL | ST | SR | SU | SU2 | EL | ET | ER | EU | EL2 | WL | WT | WR | WU | WR2 | S2U | S2L2 | S2T2 | S2R2 | S2U2 | TOTAL |
| 11:00 AM | 258 | 30 | 110 | 0 | 0 | 0 | 0 | 31 | 0 | 10 | 60 | 320 | 115 | 0 | 0 | 0 | 314 | 8 | 0 | 125 | 0 | 0 | 0 | 0 | 0 | 1381 |
| 11:15 AM | 287 | 29 | 118 | 0 | 1 | 0 | 0 | 38 | 0 | 13 | 53 | 321 | 140 | 0 | 0 | 0 | 290 | 6 | 0 | 108 | 0 | 0 | 0 | 0 | 0 | 1404 |
| 11:30 AM | 313 | 33 | 114 | 0 | 1 | 0 | 0 | 31 | 0 | 11 | 60 | 327 | 136 | 0 | 0 | 0 | 312 | 7 | 0 | 120 | 0 | 0 | 0 | 0 | 0 | 1465 |
| 11:45 AM | 314 | 29 | 130 | 0 | 1 | 0 | 0 | 52 | 0 | 7 | 59 | 350 | 157 | 0 | 0 | 0 | 340 | 9 | 0 | 121 | 0 | 0 | 0 | 0 | 0 | 1569 |
| 12:00 PM | 285 | 47 | 125 | 0 | 7 | 0 | 0 | 40 | 1 | 15 | 53 | 350 | 134 | 0 | 0 | 0 | 293 | 7 | 0 | 111 | 0 | 0 | 0 | 0 | 0 | 1468 |
| 12:15 PM | 261 | 31 | 121 | 0 | 3 | 0 | 0 | 49 | 0 | 9 | 44 | 377 | 147 | 0 | 0 | 0 | 294 | 6 | 0 | 106 | 0 | 0 | 0 | 0 | 0 | 1448 |
| 12:30 PM | 301 | 45 | 133 | 0 | 1 | 0 | 0 | 34 | 0 | 14 | 52 | 461 | 127 | 0 | 0 | 0 | 330 | 4 | 0 | 111 | 0 | 0 | 0 | 0 | 0 | 1613 |
| 12:45 PM | 322 | 34 | 142 | 0 | 0 | 0 | 0 | 40 | 0 | 8 | 51 | 425 | 148 | 0 | 0 | 0 | 273 | 11 | 0 | 118 | 0 | 0 | 0 | 0 | 0 | 1572 |
| 1:00 PM | 271 | 35 | 119 | 0 | 3 | 0 | 0 | 58 | 0 | 12 | 69 | 376 | 126 | 0 | 0 | 0 | 310 | 8 | 0 | 102 | 0 | 0 | 0 | 0 | 0 | 1489 |
| 1:15 PM | 283 | 35 | 132 | 0 | 1 | 0 | 0 | 43 | 0 | 16 | 75 | 361 | 120 | 0 | 0 | 0 | 300 | 7 | 0 | 119 | 0 | 0 | 0 | 0 | 0 | 1492 |
| 1:30 PM | 245 | 33 | 111 | 0 | 3 | 0 | 0 | 54 | 0 | 27 | 63 | 388 | 138 | 0 | 0 | 0 | 373 | 10 | 0 | 121 | 0 | 0 | 0 | 0 | 0 | 1566 |
| 1:45 PM | 260 | 28 | 121 | 0 | 0 | 0 | 0 | 57 | 0 | 26 | 54 | 372 | 153 | 0 | 0 | 0 | 333 | 6 | 0 | 134 | 0 | 0 | 0 | 0 | 0 | 1544 |
| 2:00 PM | 268 | 27 | 126 | 0 | 0 | 0 | 0 | 49 | 0 | 18 | 51 | 377 | 144 | 0 | 0 | 0 | 333 | 11 | 0 | 102 | 0 | 0 | 0 | 0 | 0 | 1506 |
| 2:15 PM | 260 | 31 | 116 | 0 | 1 | 0 | 0 | 64 | 0 | 18 | 50 | 308 | 128 | 0 | 0 | 0 | 335 | 7 | 0 | 120 | 0 | 0 | 0 | 0 | 0 | 1438 |
| 2:30 PM | 255 | 30 | 124 | 0 | 1 | 0 | 0 | 48 | 0 | 17 | 56 | 321 | 147 | 0 | 0 | 0 | 340 | 5 | 0 | 108 | 0 | 0 | 0 | 0 | 0 | 1452 |
| 2:45 PM | 255 | 51 | 109 | 0 | 0 | 0 | 0 | 51 | 0 | 22 | 53 | 342 | 127 | 0 | 0 | 0 | 305 | 8 | 0 | 121 | 0 | 0 | 0 | 0 | 0 | 1444 |
| | NL | NT | NR | NU | NT2 | SL | ST | SR | SU | SU2 | EL | ET | ER | EU | EL2 | WL | WT | WR | WU | WR2 | S2U | S2L2 | S2T2 | S2R2 | S2U2 | TOTAL |
| **TOTAL VOLUMES :** | 4438 | 548 | 1951 | 0 | 23 | 0 | 0 | 739 | 1 | 243 | 903 | 5776 | 2187 | 0 | 0 | 0 | 5075 | 120 | 0 | 1847 | 0 | 0 | 0 | 0 | 0 | 23851 |
| **APPROACH %'s :** | 63.76% | 7.87% | 28.03% | 0.00% | 0.33% | 0.00% | 0.00% | 75.18% | 0.10% | 24.72% | 10.18% | 65.15% | 24.67% | 0.00% | 0.00% | 0.00% | 72.07% | 1.70% | 0.00% | 26.23% | | | | | | |
| **PEAK HR :** | 12:30 PM - 01:30 PM | | | | | | | | | | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 1177 | 149 | 526 | 0 | 5 | 0 | 0 | 175 | 0 | 50 | 247 | 1623 | 521 | 0 | 0 | 0 | 1213 | 30 | 0 | 450 | 0 | 0 | 0 | 0 | 0 | 6166 |
| **PEAK HR FACTOR :** | 0.914 | 0.828 | 0.926 | 0.000 | 0.417 | 0.000 | 0.000 | 0.754 | 0.000 | 0.781 | 0.823 | 0.880 | 0.880 | 0.000 | 0.000 | 0.000 | 0.919 | 0.682 | 0.000 | 0.945 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.956 |
| | | | 0.932 | | | | | 0.804 | | | | | 0.934 | | | | | 0.951 | | | | | | | |

Prepared by National Data & Surveying Services

# SR-57 NB Ramps & Imperial Hwy

## Peak Hour Turning Movement Count

**ID:** 19-01101-016
**City:** Brea

**Day:** Saturday
**Date:** 05/18/2019

| PEAK HOURS | COUNT PERIODS |
|---|---|
| NONE | NONE |
| 12:30 PM - 01:30 PM | 11:00 AM - 03:00 PM |
| NONE | NONE |

### SR-57 NB Ramps — SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 0 | 0 | 0 | 0 | 0 | AM |
| NOON | 175 | 0 | 0 | 0 | 426 | NOON |
| PM | 0 | 0 | 0 | 0 | 0 | PM |

### EASTBOUND (Imperial Hwy)

| AM | NOON | PM | |
|---|---|---|---|
| 0 | 2565 | 0 | ⇦ |
| 0 | 0 | 0 | ↰ 0 |
| 0 | 247 | 0 | ↑ 1 |
| 0 | 1623 | 0 | → 3 |
| 0 | 521 | 0 | ↱ 1 |

### WESTBOUND (Imperial Hwy)

| PM | NOON | AM | |
|---|---|---|---|
| 0 | 30 | 0 | ↰ 0 |
| 0 | 1213 | 0 | ← 4 |
| 0 | 0 | 0 | ↶ 0 |
| 0 | 0 | 0 | ↩ 0 |
| 0 | 2149 | 0 | ⇨ |

### CONTROL

Signalized

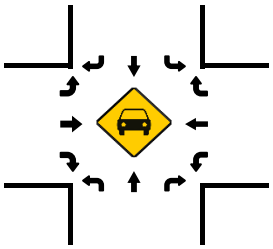
| | AM | NOON | PM |
|---|---|---|---|
| TEV | 0 | 5661 | 0 |
| PHF | | 0.96 | |

### NORTHBOUND — SR-57 NB Ramps

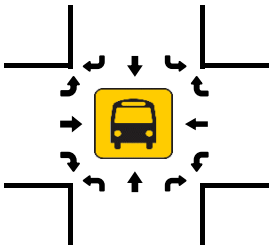
| | | | | | | |
|---|---|---|---|---|---|---|
| PM | 0 | 0 | 0 | 0 | 0 | PM |
| NOON | 521 | 0 | 1177 | 149 | 526 | NOON |
| AM | 0 | 0 | 0 | 0 | 0 | AM |

| | | | |
|---|---|---|---|
| 2 | 0 | 0 | 0 |
| 0 | 2.3 | 0.3 | 1.3 |

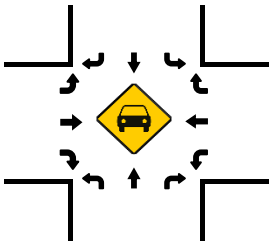
Total Vehicles (AM)



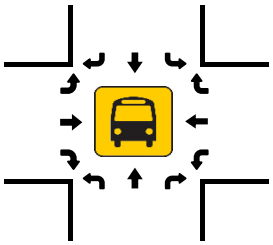
Total Vehicles (AM)



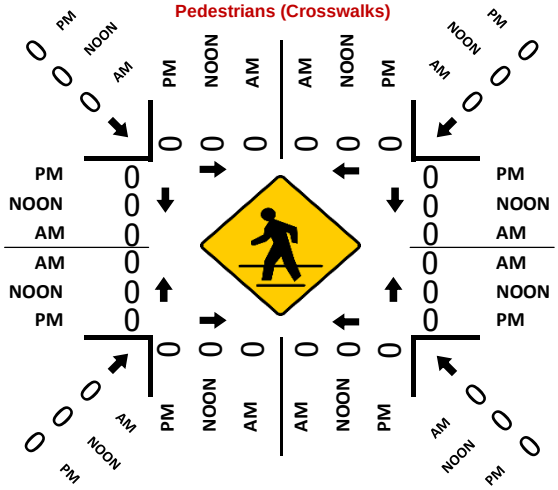
Total Vehicles (NOON)



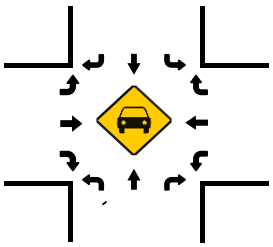
Total Vehicles (NOON)



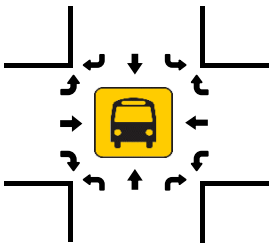
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** Associated Rd & Imperial Hwy
**City:** Brea
**Control:** Signalized

**Project ID:** 18-01231-009
**Date:** 11/13/2018

**Total**

| NS/EW Streets: | Associated Rd | | | | Associated Rd | | | | Imperial Hwy | | | | Imperial Hwy | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 2 | 2 | 0 | 0 | 2 | 1 | 1 | 0 | 1 | 3 | 0 | 0 | 1 | 4 | 0 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 7:00 AM | 34 | 29 | 10 | 0 | 27 | 78 | 24 | 0 | 35 | 385 | 21 | 0 | 15 | 278 | 10 | 0 | 946 |
| 7:15 AM | 50 | 32 | 12 | 0 | 32 | 65 | 26 | 0 | 37 | 376 | 32 | 1 | 23 | 297 | 10 | 0 | 993 |
| 7:30 AM | 33 | 44 | 13 | 0 | 24 | 86 | 37 | 0 | 32 | 386 | 27 | 1 | 20 | 347 | 17 | 0 | 1067 |
| 7:45 AM | 28 | 62 | 21 | 0 | 29 | 66 | 31 | 0 | 38 | 464 | 29 | 0 | 12 | 388 | 22 | 0 | 1190 |
| 8:00 AM | 43 | 47 | 15 | 0 | 47 | 68 | 34 | 1 | 38 | 422 | 17 | 0 | 23 | 378 | 21 | 0 | 1154 |
| 8:15 AM | 32 | 39 | 17 | 0 | 36 | 85 | 33 | 1 | 29 | 435 | 19 | 0 | 30 | 348 | 18 | 0 | 1122 |
| 8:30 AM | 38 | 20 | 14 | 0 | 50 | 68 | 30 | 0 | 28 | 464 | 26 | 0 | 21 | 286 | 14 | 0 | 1059 |
| 8:45 AM | 40 | 33 | 33 | 0 | 43 | 51 | 17 | 0 | 25 | 418 | 18 | 1 | 21 | 284 | 17 | 0 | 1001 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 298 | 306 | 135 | 0 | 288 | 567 | 232 | 2 | 262 | 3350 | 189 | 3 | 165 | 2606 | 129 | 0 | 8532 |
| **APPROACH %'s :** | 40.32% | 41.41% | 18.27% | 0.00% | 26.45% | 52.07% | 21.30% | 0.18% | 6.89% | 88.07% | 4.97% | 0.08% | 5.69% | 89.86% | 4.45% | 0.00% | |
| **PEAK HR :** | 07:30 AM - 08:30 AM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 136 | 192 | 66 | 0 | 136 | 305 | 135 | 2 | 137 | 1707 | 92 | 1 | 85 | 1461 | 78 | 0 | 4533 |
| **PEAK HR FACTOR :** | 0.791 | 0.774 | 0.786 | 0.000 | 0.723 | 0.887 | 0.912 | 0.500 | 0.901 | 0.920 | 0.793 | 0.250 | 0.708 | 0.941 | 0.886 | 0.000 | 0.952 |
| | 0.887 | | | | 0.932 | | | | 0.912 | | | | 0.962 | | | | |

| PM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 2 | 0 | 0 | 2 | 1 | 1 | 0 | 1 | 3 | 0 | 0 | 1 | 4 | 0 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 4:00 PM | 36 | 48 | 23 | 0 | 60 | 60 | 44 | 1 | 47 | 389 | 32 | 1 | 33 | 392 | 29 | 0 | 1195 |
| 4:15 PM | 50 | 57 | 24 | 0 | 49 | 76 | 58 | 1 | 49 | 415 | 35 | 0 | 32 | 378 | 39 | 0 | 1263 |
| 4:30 PM | 48 | 56 | 16 | 0 | 55 | 67 | 37 | 0 | 45 | 406 | 22 | 0 | 29 | 412 | 46 | 1 | 1240 |
| 4:45 PM | 52 | 41 | 17 | 0 | 75 | 97 | 69 | 0 | 55 | 410 | 31 | 0 | 37 | 362 | 55 | 0 | 1301 |
| 5:00 PM | 52 | 56 | 21 | 1 | 73 | 87 | 52 | 0 | 56 | 383 | 29 | 1 | 38 | 346 | 36 | 0 | 1231 |
| 5:15 PM | 55 | 67 | 20 | 0 | 60 | 63 | 48 | 0 | 65 | 431 | 34 | 0 | 45 | 422 | 33 | 0 | 1343 |
| 5:30 PM | 39 | 76 | 20 | 0 | 62 | 76 | 37 | 0 | 56 | 424 | 34 | 0 | 42 | 420 | 34 | 0 | 1320 |
| 5:45 PM | 50 | 48 | 21 | 1 | 63 | 62 | 42 | 0 | 62 | 433 | 41 | 1 | 32 | 383 | 41 | 0 | 1280 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 382 | 449 | 162 | 2 | 497 | 588 | 387 | 2 | 435 | 3291 | 258 | 3 | 288 | 3115 | 313 | 1 | 10173 |
| **APPROACH %'s :** | 38.39% | 45.13% | 16.28% | 0.20% | 33.72% | 39.89% | 26.26% | 0.14% | 10.91% | 82.54% | 6.47% | 0.08% | 7.75% | 83.80% | 8.42% | 0.03% | |
| **PEAK HR :** | 04:45 PM - 05:45 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 198 | 240 | 78 | 1 | 270 | 323 | 206 | 0 | 232 | 1648 | 128 | 1 | 162 | 1550 | 158 | 0 | 5195 |
| **PEAK HR FACTOR :** | 0.900 | 0.789 | 0.929 | 0.250 | 0.900 | 0.832 | 0.746 | 0.000 | 0.892 | 0.956 | 0.941 | 0.250 | 0.900 | 0.918 | 0.718 | 0.000 | 0.967 |
| | 0.910 | | | | 0.829 | | | | 0.948 | | | | 0.935 | | | | |

Prepared by National Data & Surveying Services

# Associated Rd & Imperial Hwy

## Peak Hour Turning Movement Count

**ID:** 18-01231-009
**City:** Brea

**Day:** Tuesday
**Date:** 11/13/2018

**PEAK HOURS**

| | |
|---|---|
| AM | 07:30 AM - 08:30 AM |
| NOON | NONE |
| PM | 04:45 PM - 05:45 PM |

**COUNT PERIODS**

| | |
|---|---|
| AM | 07:00 AM - 09:00 AM |
| NOON | NONE |
| PM | 04:00 PM - 06:00 PM |

### SOUTHBOUND — Associated Rd

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 135 | 305 | 136 | 2 | 409 | AM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| PM | 206 | 323 | 270 | 0 | 630 | PM |

1 1 2 0

### EASTBOUND — Imperial Hwy

| AM | NOON | PM | |
|---|---|---|---|
| 1733 | 0 | 1955 | |
| 1 | 0 | 1 | 0 |
| 137 | 0 | 232 | 1 |
| 1707 | 0 | 1648 | 3 |
| 92 | 0 | 128 | 0 |

### WESTBOUND — Imperial Hwy

| PM | NOON | AM | |
|---|---|---|---|
| 158 | 0 | 78 | 0 |
| 1550 | 0 | 1461 | 4 |
| 162 | 0 | 85 | 1 |
| 0 | 0 | 0 | 0 |
| 1996 | 0 | 1909 | |

### CONTROL

Signalized

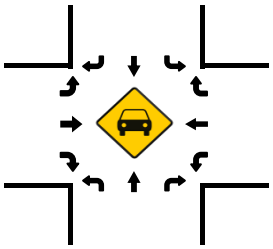
| | | | |
|---|---|---|---|
| TEV | 4533 AM | 0 NOON | 5195 PM |
| PHF | 0.95 | | 0.97 |

0 2 2 0

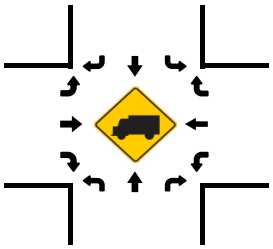
### NORTHBOUND — Associated Rd

| | | | | | |
|---|---|---|---|---|---|
| PM | 614 | 1 | 198 | 240 | 78 | PM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| AM | 482 | 0 | 136 | 192 | 66 | AM |

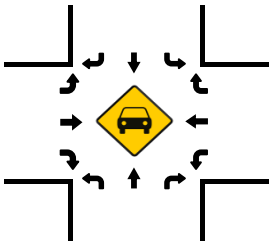
Total Vehicles (AM)



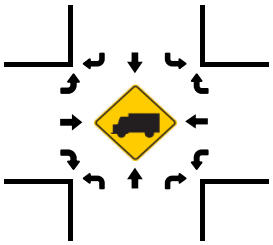
2axle (AM)



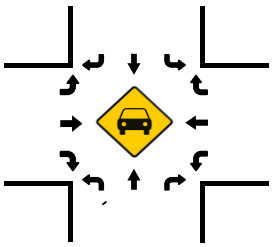
Total Vehicles (Noon)



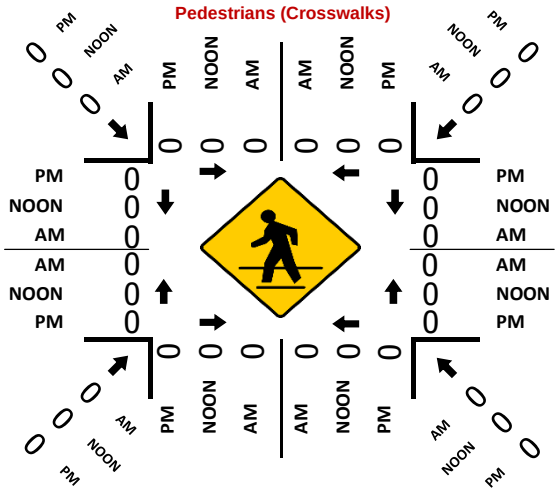
2axle (NOON)



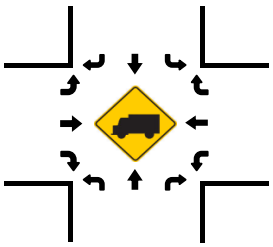
Total Vehicles (PM)



Pedestrians (Crosswalks)



2axle (PM)



# INTERSECTION TURNING MOVEMENT COUNTS

T418

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Sat, May 18, 19

LOCATION: Brea
NORTH & SOUTH: Associated
EAST & WEST: Imperial

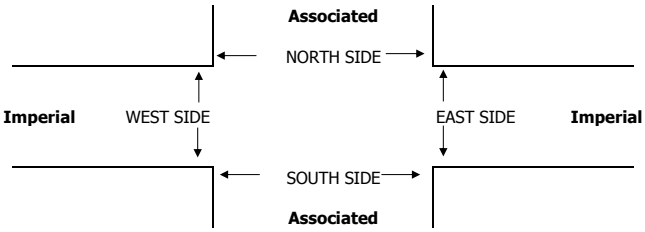
PROJECT #: SC2213
LOCATION #: 4
CONTROL: SIGNAL

NOTES: Queue WB

AM / PM / MD / OTHER / OTHER

☑ Add U-Turns to Left Turns

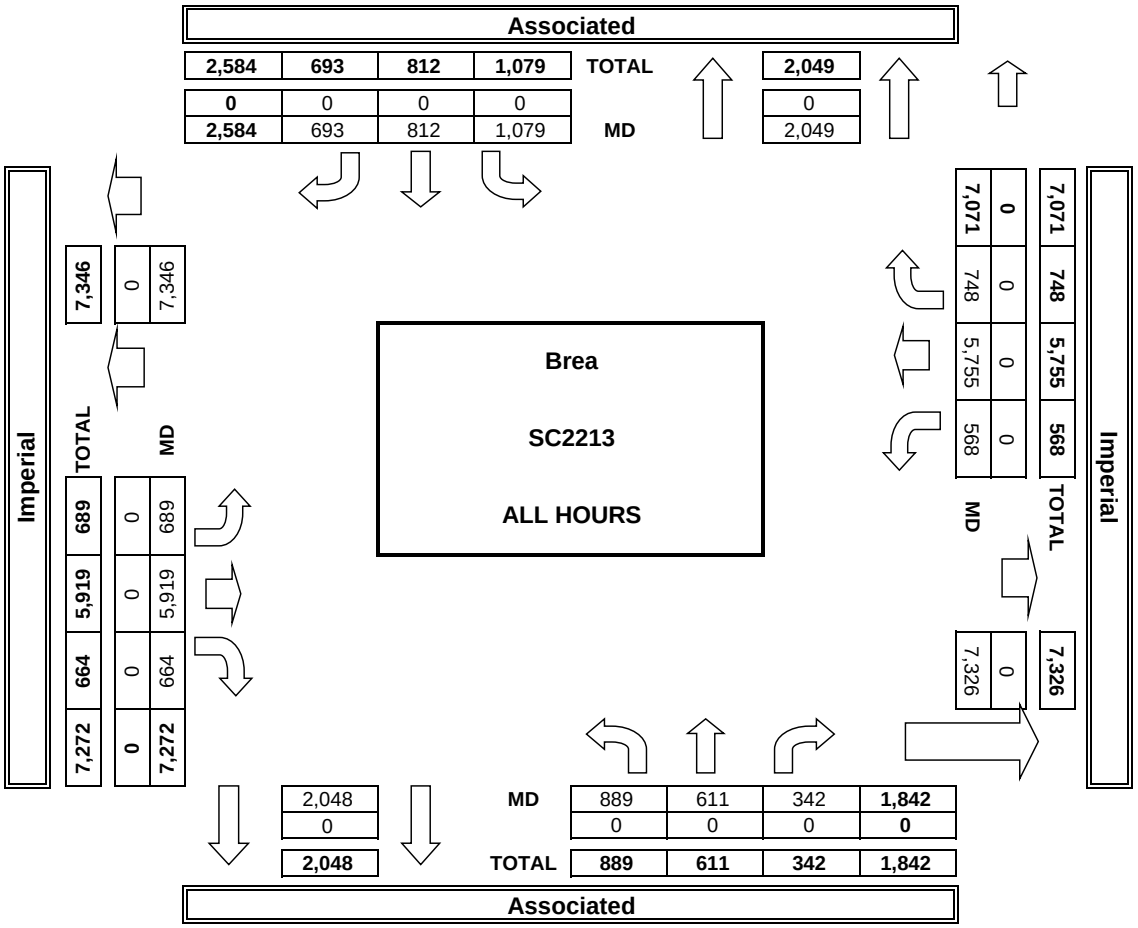
| | | NORTHBOUND Associated | | | SOUTHBOUND Associated | | | EASTBOUND Imperial | | | WESTBOUND Imperial | | | | U-TURNS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LANES: | NL 2 | NT 2 | NR 0 | SL 2 | ST 1 | SR 1 | EL 1 | ET 3 | ER 0 | WL 1 | WT 4 | WR 0 | TOTAL | NB 0 | SB 0 | EB 0 | WB 0 | TTL |
| MD | 11:00 AM | 50 | 32 | 20 | 51 | 32 | 39 | 35 | 337 | 26 | 32 | 378 | 33 | 1,065 | 1 | 1 | 1 | 0 | 3 |
| | 11:15 AM | 40 | 21 | 17 | 48 | 43 | 31 | 30 | 361 | 33 | 36 | 379 | 61 | 1,100 | 0 | 1 | 1 | 0 | 2 |
| | 11:30 AM | 78 | 33 | 20 | 54 | 37 | 49 | 38 | 348 | 36 | 23 | 366 | 37 | 1,119 | 0 | 0 | 3 | 0 | 3 |
| | 11:45 AM | 69 | 44 | 22 | 65 | 50 | 39 | 57 | 368 | 37 | 35 | 381 | 54 | 1,221 | 1 | 0 | 1 | 0 | 2 |
| | 12:00 PM | 70 | 50 | 19 | 70 | 55 | 47 | 52 | 367 | 26 | 33 | 321 | 49 | 1,159 | 1 | 1 | 1 | 0 | 3 |
| | 12:15 PM | 78 | 42 | 25 | 81 | 53 | 43 | 59 | 360 | 55 | 28 | 302 | 44 | 1,170 | 0 | 0 | 0 | 0 | 0 |
| | 12:30 PM | 60 | 48 | 29 | 69 | 63 | 30 | 57 | 417 | 75 | 33 | 342 | 55 | 1,278 | 0 | 1 | 2 | 0 | 3 |
| | 12:45 PM | 57 | 41 | 20 | 89 | 59 | 47 | 48 | 404 | 68 | 27 | 334 | 49 | 1,243 | 0 | 1 | 0 | 0 | 1 |
| | 1:00 PM | 51 | 40 | 30 | 73 | 47 | 43 | 47 | 361 | 43 | 35 | 324 | 48 | 1,142 | 0 | 1 | 0 | 0 | 1 |
| | 1:15 PM | 57 | 43 | 25 | 78 | 53 | 49 | 47 | 373 | 40 | 42 | 361 | 43 | 1,211 | 0 | 1 | 1 | 0 | 2 |
| | 1:30 PM | 36 | 43 | 17 | 72 | 58 | 64 | 31 | 382 | 32 | 50 | 393 | 41 | 1,219 | 0 | 0 | 0 | 0 | 0 |
| | 1:45 PM | 56 | 38 | 11 | 78 | 49 | 46 | 49 | 393 | 52 | 35 | 379 | 42 | 1,228 | 1 | 1 | 0 | 0 | 2 |
| | 2:00 PM | 47 | 35 | 18 | 65 | 65 | 45 | 41 | 375 | 40 | 33 | 349 | 40 | 1,153 | 0 | 1 | 1 | 0 | 2 |
| | 2:15 PM | 45 | 33 | 21 | 61 | 48 | 42 | 35 | 348 | 35 | 42 | 420 | 66 | 1,196 | 0 | 1 | 2 | 0 | 3 |
| | 2:30 PM | 45 | 33 | 32 | 65 | 51 | 44 | 34 | 358 | 32 | 47 | 375 | 35 | 1,151 | 0 | 0 | 0 | 0 | 0 |
| | 2:45 PM | 50 | 35 | 16 | 60 | 49 | 35 | 29 | 367 | 34 | 37 | 351 | 51 | 1,114 | 0 | 4 | 0 | 0 | 4 |
| | VOLUMES | 889 | 611 | 342 | 1,079 | 812 | 693 | 689 | 5,919 | 664 | 568 | 5,755 | 748 | 18,769 | 4 | 14 | 13 | 0 | 31 |
| | APPROACH % | 48% | 33% | 19% | 42% | 31% | 27% | 9% | 81% | 9% | 8% | 81% | 11% | | | | | | |
| | APP/DEPART | 1,842 | / | 2,049 | 2,584 | / | 2,048 | 7,272 | / | 7,326 | 7,071 | / | 7,346 | 0 | | | | | |
| | BEGIN PEAK HR | | 12:30 PM | | | | | | | | | | | | | | | | |
| | VOLUMES | 225 | 172 | 104 | 309 | 222 | 169 | 199 | 1,555 | 226 | 137 | 1,361 | 195 | 4,874 | | | | | |
| | APPROACH % | 45% | 34% | 21% | 44% | 32% | 24% | 10% | 79% | 11% | 8% | 80% | 12% | | | | | | |
| | PEAK HR FACTOR | | 0.914 | | | 0.897 | | | 0.902 | | | 0.949 | | 0.953 | | | | | |
| | APP/DEPART | 501 | / | 567 | 700 | / | 585 | 1,980 | / | 1,964 | 1,693 | / | 1,758 | 0 | | | | | |

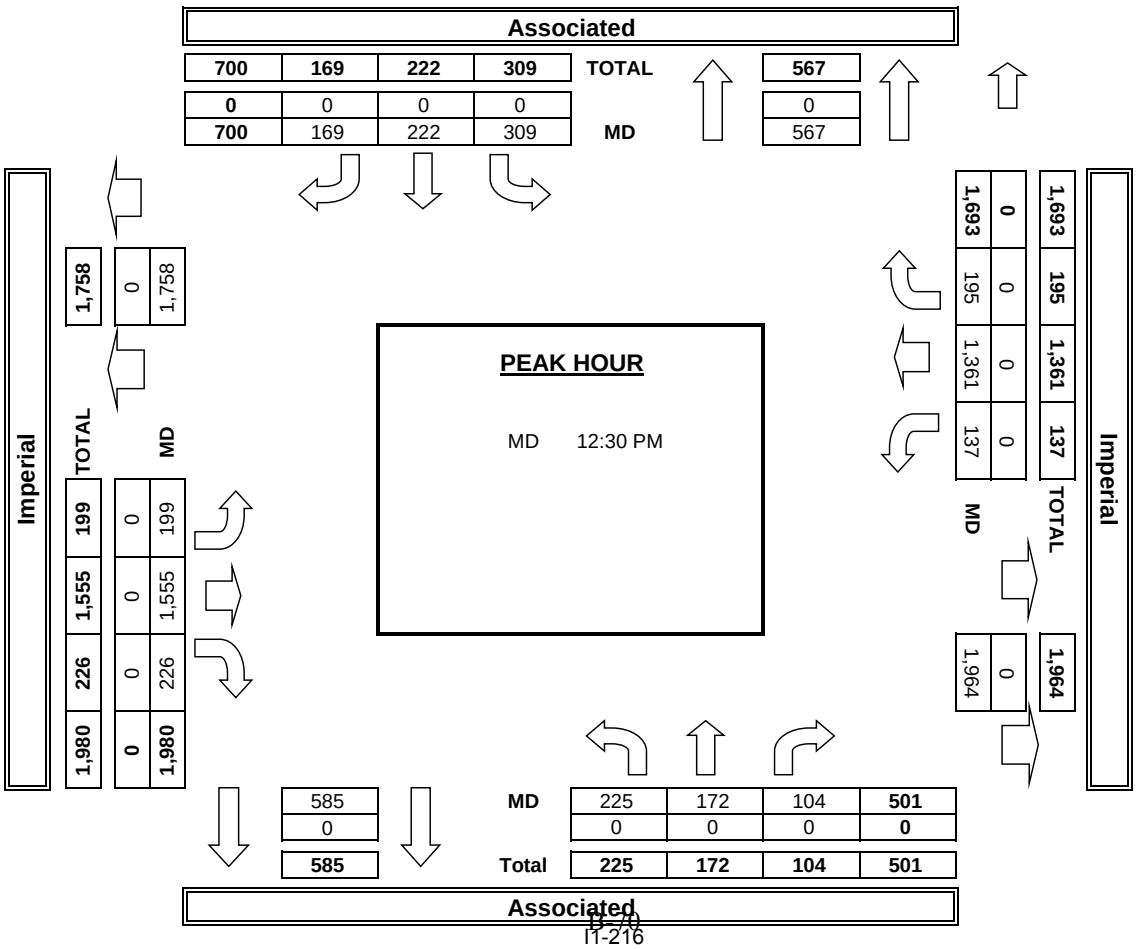



| | | PEDESTRIAN + BIKE CROSSINGS | | | | | PEDESTRIAN CROSSINGS | | | | | BICYCLE CROSSINGS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | NS | SS | ES | WS | TOTAL |
| MD | 11:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 11:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 11:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 11:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | AM BEGIN PEAK HR | 12:30 PM | | | | | 0 | 0 | 0 | 0 | 0 | | | | | |

**AimTD LLC**

TURNING MOVEMENT COUNTS



National Data & Surveying Services

# Intersection Turning Movement Count

**Location:** Castlegate Ln/Placentia Ave & Imperial Hwy
**City:** Brea
**Control:** Signalized

**Project ID:** 18-01231-010
**Date:** 11/13/2018

**Total**

| NS/EW Streets: | Castlegate Ln/Placentia Ave | | | | Castlegate Ln/Placentia Ave | | | | Imperial Hwy | | | | Imperial Hwy | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM** | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
| | 1.5 | 0.5 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 3 | 1 | 0 | 1 | 3 | 0 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 7:00 AM | 27 | 1 | 19 | 0 | 6 | 1 | 0 | 0 | 0 | 363 | 55 | 0 | 21 | 289 | 5 | 0 | 787 |
| 7:15 AM | 30 | 5 | 27 | 0 | 8 | 6 | 4 | 0 | 0 | 356 | 50 | 0 | 30 | 292 | 5 | 0 | 813 |
| 7:30 AM | 49 | 5 | 40 | 0 | 4 | 2 | 5 | 0 | 1 | 362 | 85 | 0 | 34 | 312 | 1 | 0 | 900 |
| 7:45 AM | 54 | 5 | 32 | 0 | 6 | 12 | 5 | 0 | 4 | 429 | 78 | 1 | 42 | 377 | 9 | 0 | 1054 |
| 8:00 AM | 25 | 3 | 24 | 0 | 5 | 6 | 2 | 0 | 2 | 415 | 83 | 0 | 46 | 346 | 7 | 0 | 964 |
| 8:15 AM | 42 | 1 | 30 | 0 | 4 | 5 | 3 | 0 | 2 | 392 | 77 | 0 | 26 | 338 | 9 | 0 | 929 |
| 8:30 AM | 37 | 2 | 48 | 0 | 8 | 3 | 3 | 0 | 3 | 435 | 91 | 0 | 48 | 276 | 5 | 0 | 959 |
| 8:45 AM | 34 | 1 | 32 | 0 | 8 | 5 | 3 | 0 | 2 | 424 | 72 | 0 | 32 | 292 | 7 | 1 | 913 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 298 | 23 | 252 | 0 | 49 | 40 | 25 | 0 | 14 | 3176 | 591 | 1 | 279 | 2522 | 48 | 1 | 7319 |
| **APPROACH %'s :** | 52.01% | 4.01% | 43.98% | 0.00% | 42.98% | 35.09% | 21.93% | 0.00% | 0.37% | 83.98% | 15.63% | 0.03% | 9.79% | 88.49% | 1.68% | 0.04% | |
| **PEAK HR :** | 07:45 AM - 08:45 AM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 158 | 11 | 134 | 0 | 23 | 26 | 13 | 0 | 11 | 1671 | 329 | 1 | 162 | 1337 | 30 | 0 | 3906 |
| **PEAK HR FACTOR :** | 0.731 | 0.550 | 0.698 | 0.000 | 0.719 | 0.542 | 0.650 | 0.000 | 0.688 | 0.960 | 0.904 | 0.250 | 0.844 | 0.887 | 0.833 | 0.000 | 0.926 |
| | 0.832 | | | | 0.674 | | | | 0.951 | | | | 0.893 | | | | |

| PM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.5 | 0.5 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 3 | 1 | 0 | 1 | 3 | 0 | 0 | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| 4:00 PM | 41 | 6 | 35 | 0 | 8 | 6 | 2 | 0 | 3 | 409 | 61 | 1 | 40 | 425 | 12 | 2 | 1051 |
| 4:15 PM | 50 | 8 | 54 | 0 | 6 | 3 | 5 | 0 | 3 | 421 | 47 | 0 | 40 | 433 | 7 | 1 | 1078 |
| 4:30 PM | 66 | 9 | 56 | 0 | 2 | 3 | 2 | 0 | 5 | 411 | 54 | 0 | 48 | 447 | 7 | 0 | 1110 |
| 4:45 PM | 47 | 4 | 55 | 0 | 8 | 12 | 2 | 0 | 7 | 425 | 59 | 0 | 48 | 405 | 9 | 0 | 1081 |
| 5:00 PM | 49 | 11 | 63 | 0 | 7 | 3 | 5 | 0 | 3 | 398 | 65 | 0 | 56 | 417 | 14 | 4 | 1095 |
| 5:15 PM | 56 | 20 | 72 | 0 | 6 | 3 | 4 | 0 | 2 | 429 | 77 | 0 | 53 | 444 | 22 | 4 | 1192 |
| 5:30 PM | 41 | 7 | 54 | 0 | 5 | 2 | 2 | 0 | 4 | 421 | 77 | 0 | 38 | 414 | 15 | 1 | 1081 |
| 5:45 PM | 44 | 10 | 41 | 0 | 7 | 4 | 2 | 0 | 0 | 445 | 56 | 2 | 48 | 404 | 13 | 1 | 1077 |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| **TOTAL VOLUMES :** | 394 | 75 | 430 | 0 | 49 | 36 | 24 | 0 | 27 | 3359 | 496 | 3 | 371 | 3389 | 99 | 13 | 8765 |
| **APPROACH %'s :** | 43.83% | 8.34% | 47.83% | 0.00% | 44.95% | 33.03% | 22.02% | 0.00% | 0.69% | 86.46% | 12.77% | 0.08% | 9.58% | 87.53% | 2.56% | 0.34% | |
| **PEAK HR :** | 04:30 PM - 05:30 PM | | | | | | | | | | | | | | | | TOTAL |
| **PEAK HR VOL :** | 218 | 44 | 246 | 0 | 23 | 21 | 13 | 0 | 17 | 1663 | 255 | 0 | 205 | 1713 | 52 | 8 | 4478 |
| **PEAK HR FACTOR :** | 0.826 | 0.550 | 0.854 | 0.000 | 0.719 | 0.438 | 0.650 | 0.000 | 0.607 | 0.969 | 0.828 | 0.000 | 0.915 | 0.958 | 0.591 | 0.500 | 0.939 |
| | 0.858 | | | | 0.648 | | | | 0.952 | | | | 0.946 | | | | |

Prepared by National Data & Surveying Services

# Castlegate Ln/Placentia Ave & Imperial Hwy

## Peak Hour Turning Movement Count

**ID:** 18-01231-010
**City:** Brea

**Day:** Tuesday
**Date:** 11/13/2018

**PEAK HOURS**

AM: 07:45 AM - 08:45 AM
NOON: NONE
PM: 04:30 PM - 05:30 PM

**COUNT PERIODS**

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

### Castlegate Ln/Placentia Ave

### SOUTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| AM | 13 | 26 | 23 | 0 | 52 | AM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| PM | 13 | 21 | 23 | 0 | 113 | PM |

### EASTBOUND (Imperial Hwy)

| AM | NOON | PM | | |
|---|---|---|---|---|
| 1509 | 0 | 1944 | | |
| 1 | 0 | 0 | 0 | |
| 11 | 0 | 17 | 1 | |
| 1671 | 0 | 1663 | 3 | |
| 329 | 0 | 255 | 1 | |

### WESTBOUND (Imperial Hwy)

| PM | NOON | AM | |
|---|---|---|---|
| 52 | 0 | 30 | 0 |
| 1713 | 0 | 1337 | 3 |
| 205 | 0 | 162 | 1 |
| 8 | 0 | 0 | 0 |
| 1940 | 0 | 1828 | |

### NORTHBOUND

| | | | | | | |
|---|---|---|---|---|---|---|
| PM | 481 | 0 | 218 | 44 | 246 | PM |
| NOON | 0 | 0 | 0 | 0 | 0 | NOON |
| AM | 517 | 0 | 158 | 11 | 134 | AM |

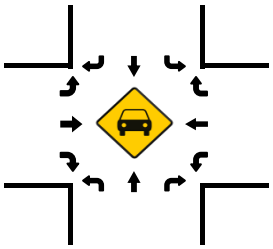
0 1 1 0 | 0 1.5 0.5 1

### Castlegate Ln/Placentia Ave

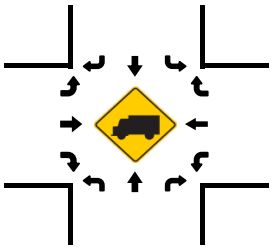
**CONTROL:** Signalized

| | | | |
|---|---|---|---|
| TEV | 3906 | 0 | 4478 |
| | AM | NOON | PM |
| PHF | 0.93 | | 0.94 |

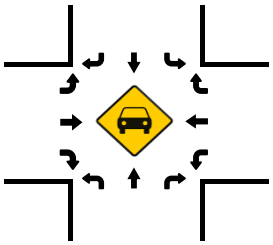
**Total Vehicles (AM)**



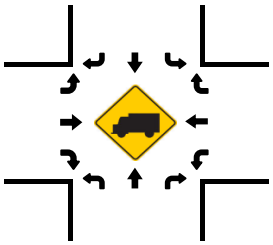
**2axle (AM)**



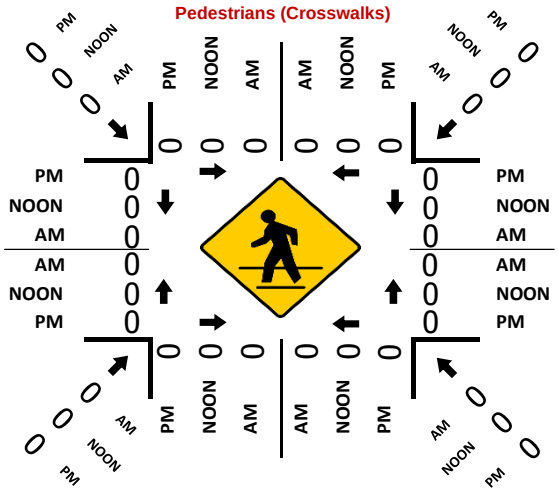
**Total Vehicles (Noon)**



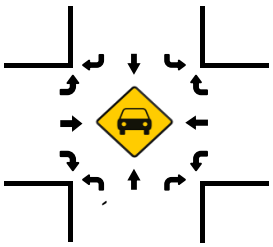
**2axle (NOON)**



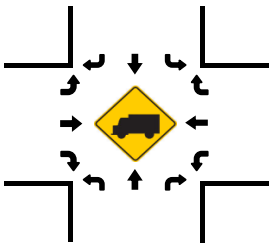
**Pedestrians (Crosswalks)**




**Total Vehicles (PM)**



**2axle (PM)**



# INTERSECTION TURNING MOVEMENT COUNTS

T418

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Sat, May 18, 19

LOCATION: Brea
NORTH & SOUTH: Placentia
EAST & WEST: Imperial

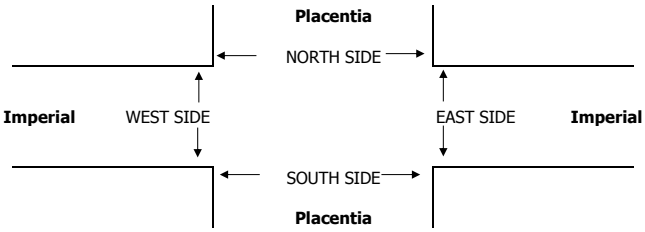
PROJECT #: SC2213
LOCATION #: 5
CONTROL: SIGNAL

NOTES:

AM PM MD OTHER OTHER — N ▲ ◄ W E ► S ▼

☑ Add U-Turns to Left Turns

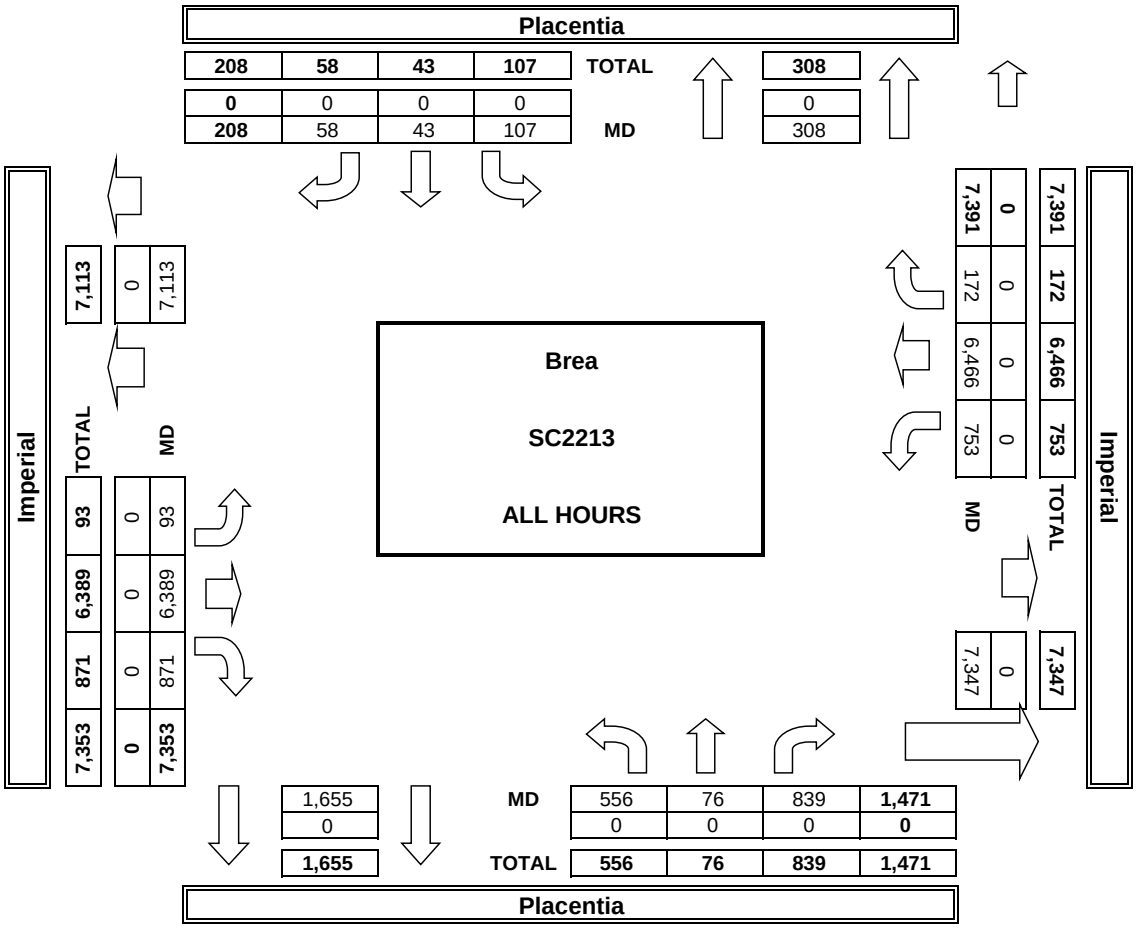
| | | NORTHBOUND Placentia | | | SOUTHBOUND Placentia | | | EASTBOUND Imperial | | | WESTBOUND Imperial | | | | U-TURNS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LANES: | NL 1.5 | NT 0.5 | NR 1 | SL 1 | ST 1 | SR 0 | EL 1 | ET 3 | ER 1 | WL 1 | WT 3 | WR 0 | TOTAL | NB 0 | SB 0 | EB 0 | WB 0 | TTL |
| MD | 11:00 AM | 47 | 6 | 56 | 9 | 3 | 4 | 8 | 375 | 41 | 46 | 414 | 9 | 1,018 | 0 | 0 | 1 | 0 | 1 |
| | 11:15 AM | 36 | 8 | 53 | 9 | 0 | 4 | 4 | 382 | 36 | 38 | 440 | 14 | 1,024 | 0 | 0 | 0 | 0 | 0 |
| | 11:30 AM | 39 | 5 | 48 | 7 | 2 | 2 | 1 | 358 | 40 | 49 | 401 | 7 | 959 | 0 | 0 | 0 | 2 | 2 |
| | 11:45 AM | 31 | 5 | 51 | 5 | 2 | 3 | 10 | 413 | 42 | 50 | 427 | 13 | 1,052 | 0 | 0 | 3 | 1 | 4 |
| | 12:00 PM | 45 | 4 | 48 | 14 | 4 | 2 | 10 | 360 | 49 | 41 | 341 | 9 | 927 | 0 | 0 | 5 | 0 | 5 |
| | 12:15 PM | 40 | 4 | 47 | 4 | 5 | 4 | 6 | 398 | 67 | 55 | 357 | 15 | 1,002 | 0 | 0 | 2 | 1 | 3 |
| | 12:30 PM | 41 | 5 | 56 | 10 | 4 | 7 | 7 | 444 | 69 | 56 | 362 | 15 | 1,076 | 0 | 0 | 3 | 1 | 4 |
| | 12:45 PM | 36 | 4 | 56 | 4 | 4 | 3 | 5 | 473 | 75 | 53 | 388 | 9 | 1,110 | 0 | 0 | 2 | 1 | 3 |
| | 1:00 PM | 34 | 4 | 55 | 6 | 1 | 2 | 8 | 389 | 64 | 48 | 384 | 11 | 1,006 | 0 | 0 | 5 | 1 | 6 |
| | 1:15 PM | 33 | 2 | 56 | 7 | 2 | 3 | 6 | 434 | 46 | 43 | 404 | 10 | 1,046 | 0 | 0 | 2 | 0 | 2 |
| | 1:30 PM | 36 | 6 | 53 | 7 | 3 | 3 | 4 | 424 | 66 | 46 | 458 | 13 | 1,119 | 0 | 0 | 2 | 1 | 3 |
| | 1:45 PM | 28 | 3 | 39 | 6 | 4 | 2 | 6 | 409 | 54 | 49 | 399 | 11 | 1,010 | 0 | 0 | 1 | 1 | 2 |
| | 2:00 PM | 18 | 1 | 51 | 5 | 3 | 6 | 9 | 399 | 61 | 48 | 394 | 16 | 1,011 | 0 | 0 | 3 | 0 | 3 |
| | 2:15 PM | 34 | 5 | 56 | 4 | 1 | 5 | 3 | 353 | 49 | 50 | 466 | 7 | 1,033 | 0 | 0 | 1 | 1 | 2 |
| | 2:30 PM | 29 | 9 | 67 | 5 | 2 | 4 | 3 | 391 | 59 | 42 | 412 | 7 | 1,030 | 0 | 0 | 1 | 1 | 2 |
| | 2:45 PM | 29 | 5 | 47 | 5 | 3 | 4 | 3 | 387 | 53 | 39 | 419 | 6 | 1,000 | 0 | 0 | 2 | 1 | 3 |
| | VOLUMES | 556 | 76 | 839 | 107 | 43 | 58 | 93 | 6,389 | 871 | 753 | 6,466 | 172 | 16,423 | 0 | 0 | 33 | 12 | 45 |
| | APPROACH % | 38% | 5% | 57% | 51% | 21% | 28% | 1% | 87% | 12% | 10% | 87% | 2% | | | | | | |
| | APP/DEPART | 1,471 | / | 308 | 208 | / | 1,655 | 7,353 | / | 7,347 | 7,391 | / | 7,113 | 0 | | | | | |
| | BEGIN PEAK HR | | 12:45 PM | | | | | | | | | | | | | | | | |
| | VOLUMES | 139 | 16 | 220 | 24 | 10 | 11 | 23 | 1,720 | 251 | 190 | 1,634 | 43 | 4,281 | | | | | |
| | APPROACH % | 37% | 4% | 59% | 53% | 22% | 24% | 1% | 86% | 13% | 10% | 88% | 2% | | | | | | |
| | PEAK HR FACTOR | | 0.977 | | | 0.865 | | | 0.901 | | | 0.903 | | 0.956 | | | | | |
| | APP/DEPART | 375 | / | 71 | 45 | / | 448 | 1,994 | / | 1,967 | 1,867 | / | 1,795 | 0 | | | | | |

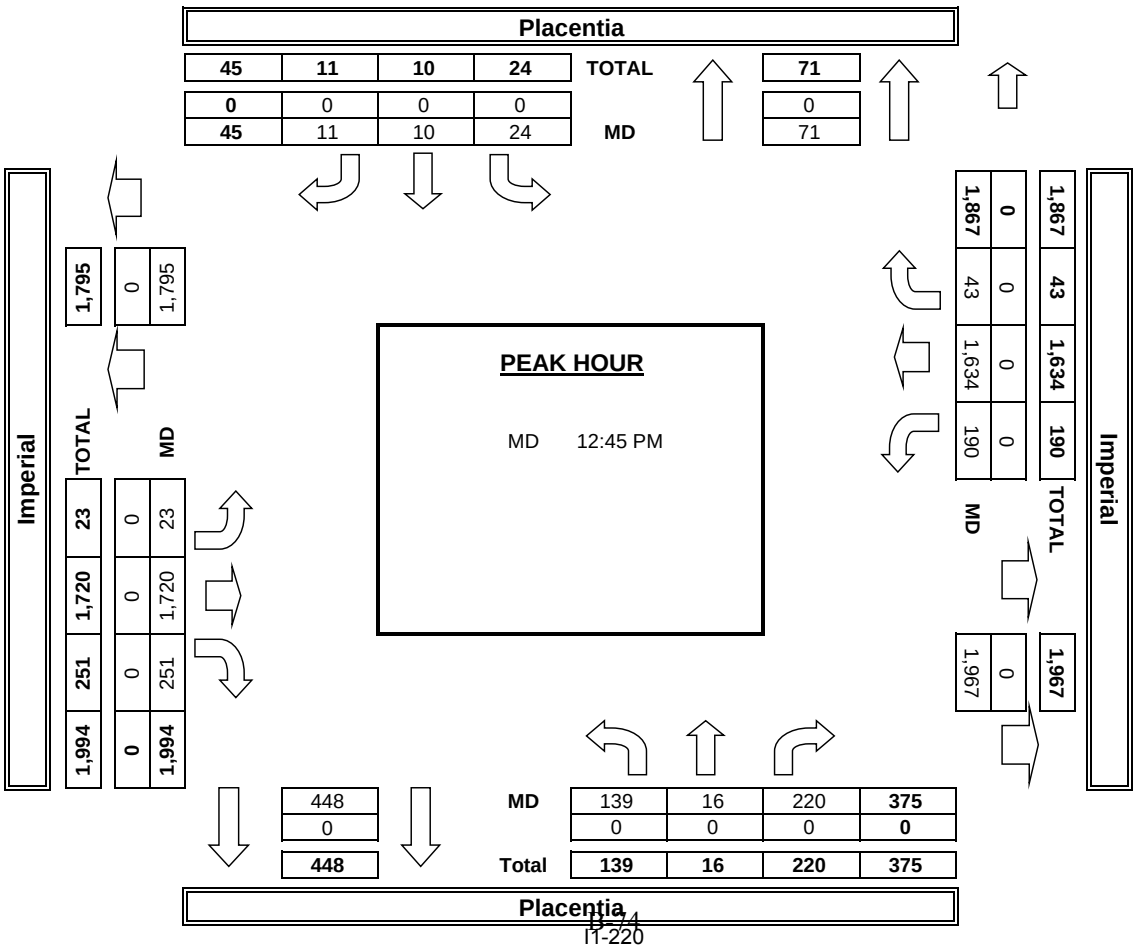



| | | PEDESTRIAN + BIKE CROSSINGS | | | | | PEDESTRIAN CROSSINGS | | | | | BICYCLE CROSSINGS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | N SIDE | S SIDE | E SIDE | W SIDE | TOTAL | NS | SS | ES | WS | TOTAL |
| MD | 11:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 11:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 11:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 11:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | AM BEGIN PEAK HR | 12:45 PM | | | | | 0 | 0 | 0 | 0 | 0 | | | | | |

**AimTD LLC**

TURNING MOVEMENT COUNTS



*APPENDIX B-II*

# EXISTING ROADWAY SEGMENT TRAFFIC COUNT DATA

Prepared by NDS/ATD

# VOLUME

Lambert Rd E/O N Brea Blvd

**Day:** Thursday
**Date:** 4/19/2018

**City:** Brea
**Project #:** CA18_1082_003

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 18,008 | 18,780 | 36,788 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 43 | | 43 | | 86 | | 12:00 | | | 292 | | 251 | | 543 | |
| 00:15 | | | 32 | | 27 | | 59 | | 12:15 | | | 269 | | 225 | | 494 | |
| 00:30 | | | 29 | | 32 | | 61 | | 12:30 | | | 312 | | 261 | | 573 | |
| 00:45 | | | 29 | 133 | 22 | 124 | 51 | 257 | 12:45 | | | 306 | 1179 | 299 | 1036 | 605 | 2215 |
| 01:00 | | | 18 | | 31 | | 49 | | 13:00 | | | 268 | | 243 | | 511 | |
| 01:15 | | | 24 | | 13 | | 37 | | 13:15 | | | 270 | | 248 | | 518 | |
| 01:30 | | | 57 | | 23 | | 80 | | 13:30 | | | 353 | | 276 | | 629 | |
| 01:45 | | | 58 | 157 | 16 | 83 | 74 | 240 | 13:45 | | | 311 | 1202 | 260 | 1027 | 571 | 2229 |
| 02:00 | | | 38 | | 12 | | 50 | | 14:00 | | | 286 | | 238 | | 524 | |
| 02:15 | | | 22 | | 15 | | 37 | | 14:15 | | | 294 | | 264 | | 558 | |
| 02:30 | | | 28 | | 22 | | 50 | | 14:30 | | | 366 | | 306 | | 672 | |
| 02:45 | | | 19 | 107 | 30 | 79 | 49 | 186 | 14:45 | | | 275 | 1221 | 334 | 1142 | 609 | 2363 |
| 03:00 | | | 18 | | 29 | | 47 | | 15:00 | | | 295 | | 282 | | 577 | |
| 03:15 | | | 23 | | 35 | | 58 | | 15:15 | | | 311 | | 273 | | 584 | |
| 03:30 | | | 52 | | 76 | | 128 | | 15:30 | | | 318 | | 305 | | 623 | |
| 03:45 | | | 53 | 146 | 62 | 202 | 115 | 348 | 15:45 | | | 329 | 1253 | 367 | 1227 | 696 | 2480 |
| 04:00 | | | 33 | | 36 | | 69 | | 16:00 | | | 305 | | 333 | | 638 | |
| 04:15 | | | 43 | | 57 | | 100 | | 16:15 | | | 288 | | 389 | | 677 | |
| 04:30 | | | 78 | | 110 | | 188 | | 16:30 | | | 341 | | 368 | | 709 | |
| 04:45 | | | 139 | 293 | 131 | 334 | 270 | 627 | 16:45 | | | 344 | 1278 | 384 | 1474 | 728 | 2752 |
| 05:00 | | | 103 | | 95 | | 198 | | 17:00 | | | 362 | | 364 | | 726 | |
| 05:15 | | | 113 | | 117 | | 230 | | 17:15 | | | 338 | | 412 | | 750 | |
| 05:30 | | | 136 | | 178 | | 314 | | 17:30 | | | 327 | | 398 | | 725 | |
| 05:45 | | | 141 | 493 | 186 | 576 | 327 | 1069 | 17:45 | | | 309 | 1336 | 377 | 1551 | 686 | 2887 |
| 06:00 | | | 132 | | 147 | | 279 | | 18:00 | | | 304 | | 316 | | 620 | |
| 06:15 | | | 156 | | 186 | | 342 | | 18:15 | | | 292 | | 315 | | 607 | |
| 06:30 | | | 209 | | 212 | | 421 | | 18:30 | | | 276 | | 293 | | 569 | |
| 06:45 | | | 253 | 750 | 315 | 860 | 568 | 1610 | 18:45 | | | 257 | 1129 | 301 | 1225 | 558 | 2354 |
| 07:00 | | | 232 | | 304 | | 536 | | 19:00 | | | 216 | | 288 | | 504 | |
| 07:15 | | | 257 | | 332 | | 589 | | 19:15 | | | 232 | | 240 | | 472 | |
| 07:30 | | | 334 | | 305 | | 639 | | 19:30 | | | 221 | | 211 | | 432 | |
| 07:45 | | | 312 | 1135 | 397 | 1338 | 709 | 2473 | 19:45 | | | 239 | 908 | 195 | 934 | 434 | 1842 |
| 08:00 | | | 301 | | 364 | | 665 | | 20:00 | | | 207 | | 170 | | 377 | |
| 08:15 | | | 227 | | 255 | | 482 | | 20:15 | | | 180 | | 177 | | 357 | |
| 08:30 | | | 233 | | 291 | | 524 | | 20:30 | | | 157 | | 106 | | 263 | |
| 08:45 | | | 254 | 1015 | 260 | 1170 | 514 | 2185 | 20:45 | | | 118 | 662 | 153 | 606 | 271 | 1268 |
| 09:00 | | | 215 | | 253 | | 468 | | 21:00 | | | 150 | | 140 | | 290 | |
| 09:15 | | | 225 | | 238 | | 463 | | 21:15 | | | 135 | | 143 | | 278 | |
| 09:30 | | | 179 | | 267 | | 446 | | 21:30 | | | 96 | | 93 | | 189 | |
| 09:45 | | | 208 | 827 | 233 | 991 | 441 | 1818 | 21:45 | | | 109 | 490 | 98 | 474 | 207 | 964 |
| 10:00 | | | 182 | | 235 | | 417 | | 22:00 | | | 112 | | 88 | | 200 | |
| 10:15 | | | 211 | | 262 | | 473 | | 22:15 | | | 81 | | 81 | | 162 | |
| 10:30 | | | 218 | | 223 | | 441 | | 22:30 | | | 103 | | 85 | | 188 | |
| 10:45 | | | 250 | 861 | 226 | 946 | 476 | 1807 | 22:45 | | | 65 | 361 | 62 | 316 | 127 | 677 |
| 11:00 | | | 192 | | 213 | | 405 | | 23:00 | | | 50 | | 49 | | 99 | |
| 11:15 | | | 228 | | 201 | | 429 | | 23:15 | | | 27 | | 36 | | 63 | |
| 11:30 | | | 260 | | 243 | | 503 | | 23:30 | | | 59 | | 40 | | 99 | |
| 11:45 | | | 223 | 903 | 242 | 899 | 465 | 1802 | 23:45 | | | 33 | 169 | 41 | 166 | 74 | 335 |
| TOTALS | | | | 6820 | | 7602 | | 14422 | TOTALS | | | | 11188 | | 11178 | | 22366 |
| SPLIT % | | | | 47.3% | | 52.7% | | 39.2% | SPLIT % | | | | 50.0% | | 50.0% | | 60.8% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 18,008 | 18,780 | 36,788 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 07:15 | 07:15 | 07:15 | PM Peak Hour | | | 16:30 | 16:45 | 16:45 |
| AM Pk Volume | | | 1204 | 1398 | 2602 | PM Pk Volume | | | 1385 | 1558 | 2929 |
| Pk Hr Factor | | | 0.901 | 0.880 | 0.917 | Pk Hr Factor | | | 0.956 | 0.945 | 0.976 |
| 7 - 9 Volume | 0 | 0 | 2150 | 2508 | 4658 | 4 - 6 Volume | 0 | 0 | 2614 | 3025 | 5639 |
| 7 - 9 Peak Hour | | | 07:15 | 07:15 | 07:15 | 4 - 6 Peak Hour | | | 16:30 | 16:45 | 16:45 |
| 7 - 9 Pk Volume | 0 | 0 | 1204 | 1398 | 2602 | 4 - 6 Pk Volume | 0 | 0 | 1385 | 1558 | 2929 |
| Pk Hr Factor | 0.000 | 0.000 | 0.901 | 0.880 | 0.917 | Pk Hr Factor | 0.000 | 0.000 | 0.956 | 0.945 | 0.976 |

Prepared by NDS/ATD

# VOLUME

Lambert Rd W/O Santa Fe Rd/Kraemer Blvd

**Day:** Tuesday
**Date:** 11/13/2018

**City:** Brea
**Project #:** CA18_1232_003

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 18,802 | 14,273 | 33,075 |

| AM Period | NB | | SB | | EB | | WB | | TOTAL | | PM Period | NB | | SB | | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | | | 25 | | 8 | | 33 | | 12:00 | | | | | 191 | | 204 | | 395 | |
| 00:15 | | | | | 20 | | 2 | | 22 | | 12:15 | | | | | 227 | | 175 | | 402 | |
| 00:30 | | | | | 24 | | 8 | | 32 | | 12:30 | | | | | 185 | | 193 | | 378 | |
| 00:45 | | | | | 15 | 84 | 9 | 27 | 24 | 111 | 12:45 | | | | | 183 | 786 | 181 | 753 | 364 | 1539 |
| 01:00 | | | | | 15 | | 6 | | 21 | | 13:00 | | | | | 239 | | 220 | | 459 | |
| 01:15 | | | | | 6 | | 6 | | 12 | | 13:15 | | | | | 220 | | 178 | | 398 | |
| 01:30 | | | | | 14 | | 1 | | 15 | | 13:30 | | | | | 232 | | 241 | | 473 | |
| 01:45 | | | | | 10 | 45 | 1 | 14 | 11 | 59 | 13:45 | | | | | 218 | 909 | 188 | 827 | 406 | 1736 |
| 02:00 | | | | | 5 | | 3 | | 8 | | 14:00 | | | | | 230 | | 197 | | 427 | |
| 02:15 | | | | | 9 | | 9 | | 18 | | 14:15 | | | | | 224 | | 205 | | 429 | |
| 02:30 | | | | | 12 | | 8 | | 20 | | 14:30 | | | | | 258 | | 264 | | 522 | |
| 02:45 | | | | | 4 | 30 | 13 | 33 | 17 | 63 | 14:45 | | | | | 329 | 1041 | 220 | 886 | 549 | 1927 |
| 03:00 | | | | | 8 | | 5 | | 13 | | 15:00 | | | | | 320 | | 216 | | 536 | |
| 03:15 | | | | | 9 | | 7 | | 16 | | 15:15 | | | | | 337 | | 230 | | 567 | |
| 03:30 | | | | | 11 | | 14 | | 25 | | 15:30 | | | | | 383 | | 242 | | 625 | |
| 03:45 | | | | | 12 | 40 | 13 | 39 | 25 | 79 | 15:45 | | | | | 366 | 1406 | 243 | 931 | 609 | 2337 |
| 04:00 | | | | | 19 | | 22 | | 41 | | 16:00 | | | | | 374 | | 286 | | 660 | |
| 04:15 | | | | | 35 | | 35 | | 70 | | 16:15 | | | | | 346 | | 271 | | 617 | |
| 04:30 | | | | | 55 | | 57 | | 112 | | 16:30 | | | | | 423 | | 305 | | 728 | |
| 04:45 | | | | | 99 | 208 | 80 | 194 | 179 | 402 | 16:45 | | | | | 417 | 1560 | 291 | 1153 | 708 | 2713 |
| 05:00 | | | | | 53 | | 95 | | 148 | | 17:00 | | | | | 407 | | 326 | | 733 | |
| 05:15 | | | | | 81 | | 152 | | 233 | | 17:15 | | | | | 398 | | 243 | | 641 | |
| 05:30 | | | | | 126 | | 195 | | 321 | | 17:30 | | | | | 397 | | 223 | | 620 | |
| 05:45 | | | | | 208 | 468 | 173 | 615 | 381 | 1083 | 17:45 | | | | | 447 | 1649 | 230 | 1022 | 677 | 2671 |
| 06:00 | | | | | 164 | | 185 | | 349 | | 18:00 | | | | | 390 | | 249 | | 639 | |
| 06:15 | | | | | 232 | | 165 | | 397 | | 18:15 | | | | | 342 | | 235 | | 577 | |
| 06:30 | | | | | 326 | | 213 | | 539 | | 18:30 | | | | | 398 | | 201 | | 599 | |
| 06:45 | | | | | 442 | 1164 | 267 | 830 | 709 | 1994 | 18:45 | | | | | 308 | 1438 | 176 | 861 | 484 | 2299 |
| 07:00 | | | | | 358 | | 207 | | 565 | | 19:00 | | | | | 311 | | 134 | | 445 | |
| 07:15 | | | | | 417 | | 249 | | 666 | | 19:15 | | | | | 273 | | 113 | | 386 | |
| 07:30 | | | | | 400 | | 301 | | 701 | | 19:30 | | | | | 211 | | 115 | | 326 | |
| 07:45 | | | | | 412 | 1587 | 318 | 1075 | 730 | 2662 | 19:45 | | | | | 200 | 995 | 87 | 449 | 287 | 1444 |
| 08:00 | | | | | 462 | | 340 | | 802 | | 20:00 | | | | | 185 | | 163 | | 348 | |
| 08:15 | | | | | 368 | | 312 | | 680 | | 20:15 | | | | | 160 | | 153 | | 313 | |
| 08:30 | | | | | 368 | | 283 | | 651 | | 20:30 | | | | | 146 | | 101 | | 247 | |
| 08:45 | | | | | 341 | 1539 | 287 | 1222 | 628 | 2761 | 20:45 | | | | | 159 | 650 | 66 | 483 | 225 | 1133 |
| 09:00 | | | | | 289 | | 239 | | 528 | | 21:00 | | | | | 135 | | 71 | | 206 | |
| 09:15 | | | | | 212 | | 268 | | 480 | | 21:15 | | | | | 124 | | 79 | | 203 | |
| 09:30 | | | | | 201 | | 255 | | 456 | | 21:30 | | | | | 79 | | 41 | | 120 | |
| 09:45 | | | | | 184 | 886 | 225 | 987 | 409 | 1873 | 21:45 | | | | | 72 | 410 | 42 | 233 | 114 | 643 |
| 10:00 | | | | | 188 | | 236 | | 424 | | 22:00 | | | | | 81 | | 40 | | 121 | |
| 10:15 | | | | | 175 | | 171 | | 346 | | 22:15 | | | | | 59 | | 37 | | 96 | |
| 10:30 | | | | | 188 | | 161 | | 349 | | 22:30 | | | | | 67 | | 22 | | 89 | |
| 10:45 | | | | | 187 | 738 | 171 | 739 | 358 | 1477 | 22:45 | | | | | 48 | 255 | 23 | 122 | 71 | 377 |
| 11:00 | | | | | 201 | | 169 | | 370 | | 23:00 | | | | | 42 | | 35 | | 77 | |
| 11:15 | | | | | 182 | | 187 | | 369 | | 23:15 | | | | | 29 | | 19 | | 48 | |
| 11:30 | | | | | 196 | | 163 | | 359 | | 23:30 | | | | | 33 | | 25 | | 58 | |
| 11:45 | | | | | 208 | 787 | 162 | 681 | 370 | 1468 | 23:45 | | | | | 23 | 127 | 18 | 97 | 41 | 224 |
| TOTALS | | | | | | 7576 | | 6456 | | 14032 | TOTALS | | | | | | 11226 | | 7817 | | 19043 |
| SPLIT % | | | | | | 54.0% | | 46.0% | | 42.4% | SPLIT % | | | | | | 59.0% | | 41.0% | | 57.6% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 18,802 | 14,273 | 33,075 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 07:15 | 07:30 | 07:30 | PM Peak Hour | | | 17:00 | 16:15 | 16:30 |
| AM Pk Volume | | | 1691 | 1271 | 2913 | PM Pk Volume | | | 1649 | 1193 | 2810 |
| Pk Hr Factor | | | 0.915 | 0.935 | 0.908 | Pk Hr Factor | | | 0.922 | 0.915 | 0.958 |
| 7 - 9 Volume | 0 | 0 | 3126 | 2297 | 5423 | 4 - 6 Volume | 0 | 0 | 3209 | 2175 | 5384 |
| 7 - 9 Peak Hour | | | 07:15 | 07:30 | 07:30 | 4 - 6 Peak Hour | | | 17:00 | 16:15 | 16:30 |
| 7 - 9 Pk Volume | 0 | 0 | 1691 | 1271 | 2913 | 4 - 6 Pk Volume | 0 | 0 | 1649 | 1193 | 2810 |
| Pk Hr Factor | 0.000 | 0.000 | 0.915 | 0.935 | 0.908 | Pk Hr Factor | 0.000 | 0.000 | 0.922 | 0.915 | 0.958 |

Prepared by NDS/ATD

# VOLUME

Birch St E/O Brea Blvd

**Day:** Thursday
**Date:** 4/19/2018

**City:** Brea
**Project #:** CA18_1082_007

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 7,982 | 9,630 | 17,612 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 10 | | 19 | | 29 | | 12:00 | | | 152 | | 162 | | 314 | |
| 00:15 | | | 7 | | 10 | | 17 | | 12:15 | | | 154 | | 185 | | 339 | |
| 00:30 | | | 12 | | 4 | | 16 | | 12:30 | | | 130 | | 183 | | 313 | |
| 00:45 | | | 3 | 32 | 11 | 44 | 14 | 76 | 12:45 | | | 128 | 564 | 244 | 774 | 372 | 1338 |
| 01:00 | | | 4 | | 6 | | 10 | | 13:00 | | | 120 | | 178 | | 298 | |
| 01:15 | | | 3 | | 5 | | 8 | | 13:15 | | | 128 | | 152 | | 280 | |
| 01:30 | | | 0 | | 6 | | 6 | | 13:30 | | | 136 | | 138 | | 274 | |
| 01:45 | | | 1 | 8 | 0 | 17 | 1 | 25 | 13:45 | | | 138 | 522 | 176 | 644 | 314 | 1166 |
| 02:00 | | | 0 | | 3 | | 3 | | 14:00 | | | 127 | | 201 | | 328 | |
| 02:15 | | | 2 | | 2 | | 4 | | 14:15 | | | 168 | | 166 | | 334 | |
| 02:30 | | | 2 | | 1 | | 3 | | 14:30 | | | 123 | | 135 | | 258 | |
| 02:45 | | | 1 | 5 | 1 | 7 | 2 | 12 | 14:45 | | | 129 | 547 | 225 | 727 | 354 | 1274 |
| 03:00 | | | 1 | | 2 | | 3 | | 15:00 | | | 165 | | 216 | | 381 | |
| 03:15 | | | 5 | | 2 | | 7 | | 15:15 | | | 153 | | 196 | | 349 | |
| 03:30 | | | 3 | | 3 | | 6 | | 15:30 | | | 152 | | 216 | | 368 | |
| 03:45 | | | 5 | 14 | 4 | 11 | 9 | 25 | 15:45 | | | 172 | 642 | 230 | 858 | 402 | 1500 |
| 04:00 | | | 3 | | 2 | | 5 | | 16:00 | | | 156 | | 204 | | 360 | |
| 04:15 | | | 4 | | 6 | | 10 | | 16:15 | | | 163 | | 239 | | 402 | |
| 04:30 | | | 6 | | 8 | | 14 | | 16:30 | | | 156 | | 216 | | 372 | |
| 04:45 | | | 12 | 25 | 13 | 29 | 25 | 54 | 16:45 | | | 191 | 666 | 210 | 869 | 401 | 1535 |
| 05:00 | | | 16 | | 17 | | 33 | | 17:00 | | | 177 | | 229 | | 406 | |
| 05:15 | | | 12 | | 20 | | 32 | | 17:15 | | | 181 | | 227 | | 408 | |
| 05:30 | | | 25 | | 20 | | 45 | | 17:30 | | | 152 | | 224 | | 376 | |
| 05:45 | | | 34 | 87 | 39 | 96 | 73 | 183 | 17:45 | | | 148 | 658 | 223 | 903 | 371 | 1561 |
| 06:00 | | | 32 | | 32 | | 64 | | 18:00 | | | 163 | | 196 | | 359 | |
| 06:15 | | | 26 | | 32 | | 58 | | 18:15 | | | 136 | | 160 | | 296 | |
| 06:30 | | | 74 | | 82 | | 156 | | 18:30 | | | 144 | | 169 | | 313 | |
| 06:45 | | | 62 | 194 | 91 | 237 | 153 | 431 | 18:45 | | | 141 | 584 | 145 | 670 | 286 | 1254 |
| 07:00 | | | 76 | | 90 | | 166 | | 19:00 | | | 130 | | 161 | | 291 | |
| 07:15 | | | 90 | | 103 | | 193 | | 19:15 | | | 140 | | 136 | | 276 | |
| 07:30 | | | 151 | | 128 | | 279 | | 19:30 | | | 104 | | 168 | | 272 | |
| 07:45 | | | 165 | 482 | 180 | 501 | 345 | 983 | 19:45 | | | 87 | 461 | 125 | 590 | 212 | 1051 |
| 08:00 | | | 121 | | 116 | | 237 | | 20:00 | | | 85 | | 105 | | 190 | |
| 08:15 | | | 109 | | 100 | | 209 | | 20:15 | | | 78 | | 131 | | 209 | |
| 08:30 | | | 92 | | 95 | | 187 | | 20:30 | | | 81 | | 75 | | 156 | |
| 08:45 | | | 119 | 441 | 123 | 434 | 242 | 875 | 20:45 | | | 67 | 311 | 87 | 398 | 154 | 709 |
| 09:00 | | | 71 | | 88 | | 159 | | 21:00 | | | 83 | | 86 | | 169 | |
| 09:15 | | | 101 | | 101 | | 202 | | 21:15 | | | 49 | | 55 | | 104 | |
| 09:30 | | | 75 | | 82 | | 157 | | 21:30 | | | 71 | | 48 | | 119 | |
| 09:45 | | | 106 | 353 | 116 | 387 | 222 | 740 | 21:45 | | | 70 | 273 | 45 | 234 | 115 | 507 |
| 10:00 | | | 74 | | 101 | | 175 | | 22:00 | | | 58 | | 35 | | 93 | |
| 10:15 | | | 93 | | 85 | | 178 | | 22:15 | | | 35 | | 30 | | 65 | |
| 10:30 | | | 101 | | 121 | | 222 | | 22:30 | | | 32 | | 32 | | 64 | |
| 10:45 | | | 116 | 384 | 132 | 439 | 248 | 823 | 22:45 | | | 15 | 140 | 29 | 126 | 44 | 266 |
| 11:00 | | | 118 | | 140 | | 258 | | 23:00 | | | 19 | | 13 | | 32 | |
| 11:15 | | | 138 | | 140 | | 278 | | 23:15 | | | 18 | | 13 | | 31 | |
| 11:30 | | | 129 | | 138 | | 267 | | 23:30 | | | 11 | | 13 | | 24 | |
| 11:45 | | | 145 | 530 | 168 | 586 | 313 | 1116 | 23:45 | | | 11 | 59 | 10 | 49 | 21 | 108 |
| TOTALS | | | | 2555 | | 2788 | | 5343 | TOTALS | | | | 5427 | | 6842 | | 12269 |
| SPLIT % | | | | 47.8% | | 52.2% | | 30.3% | SPLIT % | | | | 44.2% | | 55.8% | | 69.7% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 7,982 | 9,630 | 17,612 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 11:45 | 11:45 | 11:45 | PM Peak Hour | | | 16:30 | 17:00 | 16:45 |
| AM Pk Volume | | | 581 | 698 | 1279 | PM Pk Volume | | | 705 | 903 | 1591 |
| Pk Hr Factor | | | 0.943 | 0.943 | 0.943 | Pk Hr Factor | | | 0.923 | 0.986 | 0.975 |
| 7 - 9 Volume | 0 | 0 | 923 | 935 | 1858 | 4 - 6 Volume | 0 | 0 | 1324 | 1772 | 3096 |
| 7 - 9 Peak Hour | | | 07:30 | 07:15 | 07:30 | 4 - 6 Peak Hour | | | 16:30 | 17:00 | 16:45 |
| 7 - 9 Pk Volume | 0 | 0 | 546 | 527 | 1070 | 4 - 6 Pk Volume | 0 | 0 | 705 | 903 | 1591 |
| Pk Hr Factor | 0.000 | 0.000 | 0.827 | 0.732 | 0.775 | Pk Hr Factor | 0.000 | 0.000 | 0.923 | 0.986 | 0.975 |

Prepared by NDS/ATD

# VOLUME

Birch St E/O Randolph Ave

**Day:** Thursday
**Date:** 5/16/2019

**City:** Brea
**Project #:** CA19_1100_001

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 9,018 | 10,323 | 19,341 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 14 | | 16 | | 30 | | 12:00 | | | 142 | | 175 | | 317 | |
| 00:15 | | | 6 | | 6 | | 12 | | 12:15 | | | 148 | | 167 | | 315 | |
| 00:30 | | | 4 | | 9 | | 13 | | 12:30 | | | 159 | | 163 | | 322 | |
| 00:45 | | | 1 | 25 | 7 | 38 | 8 | 63 | 12:45 | | | 159 | 608 | 183 | 688 | 342 | 1296 |
| 01:00 | | | 4 | | 8 | | 12 | | 13:00 | | | 161 | | 168 | | 329 | |
| 01:15 | | | 4 | | 7 | | 11 | | 13:15 | | | 161 | | 190 | | 351 | |
| 01:30 | | | 4 | | 0 | | 4 | | 13:30 | | | 161 | | 160 | | 321 | |
| 01:45 | | | 3 | 15 | 3 | 18 | 6 | 33 | 13:45 | | | 159 | 642 | 192 | 710 | 351 | 1352 |
| 02:00 | | | 1 | | 1 | | 2 | | 14:00 | | | 137 | | 202 | | 339 | |
| 02:15 | | | 3 | | 8 | | 11 | | 14:15 | | | 180 | | 183 | | 363 | |
| 02:30 | | | 3 | | 4 | | 7 | | 14:30 | | | 160 | | 176 | | 336 | |
| 02:45 | | | 5 | 12 | 2 | 15 | 7 | 27 | 14:45 | | | 142 | 619 | 270 | 831 | 412 | 1450 |
| 03:00 | | | 2 | | 7 | | 9 | | 15:00 | | | 161 | | 237 | | 398 | |
| 03:15 | | | 8 | | 5 | | 13 | | 15:15 | | | 174 | | 207 | | 381 | |
| 03:30 | | | 9 | | 2 | | 11 | | 15:30 | | | 174 | | 204 | | 378 | |
| 03:45 | | | 14 | 33 | 10 | 24 | 24 | 57 | 15:45 | | | 178 | 687 | 221 | 869 | 399 | 1556 |
| 04:00 | | | 8 | | 4 | | 12 | | 16:00 | | | 159 | | 238 | | 397 | |
| 04:15 | | | 7 | | 4 | | 11 | | 16:15 | | | 175 | | 275 | | 450 | |
| 04:30 | | | 9 | | 9 | | 18 | | 16:30 | | | 180 | | 250 | | 430 | |
| 04:45 | | | 18 | 42 | 7 | 24 | 25 | 66 | 16:45 | | | 197 | 711 | 270 | 1033 | 467 | 1744 |
| 05:00 | | | 11 | | 11 | | 22 | | 17:00 | | | 206 | | 268 | | 474 | |
| 05:15 | | | 25 | | 14 | | 39 | | 17:15 | | | 177 | | 283 | | 460 | |
| 05:30 | | | 20 | | 20 | | 40 | | 17:30 | | | 184 | | 252 | | 436 | |
| 05:45 | | | 44 | 100 | 38 | 83 | 82 | 183 | 17:45 | | | 168 | 735 | 268 | 1071 | 436 | 1806 |
| 06:00 | | | 33 | | 42 | | 75 | | 18:00 | | | 170 | | 210 | | 380 | |
| 06:15 | | | 42 | | 44 | | 86 | | 18:15 | | | 161 | | 191 | | 352 | |
| 06:30 | | | 97 | | 44 | | 141 | | 18:30 | | | 155 | | 186 | | 341 | |
| 06:45 | | | 107 | 279 | 81 | 211 | 188 | 490 | 18:45 | | | 134 | 620 | 196 | 783 | 330 | 1403 |
| 07:00 | | | 108 | | 60 | | 168 | | 19:00 | | | 141 | | 171 | | 312 | |
| 07:15 | | | 117 | | 84 | | 201 | | 19:15 | | | 116 | | 156 | | 272 | |
| 07:30 | | | 189 | | 113 | | 302 | | 19:30 | | | 135 | | 134 | | 269 | |
| 07:45 | | | 198 | 612 | 184 | 441 | 382 | 1053 | 19:45 | | | 100 | 492 | 122 | 583 | 222 | 1075 |
| 08:00 | | | 160 | | 154 | | 314 | | 20:00 | | | 106 | | 118 | | 224 | |
| 08:15 | | | 122 | | 103 | | 225 | | 20:15 | | | 107 | | 112 | | 219 | |
| 08:30 | | | 115 | | 122 | | 237 | | 20:30 | | | 79 | | 112 | | 191 | |
| 08:45 | | | 107 | 504 | 116 | 495 | 223 | 999 | 20:45 | | | 88 | 380 | 109 | 451 | 197 | 831 |
| 09:00 | | | 97 | | 103 | | 200 | | 21:00 | | | 79 | | 110 | | 189 | |
| 09:15 | | | 111 | | 79 | | 190 | | 21:15 | | | 75 | | 91 | | 166 | |
| 09:30 | | | 97 | | 92 | | 189 | | 21:30 | | | 58 | | 64 | | 122 | |
| 09:45 | | | 115 | 420 | 98 | 372 | 213 | 792 | 21:45 | | | 45 | 257 | 64 | 329 | 109 | 586 |
| 10:00 | | | 133 | | 104 | | 237 | | 22:00 | | | 57 | | 54 | | 111 | |
| 10:15 | | | 121 | | 108 | | 229 | | 22:15 | | | 23 | | 43 | | 66 | |
| 10:30 | | | 104 | | 103 | | 207 | | 22:30 | | | 32 | | 28 | | 60 | |
| 10:45 | | | 126 | 484 | 113 | 428 | 239 | 912 | 22:45 | | | 24 | 136 | 31 | 156 | 55 | 292 |
| 11:00 | | | 125 | | 137 | | 262 | | 23:00 | | | 19 | | 42 | | 61 | |
| 11:15 | | | 122 | | 139 | | 261 | | 23:15 | | | 18 | | 16 | | 34 | |
| 11:30 | | | 121 | | 149 | | 270 | | 23:30 | | | 10 | | 10 | | 20 | |
| 11:45 | | | 169 | 537 | 163 | 588 | 332 | 1125 | 23:45 | | | 21 | 68 | 14 | 82 | 35 | 150 |
| **TOTALS** | | | | 3063 | | 2737 | | **5800** | **TOTALS** | | | | 5955 | | 7586 | | **13541** |
| **SPLIT %** | | | | 52.8% | | 47.2% | | **30.0%** | **SPLIT %** | | | | 44.0% | | 56.0% | | **70.0%** |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 9,018 | 10,323 | 19,341 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM Peak Hour** | | | 07:30 | 11:45 | **11:45** | **PM Peak Hour** | | | 16:45 | 16:45 | **16:45** |
| **AM Pk Volume** | | | 669 | 668 | **1286** | **PM Pk Volume** | | | 764 | 1073 | **1837** |
| **Pk Hr Factor** | | | 0.845 | 0.954 | **0.968** | **Pk Hr Factor** | | | 0.927 | 0.948 | **0.969** |
| **7 - 9 Volume** | 0 | 0 | 1116 | 936 | **2052** | **4 - 6 Volume** | 0 | 0 | 1446 | 2104 | **3550** |
| **7 - 9 Peak Hour** | | | 07:30 | 07:45 | **07:30** | **4 - 6 Peak Hour** | | | 16:45 | 16:45 | **16:45** |
| **7 - 9 Pk Volume** | 0 | 0 | 669 | 563 | **1223** | **4 - 6 Pk Volume** | 0 | 0 | 764 | 1073 | **1837** |
| **Pk Hr Factor** | 0.000 | 0.000 | 0.845 | 0.765 | **0.800** | **Pk Hr Factor** | 0.000 | 0.000 | 0.927 | 0.948 | **0.969** |

Prepared by NDS/ATD

# VOLUME

Birch St E/O Randolph Ave

**Day:** Saturday
**Date:** 5/18/2019

**City:** Brea
**Project #:** CA19_1100_001

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 8,068 | 9,284 | 17,352 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 17 | | 22 | | 39 | | 12:00 | | | 179 | | 221 | | 400 | |
| 00:15 | | | 19 | | 22 | | 41 | | 12:15 | | | 166 | | 219 | | 385 | |
| 00:30 | | | 10 | | 18 | | 28 | | 12:30 | | | 194 | | 208 | | 402 | |
| 00:45 | | | 8 | 54 | 11 | 73 | 19 | 127 | 12:45 | | | 185 | 724 | 195 | 843 | 380 | 1567 |
| 01:00 | | | 12 | | 11 | | 23 | | 13:00 | | | 174 | | 217 | | 391 | |
| 01:15 | | | 7 | | 10 | | 17 | | 13:15 | | | 164 | | 185 | | 349 | |
| 01:30 | | | 10 | | 5 | | 15 | | 13:30 | | | 187 | | 185 | | 372 | |
| 01:45 | | | 8 | 37 | 7 | 33 | 15 | 70 | 13:45 | | | 173 | 698 | 184 | 771 | 357 | 1469 |
| 02:00 | | | 6 | | 3 | | 9 | | 14:00 | | | 160 | | 168 | | 328 | |
| 02:15 | | | 3 | | 12 | | 15 | | 14:15 | | | 160 | | 214 | | 374 | |
| 02:30 | | | 9 | | 3 | | 12 | | 14:30 | | | 167 | | 177 | | 344 | |
| 02:45 | | | 2 | 20 | 3 | 21 | 5 | 41 | 14:45 | | | 164 | 651 | 212 | 771 | 376 | 1422 |
| 03:00 | | | 3 | | 1 | | 4 | | 15:00 | | | 155 | | 224 | | 379 | |
| 03:15 | | | 6 | | 3 | | 9 | | 15:15 | | | 163 | | 184 | | 347 | |
| 03:30 | | | 2 | | 2 | | 4 | | 15:30 | | | 155 | | 210 | | 365 | |
| 03:45 | | | 5 | 16 | 4 | 10 | 9 | 26 | 15:45 | | | 158 | 631 | 192 | 810 | 350 | 1441 |
| 04:00 | | | 5 | | 4 | | 9 | | 16:00 | | | 150 | | 194 | | 344 | |
| 04:15 | | | 3 | | 0 | | 3 | | 16:15 | | | 141 | | 191 | | 332 | |
| 04:30 | | | 7 | | 5 | | 12 | | 16:30 | | | 142 | | 157 | | 299 | |
| 04:45 | | | 9 | 24 | 4 | 13 | 13 | 37 | 16:45 | | | 165 | 598 | 188 | 730 | 353 | 1328 |
| 05:00 | | | 5 | | 6 | | 11 | | 17:00 | | | 120 | | 187 | | 307 | |
| 05:15 | | | 11 | | 7 | | 18 | | 17:15 | | | 141 | | 186 | | 327 | |
| 05:30 | | | 14 | | 11 | | 25 | | 17:30 | | | 143 | | 134 | | 277 | |
| 05:45 | | | 21 | 51 | 12 | 36 | 33 | 87 | 17:45 | | | 115 | 519 | 162 | 669 | 277 | 1188 |
| 06:00 | | | 9 | | 13 | | 22 | | 18:00 | | | 134 | | 160 | | 294 | |
| 06:15 | | | 27 | | 16 | | 43 | | 18:15 | | | 118 | | 160 | | 278 | |
| 06:30 | | | 23 | | 20 | | 43 | | 18:30 | | | 117 | | 155 | | 272 | |
| 06:45 | | | 35 | 94 | 30 | 79 | 65 | 173 | 18:45 | | | 133 | 502 | 161 | 636 | 294 | 1138 |
| 07:00 | | | 22 | | 24 | | 46 | | 19:00 | | | 132 | | 129 | | 261 | |
| 07:15 | | | 44 | | 32 | | 76 | | 19:15 | | | 101 | | 145 | | 246 | |
| 07:30 | | | 38 | | 42 | | 80 | | 19:30 | | | 87 | | 145 | | 232 | |
| 07:45 | | | 62 | 166 | 49 | 147 | 111 | 313 | 19:45 | | | 88 | 408 | 126 | 545 | 214 | 953 |
| 08:00 | | | 65 | | 40 | | 105 | | 20:00 | | | 96 | | 120 | | 216 | |
| 08:15 | | | 55 | | 56 | | 111 | | 20:15 | | | 91 | | 109 | | 200 | |
| 08:30 | | | 90 | | 78 | | 168 | | 20:30 | | | 77 | | 104 | | 181 | |
| 08:45 | | | 109 | 319 | 94 | 268 | 203 | 587 | 20:45 | | | 83 | 347 | 96 | 429 | 179 | 776 |
| 09:00 | | | 100 | | 94 | | 194 | | 21:00 | | | 94 | | 112 | | 206 | |
| 09:15 | | | 112 | | 92 | | 204 | | 21:15 | | | 62 | | 86 | | 148 | |
| 09:30 | | | 102 | | 102 | | 204 | | 21:30 | | | 62 | | 79 | | 141 | |
| 09:45 | | | 133 | 447 | 144 | 432 | 277 | 879 | 21:45 | | | 54 | 272 | 76 | 353 | 130 | 625 |
| 10:00 | | | 145 | | 129 | | 274 | | 22:00 | | | 51 | | 58 | | 109 | |
| 10:15 | | | 138 | | 127 | | 265 | | 22:15 | | | 45 | | 59 | | 104 | |
| 10:30 | | | 114 | | 154 | | 268 | | 22:30 | | | 40 | | 46 | | 86 | |
| 10:45 | | | 141 | 538 | 166 | 576 | 307 | 1114 | 22:45 | | | 37 | 173 | 36 | 199 | 73 | 372 |
| 11:00 | | | 142 | | 157 | | 299 | | 23:00 | | | 30 | | 36 | | 66 | |
| 11:15 | | | 169 | | 159 | | 328 | | 23:15 | | | 31 | | 32 | | 63 | |
| 11:30 | | | 164 | | 170 | | 334 | | 23:30 | | | 33 | | 35 | | 68 | |
| 11:45 | | | 183 | 658 | 215 | 701 | 398 | 1359 | 23:45 | | | 27 | 121 | 36 | 139 | 63 | 260 |
| TOTALS | | | | 2424 | | 2389 | | 4813 | TOTALS | | | | 5644 | | 6895 | | 12539 |
| SPLIT % | | | | 50.4% | | 49.6% | | 27.7% | SPLIT % | | | | 45.0% | | 55.0% | | 72.3% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 8,068 | 9,284 | 17,352 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 11:45 | 11:45 | 11:45 | PM Peak Hour | | | 12:00 | 12:00 | 12:00 |
| AM Pk Volume | | | 722 | 863 | 1585 | PM Pk Volume | | | 724 | 843 | 1567 |
| Pk Hr Factor | | | 0.930 | 0.976 | 0.986 | Pk Hr Factor | | | 0.933 | 0.954 | 0.975 |
| 7 - 9 Volume | 0 | 0 | 485 | 415 | 900 | 4 - 6 Volume | 0 | 0 | 1117 | 1399 | 2516 |
| 7 - 9 Peak Hour | | | 08:00 | 08:00 | 08:00 | 4 - 6 Peak Hour | | | 16:00 | 16:00 | 16:00 |
| 7 - 9 Pk Volume | 0 | 0 | 319 | 268 | 587 | 4 - 6 Pk Volume | 0 | 0 | 598 | 730 | 1328 |
| Pk Hr Factor | 0.000 | 0.000 | 0.732 | 0.713 | 0.723 | Pk Hr Factor | 0.000 | 0.000 | 0.906 | 0.941 | 0.941 |

Prepared by NDS/ATD

# VOLUME

Birch St E/O State College Blvd

**Day:** Tuesday
**Date:** 11/13/2018

**City:** Brea
**Project #:** CA18_1232_007

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 12,499 | 11,971 | 24,470 |

| AM Period | NB | SB | EB | WB | TOTAL | PM Period | NB | SB | EB | WB | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 14 | 7 | 21 | 12:00 | | | 220 | 192 | 412 |
| 00:15 | | | 6 | 10 | 16 | 12:15 | | | 205 | 191 | 396 |
| 00:30 | | | 8 | 2 | 10 | 12:30 | | | 199 | 182 | 381 |
| 00:45 | | | 4 | 32 6 | 25 10 | 57 12:45 | | | 230 | 854 215 | 780 445 1634 |
| 01:00 | | | 4 | 2 | 6 | 13:00 | | | 193 | 179 | 372 |
| 01:15 | | | 10 | 2 | 12 | 13:15 | | | 199 | 164 | 363 |
| 01:30 | | | 2 | 2 | 4 | 13:30 | | | 219 | 166 | 385 |
| 01:45 | | | 5 | 21 1 | 7 6 | 28 13:45 | | | 242 | 853 177 | 686 419 1539 |
| 02:00 | | | 1 | 3 | 4 | 14:00 | | | 255 | 159 | 414 |
| 02:15 | | | 1 | 4 | 5 | 14:15 | | | 231 | 190 | 421 |
| 02:30 | | | 1 | 0 | 1 | 14:30 | | | 246 | 214 | 460 |
| 02:45 | | | 2 | 5 1 | 8 3 | 13 14:45 | | | 246 | 978 268 | 831 514 1809 |
| 03:00 | | | 1 | 2 | 3 | 15:00 | | | 303 | 247 | 550 |
| 03:15 | | | 1 | 7 | 8 | 15:15 | | | 314 | 230 | 544 |
| 03:30 | | | 2 | 8 | 10 | 15:30 | | | 252 | 243 | 495 |
| 03:45 | | | 4 | 8 13 | 30 17 | 38 15:45 | | | 228 | 1097 282 | 1002 510 2099 |
| 04:00 | | | 3 | 8 | 11 | 16:00 | | | 225 | 271 | 496 |
| 04:15 | | | 8 | 18 | 26 | 16:15 | | | 272 | 277 | 549 |
| 04:30 | | | 18 | 11 | 29 | 16:30 | | | 250 | 358 | 608 |
| 04:45 | | | 22 | 51 24 | 61 46 | 112 16:45 | | | 275 | 1022 400 | 1306 675 2328 |
| 05:00 | | | 11 | 18 | 29 | 17:00 | | | 266 | 384 | 650 |
| 05:15 | | | 25 | 24 | 49 | 17:15 | | | 295 | 388 | 683 |
| 05:30 | | | 29 | 34 | 63 | 17:30 | | | 272 | 360 | 632 |
| 05:45 | | | 77 | 142 58 | 134 135 | 276 17:45 | | | 244 | 1077 300 | 1432 544 2509 |
| 06:00 | | | 62 | 29 | 91 | 18:00 | | | 244 | 263 | 507 |
| 06:15 | | | 101 | 70 | 171 | 18:15 | | | 245 | 217 | 462 |
| 06:30 | | | 171 | 92 | 263 | 18:30 | | | 194 | 213 | 407 |
| 06:45 | | | 226 | 560 94 | 285 320 | 845 18:45 | | | 216 | 899 174 | 867 390 1766 |
| 07:00 | | | 211 | 128 | 339 | 19:00 | | | 163 | 133 | 296 |
| 07:15 | | | 228 | 145 | 373 | 19:15 | | | 151 | 135 | 286 |
| 07:30 | | | 308 | 190 | 498 | 19:30 | | | 136 | 98 | 234 |
| 07:45 | | | 318 | 1065 278 | 741 596 | 1806 19:45 | | | 115 | 565 103 | 469 218 1034 |
| 08:00 | | | 285 | 246 | 531 | 20:00 | | | 116 | 76 | 192 |
| 08:15 | | | 187 | 220 | 407 | 20:15 | | | 114 | 83 | 197 |
| 08:30 | | | 143 | 185 | 328 | 20:30 | | | 125 | 74 | 199 |
| 08:45 | | | 159 | 774 194 | 845 353 | 1619 20:45 | | | 115 | 470 76 | 309 191 779 |
| 09:00 | | | 146 | 156 | 302 | 21:00 | | | 73 | 51 | 124 |
| 09:15 | | | 103 | 138 | 241 | 21:15 | | | 68 | 25 | 93 |
| 09:30 | | | 112 | 131 | 243 | 21:30 | | | 58 | 26 | 84 |
| 09:45 | | | 110 | 471 178 | 603 288 | 1074 21:45 | | | 47 | 246 28 | 130 75 376 |
| 10:00 | | | 110 | 158 | 268 | 22:00 | | | 52 | 33 | 85 |
| 10:15 | | | 119 | 121 | 240 | 22:15 | | | 34 | 25 | 59 |
| 10:30 | | | 140 | 156 | 296 | 22:30 | | | 36 | 19 | 55 |
| 10:45 | | | 134 | 503 138 | 573 272 | 1076 22:45 | | | 17 | 139 12 | 89 29 228 |
| 11:00 | | | 150 | 152 | 302 | 23:00 | | | 25 | 15 | 40 |
| 11:15 | | | 144 | 167 | 311 | 23:15 | | | 18 | 10 | 28 |
| 11:30 | | | 158 | 200 | 358 | 23:30 | | | 8 | 7 | 15 |
| 11:45 | | | 154 | 606 199 | 718 353 | 1324 23:45 | | | 10 | 61 8 | 40 18 101 |
| TOTALS | | | | 4238 | 4030 | 8268 | TOTALS | | | 8261 | 7941 | 16202 |
| SPLIT % | | | | 51.3% | 48.7% | 33.8% | SPLIT % | | | 51.0% | 49.0% | 66.2% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 12,499 | 11,971 | 24,470 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 07:15 | 07:30 | 07:30 | PM Peak Hour | | | 14:45 | 16:45 | 16:45 |
| AM Pk Volume | | | 1139 | 934 | 2032 | PM Pk Volume | | | 1115 | 1532 | 2640 |
| Pk Hr Factor | | | 0.895 | 0.840 | 0.852 | Pk Hr Factor | | | 0.888 | 0.958 | 0.966 |
| 7 - 9 Volume | 0 | 0 | 1839 | 1586 | 3425 | 4 - 6 Volume | 0 | 0 | 2099 | 2738 | 4837 |
| 7 - 9 Peak Hour | | | 07:15 | 07:30 | 07:30 | 4 - 6 Peak Hour | | | 16:45 | 16:45 | 16:45 |
| 7 - 9 Pk Volume | 0 | 0 | 1139 | 934 | 2032 | 4 - 6 Pk Volume | 0 | 0 | 1108 | 1532 | 2640 |
| Pk Hr Factor | 0.000 | 0.000 | 0.895 | 0.840 | 0.852 | Pk Hr Factor | 0.000 | 0.000 | 0.939 | 0.958 | 0.966 |

Prepared by NDS/ATD

# VOLUME

Birch St E/O S Associated Rd

**Day:** Tuesday
**Date:** 11/13/2018

**City:** Brea
**Project #:** CA18_1232_008

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 12,383 | 11,595 | 23,978 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 13 | | 6 | | 19 | | 12:00 | | | 201 | | 199 | | 400 | |
| 00:15 | | | 10 | | 10 | | 20 | | 12:15 | | | 187 | | 185 | | 372 | |
| 00:30 | | | 6 | | 1 | | 7 | | 12:30 | | | 175 | | 147 | | 322 | |
| 00:45 | | | 3 | 32 | 3 | 20 | 6 | 52 | 12:45 | | | 215 | 778 | 177 | 708 | 392 | 1486 |
| 01:00 | | | 6 | | 4 | | 10 | | 13:00 | | | 163 | | 161 | | 324 | |
| 01:15 | | | 4 | | 3 | | 7 | | 13:15 | | | 215 | | 145 | | 360 | |
| 01:30 | | | 2 | | 4 | | 6 | | 13:30 | | | 205 | | 180 | | 385 | |
| 01:45 | | | 5 | 17 | 2 | 13 | 7 | 30 | 13:45 | | | 242 | 825 | 160 | 646 | 402 | 1471 |
| 02:00 | | | 0 | | 2 | | 2 | | 14:00 | | | 248 | | 153 | | 401 | |
| 02:15 | | | 3 | | 2 | | 5 | | 14:15 | | | 239 | | 166 | | 405 | |
| 02:30 | | | 2 | | 1 | | 3 | | 14:30 | | | 278 | | 206 | | 484 | |
| 02:45 | | | 6 | 11 | 1 | 6 | 7 | 17 | 14:45 | | | 256 | 1021 | 307 | 832 | 563 | 1853 |
| 03:00 | | | 6 | | 4 | | 10 | | 15:00 | | | 310 | | 233 | | 543 | |
| 03:15 | | | 1 | | 9 | | 10 | | 15:15 | | | 280 | | 185 | | 465 | |
| 03:30 | | | 4 | | 15 | | 19 | | 15:30 | | | 242 | | 266 | | 508 | |
| 03:45 | | | 5 | 16 | 10 | 38 | 15 | 54 | 15:45 | | | 237 | 1069 | 248 | 932 | 485 | 2001 |
| 04:00 | | | 2 | | 7 | | 9 | | 16:00 | | | 218 | | 268 | | 486 | |
| 04:15 | | | 16 | | 13 | | 29 | | 16:15 | | | 254 | | 264 | | 518 | |
| 04:30 | | | 32 | | 18 | | 50 | | 16:30 | | | 265 | | 320 | | 585 | |
| 04:45 | | | 31 | 81 | 24 | 62 | 55 | 143 | 16:45 | | | 265 | 1002 | 324 | 1176 | 589 | 2178 |
| 05:00 | | | 18 | | 20 | | 38 | | 17:00 | | | 269 | | 365 | | 634 | |
| 05:15 | | | 29 | | 26 | | 55 | | 17:15 | | | 294 | | 368 | | 662 | |
| 05:30 | | | 31 | | 47 | | 78 | | 17:30 | | | 284 | | 344 | | 628 | |
| 05:45 | | | 92 | 170 | 64 | 157 | 156 | 327 | 17:45 | | | 263 | 1110 | 278 | 1355 | 541 | 2465 |
| 06:00 | | | 75 | | 49 | | 124 | | 18:00 | | | 235 | | 224 | | 459 | |
| 06:15 | | | 97 | | 97 | | 194 | | 18:15 | | | 242 | | 193 | | 435 | |
| 06:30 | | | 214 | | 108 | | 322 | | 18:30 | | | 186 | | 193 | | 379 | |
| 06:45 | | | 256 | 642 | 147 | 401 | 403 | 1043 | 18:45 | | | 208 | 871 | 141 | 751 | 349 | 1622 |
| 07:00 | | | 202 | | 164 | | 366 | | 19:00 | | | 173 | | 112 | | 285 | |
| 07:15 | | | 215 | | 165 | | 380 | | 19:15 | | | 137 | | 123 | | 260 | |
| 07:30 | | | 282 | | 223 | | 505 | | 19:30 | | | 123 | | 96 | | 219 | |
| 07:45 | | | 335 | 1034 | 296 | 848 | 631 | 1882 | 19:45 | | | 96 | 529 | 87 | 418 | 183 | 947 |
| 08:00 | | | 292 | | 271 | | 563 | | 20:00 | | | 114 | | 81 | | 195 | |
| 08:15 | | | 275 | | 246 | | 521 | | 20:15 | | | 109 | | 77 | | 186 | |
| 08:30 | | | 148 | | 188 | | 336 | | 20:30 | | | 112 | | 57 | | 169 | |
| 08:45 | | | 147 | 862 | 182 | 887 | 329 | 1749 | 20:45 | | | 93 | 428 | 65 | 280 | 158 | 708 |
| 09:00 | | | 133 | | 157 | | 290 | | 21:00 | | | 75 | | 50 | | 125 | |
| 09:15 | | | 101 | | 126 | | 227 | | 21:15 | | | 68 | | 22 | | 90 | |
| 09:30 | | | 107 | | 134 | | 241 | | 21:30 | | | 48 | | 31 | | 79 | |
| 09:45 | | | 110 | 451 | 158 | 575 | 268 | 1026 | 21:45 | | | 54 | 245 | 27 | 130 | 81 | 375 |
| 10:00 | | | 97 | | 145 | | 242 | | 22:00 | | | 45 | | 23 | | 68 | |
| 10:15 | | | 111 | | 122 | | 233 | | 22:15 | | | 38 | | 32 | | 70 | |
| 10:30 | | | 124 | | 148 | | 272 | | 22:30 | | | 35 | | 22 | | 57 | |
| 10:45 | | | 126 | 458 | 142 | 557 | 268 | 1015 | 22:45 | | | 17 | 135 | 15 | 92 | 32 | 227 |
| 11:00 | | | 133 | | 135 | | 268 | | 23:00 | | | 27 | | 15 | | 42 | |
| 11:15 | | | 125 | | 159 | | 284 | | 23:15 | | | 14 | | 14 | | 28 | |
| 11:30 | | | 123 | | 189 | | 312 | | 23:30 | | | 13 | | 15 | | 28 | |
| 11:45 | | | 154 | 535 | 175 | 658 | 329 | 1193 | 23:45 | | | 7 | 61 | 9 | 53 | 16 | 114 |
| TOTALS | | | | 4309 | | 4222 | | 8531 | TOTALS | | | | 8074 | | 7373 | | 15447 |
| SPLIT % | | | | 50.5% | | 49.5% | | 35.6% | SPLIT % | | | | 52.3% | | 47.7% | | 64.4% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 12,383 | 11,595 | 23,978 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 07:30 | 07:30 | 07:30 | PM Peak Hour | | | 14:30 | 16:45 | 16:45 |
| AM Pk Volume | | | 1184 | 1036 | 2220 | PM Pk Volume | | | 1124 | 1401 | 2513 |
| Pk Hr Factor | | | 0.884 | 0.875 | 0.880 | Pk Hr Factor | | | 0.906 | 0.952 | 0.949 |
| 7 - 9 Volume | 0 | 0 | 1896 | 1735 | 3631 | 4 - 6 Volume | 0 | 0 | 2112 | 2531 | 4643 |
| 7 - 9 Peak Hour | | | 07:30 | 07:30 | 07:30 | 4 - 6 Peak Hour | | | 16:45 | 16:45 | 16:45 |
| 7 - 9 Pk Volume | 0 | 0 | 1184 | 1036 | 2220 | 4 - 6 Pk Volume | 0 | 0 | 1112 | 1401 | 2513 |
| Pk Hr Factor | 0.000 | 0.000 | 0.884 | 0.875 | 0.880 | Pk Hr Factor | 0.000 | 0.000 | 0.946 | 0.952 | 0.949 |

Prepared by NDS/ATD

# VOLUME

Randolph Ave S/O Birch St

**Day:** Thursday
**Date:** 5/16/2019

**City:** Brea
**Project #:** CA19_1100_002

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 3,686 | 3,446 | 0 | 0 | 7,132 |

| AM Period | NB | | SB | | EB | WB | TOTAL | | PM Period | NB | | SB | | EB | WB | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | 11 | | 2 | | | | 13 | | 12:00 | 60 | | 76 | | | | 136 | |
| 00:15 | 2 | | 1 | | | | 3 | | 12:15 | 65 | | 46 | | | | 111 | |
| 00:30 | 3 | | 4 | | | | 7 | | 12:30 | 79 | | 72 | | | | 151 | |
| 00:45 | 2 | 18 | 3 | 10 | | | 5 | 28 | 12:45 | 66 | 270 | 70 | 264 | | | 136 | 534 |
| 01:00 | 4 | | 3 | | | | 7 | | 13:00 | 92 | | 54 | | | | 146 | |
| 01:15 | 1 | | 1 | | | | 2 | | 13:15 | 77 | | 76 | | | | 153 | |
| 01:30 | 0 | | 1 | | | | 1 | | 13:30 | 71 | | 58 | | | | 129 | |
| 01:45 | 3 | 8 | 0 | 5 | | | 3 | 13 | 13:45 | 73 | 313 | 50 | 238 | | | 123 | 551 |
| 02:00 | 1 | | 1 | | | | 2 | | 14:00 | 73 | | 66 | | | | 139 | |
| 02:15 | 2 | | 3 | | | | 5 | | 14:15 | 71 | | 77 | | | | 148 | |
| 02:30 | 2 | | 1 | | | | 3 | | 14:30 | 84 | | 69 | | | | 153 | |
| 02:45 | 1 | 6 | 0 | 5 | | | 1 | 11 | 14:45 | 61 | 289 | 63 | 275 | | | 124 | 564 |
| 03:00 | 1 | | 6 | | | | 7 | | 15:00 | 59 | | 71 | | | | 130 | |
| 03:15 | 7 | | 2 | | | | 9 | | 15:15 | 76 | | 61 | | | | 137 | |
| 03:30 | 0 | | 1 | | | | 1 | | 15:30 | 71 | | 70 | | | | 141 | |
| 03:45 | 9 | 17 | 3 | 12 | | | 12 | 29 | 15:45 | 81 | 287 | 62 | 264 | | | 143 | 551 |
| 04:00 | 4 | | 4 | | | | 8 | | 16:00 | 77 | | 64 | | | | 141 | |
| 04:15 | 1 | | 3 | | | | 4 | | 16:15 | 86 | | 70 | | | | 156 | |
| 04:30 | 2 | | 4 | | | | 6 | | 16:30 | 67 | | 86 | | | | 153 | |
| 04:45 | 8 | 15 | 8 | 19 | | | 16 | 34 | 16:45 | 106 | 336 | 83 | 303 | | | 189 | 639 |
| 05:00 | 4 | | 4 | | | | 8 | | 17:00 | 80 | | 81 | | | | 161 | |
| 05:15 | 7 | | 11 | | | | 18 | | 17:15 | 76 | | 85 | | | | 161 | |
| 05:30 | 6 | | 13 | | | | 19 | | 17:30 | 84 | | 49 | | | | 133 | |
| 05:45 | 4 | 21 | 27 | 55 | | | 31 | 76 | 17:45 | 65 | 305 | 72 | 287 | | | 137 | 592 |
| 06:00 | 15 | | 25 | | | | 40 | | 18:00 | 86 | | 52 | | | | 138 | |
| 06:15 | 8 | | 23 | | | | 31 | | 18:15 | 82 | | 60 | | | | 142 | |
| 06:30 | 12 | | 24 | | | | 36 | | 18:30 | 58 | | 57 | | | | 115 | |
| 06:45 | 14 | 49 | 39 | 111 | | | 53 | 160 | 18:45 | 58 | 284 | 48 | 217 | | | 106 | 501 |
| 07:00 | 29 | | 21 | | | | 50 | | 19:00 | 59 | | 53 | | | | 112 | |
| 07:15 | 19 | | 37 | | | | 56 | | 19:15 | 52 | | 38 | | | | 90 | |
| 07:30 | 29 | | 31 | | | | 60 | | 19:30 | 60 | | 36 | | | | 96 | |
| 07:45 | 36 | 113 | 40 | 129 | | | 76 | 242 | 19:45 | 53 | 224 | 32 | 159 | | | 85 | 383 |
| 08:00 | 33 | | 45 | | | | 78 | | 20:00 | 54 | | 36 | | | | 90 | |
| 08:15 | 41 | | 40 | | | | 81 | | 20:15 | 42 | | 33 | | | | 75 | |
| 08:30 | 36 | | 51 | | | | 87 | | 20:30 | 57 | | 32 | | | | 89 | |
| 08:45 | 38 | 148 | 54 | 190 | | | 92 | 338 | 20:45 | 39 | 192 | 33 | 134 | | | 72 | 326 |
| 09:00 | 26 | | 36 | | | | 62 | | 21:00 | 41 | | 15 | | | | 56 | |
| 09:15 | 29 | | 44 | | | | 73 | | 21:15 | 45 | | 18 | | | | 63 | |
| 09:30 | 27 | | 47 | | | | 74 | | 21:30 | 25 | | 19 | | | | 44 | |
| 09:45 | 41 | 123 | 50 | 177 | | | 91 | 300 | 21:45 | 20 | 131 | 13 | 65 | | | 33 | 196 |
| 10:00 | 48 | | 54 | | | | 102 | | 22:00 | 25 | | 7 | | | | 32 | |
| 10:15 | 51 | | 56 | | | | 107 | | 22:15 | 19 | | 10 | | | | 29 | |
| 10:30 | 33 | | 53 | | | | 86 | | 22:30 | 18 | | 10 | | | | 28 | |
| 10:45 | 39 | 171 | 60 | 223 | | | 99 | 394 | 22:45 | 17 | 79 | 8 | 35 | | | 25 | 114 |
| 11:00 | 62 | | 56 | | | | 118 | | 23:00 | 17 | | 8 | | | | 25 | |
| 11:15 | 54 | | 63 | | | | 117 | | 23:15 | 7 | | 2 | | | | 9 | |
| 11:30 | 52 | | 70 | | | | 122 | | 23:30 | 6 | | 5 | | | | 11 | |
| 11:45 | 76 | 244 | 62 | 251 | | | 138 | 495 | 23:45 | 13 | 43 | 3 | 18 | | | 16 | 61 |
| TOTALS | | 933 | | 1187 | | | | 2120 | TOTALS | | 2753 | | 2259 | | | | 5012 |
| SPLIT % | | 44.0% | | 56.0% | | | | 29.7% | SPLIT % | | 54.9% | | 45.1% | | | | 70.3% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 3,686 | 3,446 | 0 | 0 | 7,132 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | 11:45 | 11:15 | | | | 11:45 | PM Peak Hour | 16:45 | 16:30 | | | | 16:30 |
| AM Pk Volume | 280 | 271 | | | | 536 | PM Pk Volume | 346 | 335 | | | | 664 |
| Pk Hr Factor | 0.886 | 0.891 | | | | 0.887 | Pk Hr Factor | 0.816 | 0.974 | | | | 0.878 |
| 7 - 9 Volume | 261 | 319 | 0 | 0 | | 580 | 4 - 6 Volume | 641 | 590 | 0 | 0 | | 1231 |
| 7 - 9 Peak Hour | 08:00 | 08:00 | | | | 08:00 | 4 - 6 Peak Hour | 16:45 | 16:30 | | | | 16:30 |
| 7 - 9 Pk Volume | 148 | 190 | 0 | 0 | | 338 | 4 - 6 Pk Volume | 346 | 335 | 0 | 0 | | 664 |
| Pk Hr Factor | 0.902 | 0.880 | 0.000 | 0.000 | | 0.918 | Pk Hr Factor | 0.816 | 0.974 | 0.000 | 0.000 | | 0.878 |

Prepared by NDS/ATD

# VOLUME

Randolph Ave S/O Birch St

**Day:** Saturday
**Date:** 5/18/2019

**City:** Brea
**Project #:** CA19_1100_002

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 3,869 | 3,404 | 0 | 0 | 7,273 |

| AM Period | NB | | SB | | EB | WB | TOTAL | | PM Period | NB | | SB | | EB | WB | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | 6 | | 7 | | | | 13 | | 12:00 | 96 | | 88 | | | | 184 | |
| 00:15 | 12 | | 2 | | | | 14 | | 12:15 | 75 | | 77 | | | | 152 | |
| 00:30 | 9 | | 9 | | | | 18 | | 12:30 | 75 | | 69 | | | | 144 | |
| 00:45 | 4 | 31 | 0 | 18 | | | 4 | 49 | 12:45 | 89 | 335 | 79 | 313 | | | 168 | 648 |
| 01:00 | 2 | | 3 | | | | 5 | | 13:00 | 79 | | 97 | | | | 176 | |
| 01:15 | 10 | | 2 | | | | 12 | | 13:15 | 102 | | 59 | | | | 161 | |
| 01:30 | 6 | | 1 | | | | 7 | | 13:30 | 85 | | 72 | | | | 157 | |
| 01:45 | 6 | 24 | 2 | 8 | | | 8 | 32 | 13:45 | 90 | 356 | 87 | 315 | | | 177 | 671 |
| 02:00 | 1 | | 2 | | | | 3 | | 14:00 | 76 | | 84 | | | | 160 | |
| 02:15 | 3 | | 3 | | | | 6 | | 14:15 | 82 | | 93 | | | | 175 | |
| 02:30 | 0 | | 1 | | | | 1 | | 14:30 | 108 | | 62 | | | | 170 | |
| 02:45 | 2 | 6 | 1 | 7 | | | 3 | 13 | 14:45 | 74 | 340 | 80 | 319 | | | 154 | 659 |
| 03:00 | 2 | | 2 | | | | 4 | | 15:00 | 102 | | 77 | | | | 179 | |
| 03:15 | 1 | | 2 | | | | 3 | | 15:15 | 101 | | 65 | | | | 166 | |
| 03:30 | 2 | | 0 | | | | 2 | | 15:30 | 80 | | 65 | | | | 145 | |
| 03:45 | 8 | 13 | 2 | 6 | | | 10 | 19 | 15:45 | 89 | 372 | 59 | 266 | | | 148 | 638 |
| 04:00 | 3 | | 5 | | | | 8 | | 16:00 | 85 | | 70 | | | | 155 | |
| 04:15 | 7 | | 2 | | | | 9 | | 16:15 | 63 | | 59 | | | | 122 | |
| 04:30 | 1 | | 1 | | | | 2 | | 16:30 | 73 | | 49 | | | | 122 | |
| 04:45 | 6 | 17 | 3 | 11 | | | 9 | 28 | 16:45 | 79 | 300 | 46 | 224 | | | 125 | 524 |
| 05:00 | 1 | | 10 | | | | 11 | | 17:00 | 67 | | 63 | | | | 130 | |
| 05:15 | 10 | | 2 | | | | 12 | | 17:15 | 75 | | 55 | | | | 130 | |
| 05:30 | 4 | | 6 | | | | 10 | | 17:30 | 71 | | 43 | | | | 114 | |
| 05:45 | 6 | 21 | 6 | 24 | | | 12 | 45 | 17:45 | 55 | 268 | 41 | 202 | | | 96 | 470 |
| 06:00 | 3 | | 6 | | | | 9 | | 18:00 | 61 | | 38 | | | | 99 | |
| 06:15 | 5 | | 10 | | | | 15 | | 18:15 | 43 | | 42 | | | | 85 | |
| 06:30 | 8 | | 12 | | | | 20 | | 18:30 | 60 | | 40 | | | | 100 | |
| 06:45 | 10 | 26 | 16 | 44 | | | 26 | 70 | 18:45 | 56 | 220 | 48 | 168 | | | 104 | 388 |
| 07:00 | 9 | | 12 | | | | 21 | | 19:00 | 58 | | 28 | | | | 86 | |
| 07:15 | 14 | | 10 | | | | 24 | | 19:15 | 38 | | 31 | | | | 69 | |
| 07:30 | 19 | | 30 | | | | 49 | | 19:30 | 54 | | 35 | | | | 89 | |
| 07:45 | 21 | 63 | 28 | 80 | | | 49 | 143 | 19:45 | 42 | 192 | 32 | 126 | | | 74 | 318 |
| 08:00 | 27 | | 28 | | | | 55 | | 20:00 | 49 | | 31 | | | | 80 | |
| 08:15 | 31 | | 22 | | | | 53 | | 20:15 | 51 | | 23 | | | | 74 | |
| 08:30 | 33 | | 43 | | | | 76 | | 20:30 | 55 | | 28 | | | | 83 | |
| 08:45 | 35 | 126 | 53 | 146 | | | 88 | 272 | 20:45 | 43 | 198 | 27 | 109 | | | 70 | 307 |
| 09:00 | 40 | | 43 | | | | 83 | | 21:00 | 46 | | 24 | | | | 70 | |
| 09:15 | 55 | | 56 | | | | 111 | | 21:15 | 25 | | 16 | | | | 41 | |
| 09:30 | 42 | | 37 | | | | 79 | | 21:30 | 28 | | 12 | | | | 40 | |
| 09:45 | 62 | 199 | 90 | 226 | | | 152 | 425 | 21:45 | 26 | 125 | 19 | 71 | | | 45 | 196 |
| 10:00 | 53 | | 66 | | | | 119 | | 22:00 | 23 | | 22 | | | | 45 | |
| 10:15 | 54 | | 75 | | | | 129 | | 22:15 | 21 | | 13 | | | | 34 | |
| 10:30 | 58 | | 77 | | | | 135 | | 22:30 | 13 | | 15 | | | | 28 | |
| 10:45 | 56 | 221 | 94 | 312 | | | 150 | 533 | 22:45 | 20 | 77 | 7 | 57 | | | 27 | 134 |
| 11:00 | 65 | | 81 | | | | 146 | | 23:00 | 15 | | 10 | | | | 25 | |
| 11:15 | 80 | | 69 | | | | 149 | | 23:15 | 11 | | 11 | | | | 22 | |
| 11:30 | 78 | | 75 | | | | 153 | | 23:30 | 14 | | 6 | | | | 20 | |
| 11:45 | 61 | 284 | 95 | 320 | | | 156 | 604 | 23:45 | 15 | 55 | 5 | 32 | | | 20 | 87 |
| TOTALS | | 1031 | | 1202 | | | | 2233 | TOTALS | | 2838 | | 2202 | | | | 5040 |
| SPLIT % | | 46.2% | | 53.8% | | | | 30.7% | SPLIT % | | 56.3% | | 43.7% | | | | 69.3% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 3,869 | 3,404 | 0 | 0 | 7,273 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | 11:15 | 11:30 | | | 11:30 | PM Peak Hour | 14:30 | 13:30 | | | 13:45 |
| AM Pk Volume | 315 | 335 | | | 645 | PM Pk Volume | 385 | 336 | | | 682 |
| Pk Hr Factor | 0.820 | 0.882 | | | 0.876 | Pk Hr Factor | 0.891 | 0.903 | | | 0.963 |
| 7 - 9 Volume | 189 | 226 | 0 | 0 | 415 | 4 - 6 Volume | 568 | 426 | 0 | 0 | 994 |
| 7 - 9 Peak Hour | 08:00 | 08:00 | | | 08:00 | 4 - 6 Peak Hour | 16:00 | 16:00 | | | 16:00 |
| 7 - 9 Pk Volume | 126 | 146 | 0 | 0 | 272 | 4 - 6 Pk Volume | 300 | 224 | 0 | 0 | 524 |
| Pk Hr Factor | 0.900 | 0.689 | 0.000 | 0.000 | 0.773 | Pk Hr Factor | 0.882 | 0.800 | 0.000 | 0.000 | 0.845 |

Prepared by NDS/ATD

# VOLUME

State College Blvd S/O Birch St

**Day:** Thursday
**Date:** 5/16/2019

**City:** Brea
**Project #:** CA19_1100_003

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 6,005 | 7,452 | 0 | 0 | 13,457 |

| AM Period | NB | | SB | | EB | | WB | | TOTAL | | PM Period | NB | | SB | | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | 10 | | 7 | | | | | | 17 | | 12:00 | 80 | | 105 | | | | | | 185 | |
| 00:15 | 7 | | 5 | | | | | | 12 | | 12:15 | 79 | | 142 | | | | | | 221 | |
| 00:30 | 4 | | 7 | | | | | | 11 | | 12:30 | 106 | | 129 | | | | | | 235 | |
| 00:45 | 9 | 30 | 4 | 23 | | | | | 13 | 53 | 12:45 | 124 | 389 | 117 | 493 | | | | | 241 | 882 |
| 01:00 | 3 | | 1 | | | | | | 4 | | 13:00 | 127 | | 118 | | | | | | 245 | |
| 01:15 | 0 | | 1 | | | | | | 1 | | 13:15 | 139 | | 111 | | | | | | 250 | |
| 01:30 | 6 | | 3 | | | | | | 9 | | 13:30 | 123 | | 122 | | | | | | 245 | |
| 01:45 | 5 | 14 | 2 | 7 | | | | | 7 | 21 | 13:45 | 119 | 508 | 125 | 476 | | | | | 244 | 984 |
| 02:00 | 2 | | 1 | | | | | | 3 | | 14:00 | 121 | | 109 | | | | | | 230 | |
| 02:15 | 1 | | 4 | | | | | | 5 | | 14:15 | 104 | | 102 | | | | | | 206 | |
| 02:30 | 2 | | 5 | | | | | | 7 | | 14:30 | 104 | | 109 | | | | | | 213 | |
| 02:45 | 2 | 7 | 3 | 13 | | | | | 5 | 20 | 14:45 | 101 | 430 | 127 | 447 | | | | | 228 | 877 |
| 03:00 | 1 | | 1 | | | | | | 2 | | 15:00 | 99 | | 142 | | | | | | 241 | |
| 03:15 | 2 | | 4 | | | | | | 6 | | 15:15 | 123 | | 120 | | | | | | 243 | |
| 03:30 | 3 | | 2 | | | | | | 5 | | 15:30 | 131 | | 128 | | | | | | 259 | |
| 03:45 | 1 | 7 | 5 | 12 | | | | | 6 | 19 | 15:45 | 133 | 486 | 122 | 512 | | | | | 255 | 998 |
| 04:00 | 4 | | 1 | | | | | | 5 | | 16:00 | 107 | | 137 | | | | | | 244 | |
| 04:15 | 5 | | 6 | | | | | | 11 | | 16:15 | 132 | | 105 | | | | | | 237 | |
| 04:30 | 4 | | 9 | | | | | | 13 | | 16:30 | 123 | | 140 | | | | | | 263 | |
| 04:45 | 2 | 15 | 10 | 26 | | | | | 12 | 41 | 16:45 | 140 | 502 | 126 | 508 | | | | | 266 | 1010 |
| 05:00 | 9 | | 9 | | | | | | 18 | | 17:00 | 129 | | 127 | | | | | | 256 | |
| 05:15 | 7 | | 8 | | | | | | 15 | | 17:15 | 146 | | 130 | | | | | | 276 | |
| 05:30 | 10 | | 22 | | | | | | 32 | | 17:30 | 138 | | 126 | | | | | | 264 | |
| 05:45 | 19 | 45 | 39 | 78 | | | | | 58 | 123 | 17:45 | 133 | 546 | 143 | 526 | | | | | 276 | 1072 |
| 06:00 | 8 | | 44 | | | | | | 52 | | 18:00 | 131 | | 131 | | | | | | 262 | |
| 06:15 | 14 | | 59 | | | | | | 73 | | 18:15 | 140 | | 113 | | | | | | 253 | |
| 06:30 | 27 | | 100 | | | | | | 127 | | 18:30 | 123 | | 131 | | | | | | 254 | |
| 06:45 | 45 | 94 | 137 | 340 | | | | | 182 | 434 | 18:45 | 114 | 508 | 108 | 483 | | | | | 222 | 991 |
| 07:00 | 42 | | 109 | | | | | | 151 | | 19:00 | 132 | | 115 | | | | | | 247 | |
| 07:15 | 46 | | 119 | | | | | | 165 | | 19:15 | 100 | | 95 | | | | | | 195 | |
| 07:30 | 54 | | 148 | | | | | | 202 | | 19:30 | 94 | | 124 | | | | | | 218 | |
| 07:45 | 44 | 186 | 146 | 522 | | | | | 190 | 708 | 19:45 | 94 | 420 | 66 | 400 | | | | | 160 | 820 |
| 08:00 | 61 | | 147 | | | | | | 208 | | 20:00 | 89 | | 91 | | | | | | 180 | |
| 08:15 | 57 | | 152 | | | | | | 209 | | 20:15 | 92 | | 73 | | | | | | 165 | |
| 08:30 | 58 | | 122 | | | | | | 180 | | 20:30 | 90 | | 62 | | | | | | 152 | |
| 08:45 | 52 | 228 | 137 | 558 | | | | | 189 | 786 | 20:45 | 90 | 361 | 67 | 293 | | | | | 157 | 654 |
| 09:00 | 48 | | 124 | | | | | | 172 | | 21:00 | 113 | | 60 | | | | | | 173 | |
| 09:15 | 60 | | 103 | | | | | | 163 | | 21:15 | 72 | | 53 | | | | | | 125 | |
| 09:30 | 41 | | 116 | | | | | | 157 | | 21:30 | 58 | | 30 | | | | | | 88 | |
| 09:45 | 51 | 200 | 116 | 459 | | | | | 167 | 659 | 21:45 | 33 | 276 | 37 | 180 | | | | | 70 | 456 |
| 10:00 | 55 | | 119 | | | | | | 174 | | 22:00 | 49 | | 32 | | | | | | 81 | |
| 10:15 | 54 | | 105 | | | | | | 159 | | 22:15 | 27 | | 18 | | | | | | 45 | |
| 10:30 | 52 | | 117 | | | | | | 169 | | 22:30 | 22 | | 16 | | | | | | 38 | |
| 10:45 | 86 | 247 | 126 | 467 | | | | | 212 | 714 | 22:45 | 23 | 121 | 19 | 85 | | | | | 42 | 206 |
| 11:00 | 64 | | 124 | | | | | | 188 | | 23:00 | 21 | | 18 | | | | | | 39 | |
| 11:15 | 75 | | 122 | | | | | | 197 | | 23:15 | 22 | | 11 | | | | | | 33 | |
| 11:30 | 81 | | 124 | | | | | | 205 | | 23:30 | 17 | | 7 | | | | | | 24 | |
| 11:45 | 94 | 314 | 133 | 503 | | | | | 227 | 817 | 23:45 | 11 | 71 | 5 | 41 | | | | | 16 | 112 |
| TOTALS | | 1387 | | 3008 | | | | | | 4395 | TOTALS | | 4618 | | 4444 | | | | | | 9062 |
| SPLIT % | | 31.6% | | 68.4% | | | | | | 32.7% | SPLIT % | | 51.0% | | 49.0% | | | | | | 67.3% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 6,005 | 7,452 | 0 | 0 | 13,457 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | 11:45 | 07:30 | | | 11:45 | PM Peak Hour | 16:45 | 17:15 | | | 17:15 |
| AM Pk Volume | 359 | 593 | | | 868 | PM Pk Volume | 553 | 530 | | | 1078 |
| Pk Hr Factor | 0.847 | 0.975 | | | 0.923 | Pk Hr Factor | 0.947 | 0.927 | | | 0.976 |
| 7 - 9 Volume | 414 | 1080 | 0 | 0 | 1494 | 4 - 6 Volume | 1048 | 1034 | 0 | 0 | 2082 |
| 7 - 9 Peak Hour | 08:00 | 07:30 | | | 07:30 | 4 - 6 Peak Hour | 16:45 | 17:00 | | | 17:00 |
| 7 - 9 Pk Volume | 228 | 593 | 0 | 0 | 809 | 4 - 6 Pk Volume | 553 | 526 | 0 | 0 | 1072 |
| Pk Hr Factor | 0.934 | 0.975 | 0.000 | 0.000 | 0.968 | Pk Hr Factor | 0.947 | 0.920 | 0.000 | 0.000 | 0.971 |

Prepared by NDS/ATD

# VOLUME

State College Blvd S/O Birch St

**Day:** Saturday
**Date:** 5/18/2019

**City:** Brea
**Project #:** CA19_1100_003

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 6,548 | 7,440 | 0 | 0 | 13,988 |

| AM Period | NB | | SB | | EB | WB | TOTAL | | PM Period | NB | | SB | | EB | WB | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | 22 | | 12 | | | | 34 | | 12:00 | 106 | | 195 | | | | 301 | |
| 00:15 | 15 | | 14 | | | | 29 | | 12:15 | 139 | | 180 | | | | 319 | |
| 00:30 | 19 | | 12 | | | | 31 | | 12:30 | 144 | | 218 | | | | 362 | |
| 00:45 | 18 | 74 | 8 | 46 | | | 26 | 120 | 12:45 | 131 | 520 | 201 | 794 | | | 332 | 1314 |
| 01:00 | 16 | | 4 | | | | 20 | | 13:00 | 134 | | 146 | | | | 280 | |
| 01:15 | 9 | | 7 | | | | 16 | | 13:15 | 154 | | 165 | | | | 319 | |
| 01:30 | 6 | | 7 | | | | 13 | | 13:30 | 151 | | 177 | | | | 328 | |
| 01:45 | 5 | 36 | 1 | 19 | | | 6 | 55 | 13:45 | 137 | 576 | 186 | 674 | | | 323 | 1250 |
| 02:00 | 5 | | 6 | | | | 11 | | 14:00 | 141 | | 132 | | | | 273 | |
| 02:15 | 4 | | 1 | | | | 5 | | 14:15 | 137 | | 154 | | | | 291 | |
| 02:30 | 0 | | 4 | | | | 4 | | 14:30 | 162 | | 138 | | | | 300 | |
| 02:45 | 2 | 11 | 6 | 17 | | | 8 | 28 | 14:45 | 148 | 588 | 177 | 601 | | | 325 | 1189 |
| 03:00 | 3 | | 2 | | | | 5 | | 15:00 | 131 | | 152 | | | | 283 | |
| 03:15 | 7 | | 0 | | | | 7 | | 15:15 | 163 | | 154 | | | | 317 | |
| 03:30 | 1 | | 2 | | | | 3 | | 15:30 | 137 | | 163 | | | | 300 | |
| 03:45 | 2 | 13 | 5 | 9 | | | 7 | 22 | 15:45 | 144 | 575 | 186 | 655 | | | 330 | 1230 |
| 04:00 | 2 | | 5 | | | | 7 | | 16:00 | 154 | | 151 | | | | 305 | |
| 04:15 | 7 | | 7 | | | | 14 | | 16:15 | 146 | | 159 | | | | 305 | |
| 04:30 | 2 | | 2 | | | | 4 | | 16:30 | 134 | | 161 | | | | 295 | |
| 04:45 | 1 | 12 | 4 | 18 | | | 5 | 30 | 16:45 | 115 | 549 | 163 | 634 | | | 278 | 1183 |
| 05:00 | 6 | | 7 | | | | 13 | | 17:00 | 119 | | 170 | | | | 289 | |
| 05:15 | 2 | | 8 | | | | 10 | | 17:15 | 128 | | 137 | | | | 265 | |
| 05:30 | 1 | | 6 | | | | 7 | | 17:30 | 128 | | 145 | | | | 273 | |
| 05:45 | 5 | 14 | 11 | 32 | | | 16 | 46 | 17:45 | 136 | 511 | 123 | 575 | | | 259 | 1086 |
| 06:00 | 8 | | 9 | | | | 17 | | 18:00 | 125 | | 148 | | | | 273 | |
| 06:15 | 9 | | 15 | | | | 24 | | 18:15 | 113 | | 130 | | | | 243 | |
| 06:30 | 15 | | 15 | | | | 30 | | 18:30 | 102 | | 141 | | | | 243 | |
| 06:45 | 17 | 49 | 15 | 54 | | | 32 | 103 | 18:45 | 128 | 468 | 139 | 558 | | | 267 | 1026 |
| 07:00 | 10 | | 25 | | | | 35 | | 19:00 | 131 | | 124 | | | | 255 | |
| 07:15 | 18 | | 32 | | | | 50 | | 19:15 | 111 | | 81 | | | | 192 | |
| 07:30 | 10 | | 39 | | | | 49 | | 19:30 | 114 | | 76 | | | | 190 | |
| 07:45 | 32 | 70 | 34 | 130 | | | 66 | 200 | 19:45 | 112 | 468 | 72 | 353 | | | 184 | 821 |
| 08:00 | 18 | | 60 | | | | 78 | | 20:00 | 103 | | 88 | | | | 191 | |
| 08:15 | 26 | | 46 | | | | 72 | | 20:15 | 128 | | 61 | | | | 189 | |
| 08:30 | 19 | | 71 | | | | 90 | | 20:30 | 114 | | 57 | | | | 171 | |
| 08:45 | 36 | 99 | 54 | 231 | | | 90 | 330 | 20:45 | 107 | 452 | 47 | 253 | | | 154 | 705 |
| 09:00 | 34 | | 64 | | | | 98 | | 21:00 | 92 | | 56 | | | | 148 | |
| 09:15 | 41 | | 58 | | | | 99 | | 21:15 | 77 | | 53 | | | | 130 | |
| 09:30 | 46 | | 70 | | | | 116 | | 21:30 | 74 | | 31 | | | | 105 | |
| 09:45 | 51 | 172 | 103 | 295 | | | 154 | 467 | 21:45 | 47 | 290 | 40 | 180 | | | 87 | 470 |
| 10:00 | 61 | | 101 | | | | 162 | | 22:00 | 42 | | 44 | | | | 86 | |
| 10:15 | 67 | | 117 | | | | 184 | | 22:15 | 67 | | 37 | | | | 104 | |
| 10:30 | 64 | | 125 | | | | 189 | | 22:30 | 39 | | 29 | | | | 68 | |
| 10:45 | 79 | 271 | 135 | 478 | | | 214 | 749 | 22:45 | 36 | 184 | 25 | 135 | | | 61 | 319 |
| 11:00 | 90 | | 148 | | | | 238 | | 23:00 | 34 | | 26 | | | | 60 | |
| 11:15 | 110 | | 156 | | | | 266 | | 23:15 | 28 | | 14 | | | | 42 | |
| 11:30 | 123 | | 153 | | | | 276 | | 23:30 | 22 | | 24 | | | | 46 | |
| 11:45 | 115 | 438 | 165 | 622 | | | 280 | 1060 | 23:45 | 24 | 108 | 13 | 77 | | | 37 | 185 |
| TOTALS | | 1259 | | 1951 | | | | 3210 | TOTALS | | 5289 | | 5489 | | | | 10778 |
| SPLIT % | | 39.2% | | 60.8% | | | | 22.9% | SPLIT % | | 49.1% | | 50.9% | | | | 77.1% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 6,548 | 7,440 | 0 | 0 | 13,988 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | 11:45 | 11:45 | | | | 11:45 | PM Peak Hour | 14:30 | 12:00 | | | | 12:00 |
| AM Pk Volume | 504 | 758 | | | | 1262 | PM Pk Volume | 604 | 794 | | | | 1314 |
| Pk Hr Factor | 0.875 | 0.869 | | | | 0.872 | Pk Hr Factor | 0.926 | 0.911 | | | | 0.907 |
| 7 - 9 Volume | 169 | 361 | 0 | 0 | | 530 | 4 - 6 Volume | 1060 | 1209 | 0 | 0 | | 2269 |
| 7 - 9 Peak Hour | 08:00 | 08:00 | | | | 08:00 | 4 - 6 Peak Hour | 16:00 | 16:15 | | | | 16:00 |
| 7 - 9 Pk Volume | 99 | 231 | 0 | 0 | | 330 | 4 - 6 Pk Volume | 549 | 653 | 0 | 0 | | 1183 |
| Pk Hr Factor | 0.688 | 0.813 | 0.000 | 0.000 | | 0.917 | Pk Hr Factor | 0.891 | 0.960 | 0.000 | 0.000 | | 0.970 |

Prepared by NDS/ATD

# VOLUME

Imperial Hwy E/O Berry St

**Day:** Thursday
**Date:** 4/19/2018

**City:** Brea
**Project #:** CA18_1082_011

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 27,735 | 27,773 | 55,508 |

| AM Period | NB | | SB | | EB | | WB | | TOTAL | | PM Period | NB | | SB | | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | | | 58 | | 57 | | 115 | | 12:00 | | | | | 451 | | 375 | | 826 | |
| 00:15 | | | | | 51 | | 64 | | 115 | | 12:15 | | | | | 456 | | 400 | | 856 | |
| 00:30 | | | | | 29 | | 47 | | 76 | | 12:30 | | | | | 445 | | 427 | | 872 | |
| 00:45 | | | | | 40 | 178 | 31 | 199 | 71 | 377 | 12:45 | | | | | 431 | 1783 | 447 | 1649 | 878 | 3432 |
| 01:00 | | | | | 23 | | 29 | | 52 | | 13:00 | | | | | 386 | | 404 | | 790 | |
| 01:15 | | | | | 30 | | 33 | | 63 | | 13:15 | | | | | 409 | | 448 | | 857 | |
| 01:30 | | | | | 37 | | 19 | | 56 | | 13:30 | | | | | 419 | | 408 | | 827 | |
| 01:45 | | | | | 43 | 133 | 31 | 112 | 74 | 245 | 13:45 | | | | | 351 | 1565 | 527 | 1787 | 878 | 3352 |
| 02:00 | | | | | 40 | | 20 | | 60 | | 14:00 | | | | | 458 | | 420 | | 878 | |
| 02:15 | | | | | 31 | | 23 | | 54 | | 14:15 | | | | | 481 | | 459 | | 940 | |
| 02:30 | | | | | 42 | | 52 | | 94 | | 14:30 | | | | | 471 | | 434 | | 905 | |
| 02:45 | | | | | 36 | 149 | 42 | 137 | 78 | 286 | 14:45 | | | | | 449 | 1859 | 506 | 1819 | 955 | 3678 |
| 03:00 | | | | | 34 | | 34 | | 68 | | 15:00 | | | | | 431 | | 486 | | 917 | |
| 03:15 | | | | | 38 | | 41 | | 79 | | 15:15 | | | | | 493 | | 489 | | 982 | |
| 03:30 | | | | | 55 | | 76 | | 131 | | 15:30 | | | | | 558 | | 470 | | 1028 | |
| 03:45 | | | | | 63 | 190 | 66 | 217 | 129 | 407 | 15:45 | | | | | 435 | 1917 | 471 | 1916 | 906 | 3833 |
| 04:00 | | | | | 78 | | 65 | | 143 | | 16:00 | | | | | 538 | | 498 | | 1036 | |
| 04:15 | | | | | 90 | | 77 | | 167 | | 16:15 | | | | | 485 | | 485 | | 970 | |
| 04:30 | | | | | 139 | | 109 | | 248 | | 16:30 | | | | | 561 | | 504 | | 1065 | |
| 04:45 | | | | | 154 | 461 | 142 | 393 | 296 | 854 | 16:45 | | | | | 526 | 2110 | 514 | 2001 | 1040 | 4111 |
| 05:00 | | | | | 146 | | 115 | | 261 | | 17:00 | | | | | 533 | | 522 | | 1055 | |
| 05:15 | | | | | 161 | | 132 | | 293 | | 17:15 | | | | | 532 | | 494 | | 1026 | |
| 05:30 | | | | | 202 | | 198 | | 400 | | 17:30 | | | | | 491 | | 524 | | 1015 | |
| 05:45 | | | | | 222 | 731 | 263 | 708 | 485 | 1439 | 17:45 | | | | | 458 | 2014 | 473 | 2013 | 931 | 4027 |
| 06:00 | | | | | 250 | | 205 | | 455 | | 18:00 | | | | | 443 | | 439 | | 882 | |
| 06:15 | | | | | 295 | | 253 | | 548 | | 18:15 | | | | | 455 | | 419 | | 874 | |
| 06:30 | | | | | 381 | | 244 | | 625 | | 18:30 | | | | | 376 | | 377 | | 753 | |
| 06:45 | | | | | 351 | 1277 | 388 | 1090 | 739 | 2367 | 18:45 | | | | | 356 | 1630 | 364 | 1599 | 720 | 3229 |
| 07:00 | | | | | 407 | | 378 | | 785 | | 19:00 | | | | | 357 | | 343 | | 700 | |
| 07:15 | | | | | 472 | | 414 | | 886 | | 19:15 | | | | | 329 | | 347 | | 676 | |
| 07:30 | | | | | 568 | | 489 | | 1057 | | 19:30 | | | | | 305 | | 345 | | 650 | |
| 07:45 | | | | | 515 | 1962 | 544 | 1825 | 1059 | 3787 | 19:45 | | | | | 287 | 1278 | 300 | 1335 | 587 | 2613 |
| 08:00 | | | | | 505 | | 487 | | 992 | | 20:00 | | | | | 275 | | 342 | | 617 | |
| 08:15 | | | | | 409 | | 448 | | 857 | | 20:15 | | | | | 222 | | 265 | | 487 | |
| 08:30 | | | | | 417 | | 435 | | 852 | | 20:30 | | | | | 231 | | 262 | | 493 | |
| 08:45 | | | | | 437 | 1768 | 384 | 1754 | 821 | 3522 | 20:45 | | | | | 203 | 931 | 252 | 1121 | 455 | 2052 |
| 09:00 | | | | | 387 | | 404 | | 791 | | 21:00 | | | | | 197 | | 291 | | 488 | |
| 09:15 | | | | | 335 | | 355 | | 690 | | 21:15 | | | | | 181 | | 297 | | 478 | |
| 09:30 | | | | | 359 | | 335 | | 694 | | 21:30 | | | | | 149 | | 213 | | 362 | |
| 09:45 | | | | | 313 | 1394 | 370 | 1464 | 683 | 2858 | 21:45 | | | | | 135 | 662 | 177 | 978 | 312 | 1640 |
| 10:00 | | | | | 346 | | 312 | | 658 | | 22:00 | | | | | 134 | | 188 | | 322 | |
| 10:15 | | | | | 362 | | 357 | | 719 | | 22:15 | | | | | 101 | | 135 | | 236 | |
| 10:30 | | | | | 367 | | 290 | | 657 | | 22:30 | | | | | 91 | | 142 | | 233 | |
| 10:45 | | | | | 416 | 1491 | 345 | 1304 | 761 | 2795 | 22:45 | | | | | 75 | 401 | 108 | 573 | 183 | 974 |
| 11:00 | | | | | 355 | | 342 | | 697 | | 23:00 | | | | | 89 | | 77 | | 166 | |
| 11:15 | | | | | 399 | | 378 | | 777 | | 23:15 | | | | | 67 | | 83 | | 150 | |
| 11:30 | | | | | 441 | | 362 | | 803 | | 23:30 | | | | | 57 | | 73 | | 130 | |
| 11:45 | | | | | 396 | 1591 | 393 | 1475 | 789 | 3066 | 23:45 | | | | | 47 | 260 | 71 | 304 | 118 | 564 |
| TOTALS | | | | | | 11325 | | 10678 | | 22003 | TOTALS | | | | | | 16410 | | 17095 | | 33505 |
| SPLIT % | | | | | | 51.5% | | 48.5% | | 39.6% | SPLIT % | | | | | | 49.0% | | 51.0% | | 60.4% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 27,735 | 27,773 | 55,508 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 07:15 | 07:30 | 07:15 | PM Peak Hour | | | 16:30 | 16:45 | 16:30 |
| AM Pk Volume | | | 2060 | 1968 | 3994 | PM Pk Volume | | | 2152 | 2054 | 4186 |
| Pk Hr Factor | | | 0.907 | 0.904 | 0.943 | Pk Hr Factor | | | 0.959 | 0.980 | 0.983 |
| 7 - 9 Volume | 0 | 0 | 3730 | 3579 | 7309 | 4 - 6 Volume | 0 | 0 | 4124 | 4014 | 8138 |
| 7 - 9 Peak Hour | | | 07:15 | 07:30 | 07:15 | 4 - 6 Peak Hour | | | 16:30 | 16:45 | 16:30 |
| 7 - 9 Pk Volume | 0 | 0 | 2060 | 1968 | 3994 | 4 - 6 Pk Volume | 0 | 0 | 2152 | 2054 | 4186 |
| Pk Hr Factor | 0.000 | 0.000 | 0.907 | 0.904 | 0.943 | Pk Hr Factor | 0.000 | 0.000 | 0.959 | 0.980 | 0.983 |

Prepared by NDS/ATD

# VOLUME

Imperial Hwy E/O S Brea Blvd

**Day:** Thursday
**Date:** 4/19/2018

**City:** Brea
**Project #:** CA18_1082_012

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 26,531 | 26,094 | 52,625 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 79 | | 54 | | 133 | | 12:00 | | | 423 | | 342 | | 765 | |
| 00:15 | | | 64 | | 57 | | 121 | | 12:15 | | | 429 | | 383 | | 812 | |
| 00:30 | | | 42 | | 51 | | 93 | | 12:30 | | | 387 | | 401 | | 788 | |
| 00:45 | | | 37 | 222 | 36 | 198 | 73 | 420 | 12:45 | | | 468 | 1707 | 390 | 1516 | 858 | 3223 |
| 01:00 | | | 34 | | 33 | | 67 | | 13:00 | | | 364 | | 386 | | 750 | |
| 01:15 | | | 36 | | 29 | | 65 | | 13:15 | | | 422 | | 408 | | 830 | |
| 01:30 | | | 41 | | 24 | | 65 | | 13:30 | | | 414 | | 366 | | 780 | |
| 01:45 | | | 35 | 146 | 30 | 116 | 65 | 262 | 13:45 | | | 374 | 1574 | 476 | 1636 | 850 | 3210 |
| 02:00 | | | 52 | | 18 | | 70 | | 14:00 | | | 397 | | 420 | | 817 | |
| 02:15 | | | 30 | | 34 | | 64 | | 14:15 | | | 415 | | 418 | | 833 | |
| 02:30 | | | 47 | | 49 | | 96 | | 14:30 | | | 425 | | 411 | | 836 | |
| 02:45 | | | 29 | 158 | 37 | 138 | 66 | 296 | 14:45 | | | 441 | 1678 | 441 | 1690 | 882 | 3368 |
| 03:00 | | | 34 | | 32 | | 66 | | 15:00 | | | 420 | | 422 | | 842 | |
| 03:15 | | | 33 | | 45 | | 78 | | 15:15 | | | 398 | | 452 | | 850 | |
| 03:30 | | | 51 | | 78 | | 129 | | 15:30 | | | 493 | | 411 | | 904 | |
| 03:45 | | | 58 | 176 | 67 | 222 | 125 | 398 | 15:45 | | | 395 | 1706 | 445 | 1730 | 840 | 3436 |
| 04:00 | | | 68 | | 69 | | 137 | | 16:00 | | | 458 | | 462 | | 920 | |
| 04:15 | | | 93 | | 82 | | 175 | | 16:15 | | | 431 | | 476 | | 907 | |
| 04:30 | | | 126 | | 113 | | 239 | | 16:30 | | | 467 | | 497 | | 964 | |
| 04:45 | | | 133 | 420 | 137 | 401 | 270 | 821 | 16:45 | | | 501 | 1857 | 458 | 1893 | 959 | 3750 |
| 05:00 | | | 155 | | 108 | | 263 | | 17:00 | | | 495 | | 463 | | 958 | |
| 05:15 | | | 179 | | 128 | | 307 | | 17:15 | | | 481 | | 509 | | 990 | |
| 05:30 | | | 207 | | 188 | | 395 | | 17:30 | | | 469 | | 449 | | 918 | |
| 05:45 | | | 223 | 764 | 239 | 663 | 462 | 1427 | 17:45 | | | 415 | 1860 | 451 | 1872 | 866 | 3732 |
| 06:00 | | | 237 | | 192 | | 429 | | 18:00 | | | 392 | | 395 | | 787 | |
| 06:15 | | | 296 | | 229 | | 525 | | 18:15 | | | 389 | | 421 | | 810 | |
| 06:30 | | | 333 | | 262 | | 595 | | 18:30 | | | 359 | | 393 | | 752 | |
| 06:45 | | | 349 | 1215 | 341 | 1024 | 690 | 2239 | 18:45 | | | 345 | 1485 | 393 | 1602 | 738 | 3087 |
| 07:00 | | | 373 | | 296 | | 669 | | 19:00 | | | 348 | | 337 | | 685 | |
| 07:15 | | | 424 | | 363 | | 787 | | 19:15 | | | 307 | | 361 | | 668 | |
| 07:30 | | | 458 | | 418 | | 876 | | 19:30 | | | 330 | | 309 | | 639 | |
| 07:45 | | | 394 | 1649 | 434 | 1511 | 828 | 3160 | 19:45 | | | 289 | 1274 | 339 | 1346 | 628 | 2620 |
| 08:00 | | | 445 | | 368 | | 813 | | 20:00 | | | 312 | | 310 | | 622 | |
| 08:15 | | | 350 | | 379 | | 729 | | 20:15 | | | 268 | | 276 | | 544 | |
| 08:30 | | | 361 | | 378 | | 739 | | 20:30 | | | 259 | | 259 | | 518 | |
| 08:45 | | | 407 | 1563 | 335 | 1460 | 742 | 3023 | 20:45 | | | 236 | 1075 | 273 | 1118 | 509 | 2193 |
| 09:00 | | | 357 | | 352 | | 709 | | 21:00 | | | 262 | | 265 | | 527 | |
| 09:15 | | | 357 | | 367 | | 724 | | 21:15 | | | 232 | | 287 | | 519 | |
| 09:30 | | | 351 | | 310 | | 661 | | 21:30 | | | 187 | | 212 | | 399 | |
| 09:45 | | | 306 | 1371 | 357 | 1386 | 663 | 2757 | 21:45 | | | 182 | 863 | 213 | 977 | 395 | 1840 |
| 10:00 | | | 313 | | 302 | | 615 | | 22:00 | | | 164 | | 151 | | 315 | |
| 10:15 | | | 374 | | 342 | | 716 | | 22:15 | | | 117 | | 150 | | 267 | |
| 10:30 | | | 341 | | 329 | | 670 | | 22:30 | | | 125 | | 133 | | 258 | |
| 10:45 | | | 427 | 1455 | 348 | 1321 | 775 | 2776 | 22:45 | | | 82 | 488 | 105 | 539 | 187 | 1027 |
| 11:00 | | | 328 | | 310 | | 638 | | 23:00 | | | 109 | | 88 | | 197 | |
| 11:15 | | | 380 | | 371 | | 751 | | 23:15 | | | 81 | | 88 | | 169 | |
| 11:30 | | | 396 | | 367 | | 763 | | 23:30 | | | 62 | | 72 | | 134 | |
| 11:45 | | | 403 | 1507 | 370 | 1418 | 773 | 2925 | 23:45 | | | 66 | 318 | 69 | 317 | 135 | 635 |
| TOTALS | | | | 10646 | | 9858 | | 20504 | TOTALS | | | | 15885 | | 16236 | | 32121 |
| SPLIT % | | | | 51.9% | | 48.1% | | 39.0% | SPLIT % | | | | 49.5% | | 50.5% | | 61.0% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 26,531 | 26,094 | 52,625 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 07:15 | 07:30 | 07:15 | PM Peak Hour | | | 16:45 | 16:30 | 16:30 |
| AM Pk Volume | | | 1721 | 1599 | 3304 | PM Pk Volume | | | 1946 | 1927 | 3871 |
| Pk Hr Factor | | | 0.939 | 0.921 | 0.943 | Pk Hr Factor | | | 0.971 | 0.946 | 0.978 |
| 7 - 9 Volume | 0 | 0 | 3212 | 2971 | 6183 | 4 - 6 Volume | 0 | 0 | 3717 | 3765 | 7482 |
| 7 - 9 Peak Hour | | | 07:15 | 07:30 | 07:15 | 4 - 6 Peak Hour | | | 16:45 | 16:30 | 16:30 |
| 7 - 9 Pk Volume | 0 | 0 | 1721 | 1599 | 3304 | 4 - 6 Pk Volume | 0 | 0 | 1946 | 1927 | 3871 |
| Pk Hr Factor | 0.000 | 0.000 | 0.939 | 0.921 | 0.943 | Pk Hr Factor | 0.000 | 0.000 | 0.971 | 0.946 | 0.978 |

Prepared by NDS/ATD

# VOLUME

Imperial Hwy E/O State College Blvd

**Day:** Thursday
**Date:** 4/19/2018

**City:** Brea
**Project #:** CA18_1082_013

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 33,879 | 37,392 | 71,271 |

| AM Period | NB | | SB | | EB | | WB | | TOTAL | | PM Period | NB | | SB | | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | | | 51 | | 60 | | 111 | | 12:00 | | | | | 498 | | 559 | | 1057 | |
| 00:15 | | | | | 51 | | 59 | | 110 | | 12:15 | | | | | 497 | | 622 | | 1119 | |
| 00:30 | | | | | 47 | | 41 | | 88 | | 12:30 | | | | | 551 | | 639 | | 1190 | |
| 00:45 | | | | | 44 | 193 | 38 | 198 | 82 | 391 | 12:45 | | | | | 519 | 2065 | 618 | 2438 | 1137 | 4503 |
| 01:00 | | | | | 37 | | 34 | | 71 | | 13:00 | | | | | 550 | | 572 | | 1122 | |
| 01:15 | | | | | 30 | | 33 | | 63 | | 13:15 | | | | | 480 | | 606 | | 1086 | |
| 01:30 | | | | | 27 | | 45 | | 72 | | 13:30 | | | | | 510 | | 610 | | 1120 | |
| 01:45 | | | | | 29 | 123 | 40 | 152 | 69 | 275 | 13:45 | | | | | 536 | 2076 | 547 | 2335 | 1083 | 4411 |
| 02:00 | | | | | 24 | | 36 | | 60 | | 14:00 | | | | | 500 | | 521 | | 1021 | |
| 02:15 | | | | | 35 | | 33 | | 68 | | 14:15 | | | | | 506 | | 542 | | 1048 | |
| 02:30 | | | | | 54 | | 49 | | 103 | | 14:30 | | | | | 527 | | 605 | | 1132 | |
| 02:45 | | | | | 38 | 151 | 78 | 196 | 116 | 347 | 14:45 | | | | | 538 | 2071 | 597 | 2265 | 1135 | 4336 |
| 03:00 | | | | | 33 | | 39 | | 72 | | 15:00 | | | | | 539 | | 636 | | 1175 | |
| 03:15 | | | | | 56 | | 62 | | 118 | | 15:15 | | | | | 541 | | 550 | | 1091 | |
| 03:30 | | | | | 78 | | 84 | | 162 | | 15:30 | | | | | 547 | | 563 | | 1110 | |
| 03:45 | | | | | 61 | 228 | 97 | 282 | 158 | 510 | 15:45 | | | | | 588 | 2215 | 645 | 2394 | 1233 | 4609 |
| 04:00 | | | | | 79 | | 93 | | 172 | | 16:00 | | | | | 627 | | 649 | | 1276 | |
| 04:15 | | | | | 97 | | 148 | | 245 | | 16:15 | | | | | 641 | | 719 | | 1360 | |
| 04:30 | | | | | 138 | | 113 | | 251 | | 16:30 | | | | | 646 | | 691 | | 1337 | |
| 04:45 | | | | | 147 | 461 | 209 | 563 | 356 | 1024 | 16:45 | | | | | 632 | 2546 | 646 | 2705 | 1278 | 5251 |
| 05:00 | | | | | 139 | | 153 | | 292 | | 17:00 | | | | | 617 | | 688 | | 1305 | |
| 05:15 | | | | | 157 | | 202 | | 359 | | 17:15 | | | | | 653 | | 684 | | 1337 | |
| 05:30 | | | | | 214 | | 225 | | 439 | | 17:30 | | | | | 633 | | 683 | | 1316 | |
| 05:45 | | | | | 302 | 812 | 305 | 885 | 607 | 1697 | 17:45 | | | | | 625 | 2528 | 724 | 2779 | 1349 | 5307 |
| 06:00 | | | | | 208 | | 235 | | 443 | | 18:00 | | | | | 548 | | 715 | | 1263 | |
| 06:15 | | | | | 263 | | 276 | | 539 | | 18:15 | | | | | 586 | | 640 | | 1226 | |
| 06:30 | | | | | 317 | | 344 | | 661 | | 18:30 | | | | | 525 | | 597 | | 1122 | |
| 06:45 | | | | | 446 | 1234 | 441 | 1296 | 887 | 2530 | 18:45 | | | | | 533 | 2192 | 591 | 2543 | 1124 | 4735 |
| 07:00 | | | | | 372 | | 402 | | 774 | | 19:00 | | | | | 513 | | 563 | | 1076 | |
| 07:15 | | | | | 474 | | 528 | | 1002 | | 19:15 | | | | | 497 | | 484 | | 981 | |
| 07:30 | | | | | 530 | | 512 | | 1042 | | 19:30 | | | | | 452 | | 497 | | 949 | |
| 07:45 | | | | | 518 | 1894 | 545 | 1987 | 1063 | 3881 | 19:45 | | | | | 420 | 1882 | 490 | 2034 | 910 | 3916 |
| 08:00 | | | | | 460 | | 477 | | 937 | | 20:00 | | | | | 406 | | 432 | | 838 | |
| 08:15 | | | | | 496 | | 501 | | 997 | | 20:15 | | | | | 361 | | 433 | | 794 | |
| 08:30 | | | | | 465 | | 505 | | 970 | | 20:30 | | | | | 316 | | 419 | | 735 | |
| 08:45 | | | | | 464 | 1885 | 528 | 2011 | 992 | 3896 | 20:45 | | | | | 297 | 1380 | 352 | 1636 | 649 | 3016 |
| 09:00 | | | | | 446 | | 417 | | 863 | | 21:00 | | | | | 326 | | 348 | | 674 | |
| 09:15 | | | | | 495 | | 528 | | 1023 | | 21:15 | | | | | 272 | | 253 | | 525 | |
| 09:30 | | | | | 462 | | 488 | | 950 | | 21:30 | | | | | 239 | | 235 | | 474 | |
| 09:45 | | | | | 538 | 1941 | 571 | 2004 | 1109 | 3945 | 21:45 | | | | | 212 | 1049 | 241 | 1077 | 453 | 2126 |
| 10:00 | | | | | 449 | | 553 | | 1002 | | 22:00 | | | | | 168 | | 215 | | 383 | |
| 10:15 | | | | | 480 | | 559 | | 1039 | | 22:15 | | | | | 190 | | 182 | | 372 | |
| 10:30 | | | | | 440 | | 524 | | 964 | | 22:30 | | | | | 165 | | 173 | | 338 | |
| 10:45 | | | | | 473 | 1842 | 591 | 2227 | 1064 | 4069 | 22:45 | | | | | 123 | 646 | 132 | 702 | 255 | 1348 |
| 11:00 | | | | | 493 | | 531 | | 1024 | | 23:00 | | | | | 93 | | 98 | | 191 | |
| 11:15 | | | | | 529 | | 545 | | 1074 | | 23:15 | | | | | 71 | | 138 | | 209 | |
| 11:30 | | | | | 565 | | 607 | | 1172 | | 23:30 | | | | | 76 | | 101 | | 177 | |
| 11:45 | | | | | 556 | 2143 | 572 | 2255 | 1128 | 4398 | 23:45 | | | | | 82 | 322 | 91 | 428 | 173 | 750 |
| TOTALS | | | | | | 12907 | | 14056 | | 26963 | TOTALS | | | | | | 20972 | | 23336 | | 44308 |
| SPLIT % | | | | | | 47.9% | | 52.1% | | 37.8% | SPLIT % | | | | | | 47.3% | | 52.7% | | 62.2% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 33,879 | 37,392 | 71,271 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 11:15 | 11:45 | 11:45 | PM Peak Hour | | | 16:30 | 17:15 | 17:00 |
| AM Pk Volume | | | 2148 | 2392 | 4494 | PM Pk Volume | | | 2548 | 2806 | 5307 |
| Pk Hr Factor | | | 0.950 | 0.936 | 0.944 | Pk Hr Factor | | | 0.975 | 0.969 | 0.984 |
| 7 - 9 Volume | 0 | 0 | 3779 | 3998 | 7777 | 4 - 6 Volume | 0 | 0 | 5074 | 5484 | 10558 |
| 7 - 9 Peak Hour | | | 07:30 | 07:15 | 07:15 | 4 - 6 Peak Hour | | | 16:30 | 17:00 | 17:00 |
| 7 - 9 Pk Volume | 0 | 0 | 2004 | 2062 | 4044 | 4 - 6 Pk Volume | 0 | 0 | 2548 | 2779 | 5307 |
| Pk Hr Factor | 0.000 | 0.000 | 0.945 | 0.946 | 0.951 | Pk Hr Factor | 0.000 | 0.000 | 0.975 | 0.960 | 0.984 |

Prepared by NDS/ATD

# VOLUME

## Imperial Hwy E/O SR-57 NB Ramps

**Day:** Tuesday
**Date:** 11/13/2018

**City:** Brea
**Project #:** CA18_1233_013

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 26,754 | 26,304 | 53,058 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0:00 | | | 44 | | 32 | | 76 | | 12:00 | | | 363 | | 466 | | 829 | |
| 0:15 | | | 36 | | 32 | | 68 | | 12:15 | | | 394 | | 437 | | 831 | |
| 0:30 | | | 34 | | 23 | | 57 | | 12:30 | | | 365 | | 461 | | 826 | |
| 0:45 | | | 16 | 130 | 11 | 98 | 27 | 228 | 12:45 | | | 394 | 1516 | 454 | 1818 | 848 | 3334 |
| 1:00 | | | 22 | | 27 | | 49 | | 13:00 | | | 390 | | 438 | | 828 | |
| 1:15 | | | 17 | | 9 | | 26 | | 13:15 | | | 428 | | 431 | | 859 | |
| 1:30 | | | 19 | | 29 | | 48 | | 13:30 | | | 409 | | 449 | | 858 | |
| 1:45 | | | 19 | 77 | 18 | 83 | 37 | 160 | 13:45 | | | 429 | 1656 | 404 | 1722 | 833 | 3378 |
| 2:00 | | | 14 | | 17 | | 31 | | 14:00 | | | 412 | | 426 | | 838 | |
| 2:15 | | | 14 | | 16 | | 30 | | 14:15 | | | 378 | | 441 | | 819 | |
| 2:30 | | | 18 | | 12 | | 30 | | 14:30 | | | 393 | | 456 | | 849 | |
| 2:45 | | | 26 | 72 | 14 | 59 | 40 | 131 | 14:45 | | | 396 | 1579 | 414 | 1737 | 810 | 3316 |
| 3:00 | | | 14 | | 21 | | 35 | | 15:00 | | | 398 | | 484 | | 882 | |
| 3:15 | | | 10 | | 21 | | 31 | | 15:15 | | | 465 | | 450 | | 915 | |
| 3:30 | | | 25 | | 43 | | 68 | | 15:30 | | | 491 | | 480 | | 971 | |
| 3:45 | | | 35 | 84 | 38 | 123 | 73 | 207 | 15:45 | | | 473 | 1827 | 517 | 1931 | 990 | 3758 |
| 4:00 | | | 32 | | 47 | | 79 | | 16:00 | | | 469 | | 473 | | 942 | |
| 4:15 | | | 38 | | 50 | | 88 | | 16:15 | | | 499 | | 486 | | 985 | |
| 4:30 | | | 107 | | 89 | | 196 | | 16:30 | | | 473 | | 497 | | 970 | |
| 4:45 | | | 153 | 330 | 87 | 273 | 240 | 603 | 16:45 | | | 496 | 1937 | 483 | 1939 | 979 | 3876 |
| 5:00 | | | 88 | | 98 | | 186 | | 17:00 | | | 469 | | 451 | | 920 | |
| 5:15 | | | 133 | | 117 | | 250 | | 17:15 | | | 530 | | 525 | | 1055 | |
| 5:30 | | | 177 | | 188 | | 365 | | 17:30 | | | 514 | | 496 | | 1010 | |
| 5:45 | | | 235 | 633 | 179 | 582 | 414 | 1215 | 17:45 | | | 537 | 2050 | 476 | 1948 | 1013 | 3998 |
| 6:00 | | | 249 | | 228 | | 477 | | 18:00 | | | 464 | | 436 | | 900 | |
| 6:15 | | | 260 | | 233 | | 493 | | 18:15 | | | 477 | | 418 | | 895 | |
| 6:30 | | | 404 | | 255 | | 659 | | 18:30 | | | 418 | | 378 | | 796 | |
| 6:45 | | | 417 | 1330 | 310 | 1026 | 727 | 2356 | 18:45 | | | 389 | 1748 | 347 | 1579 | 736 | 3327 |
| 7:00 | | | 441 | | 336 | | 777 | | 19:00 | | | 380 | | 340 | | 720 | |
| 7:15 | | | 446 | | 374 | | 820 | | 19:15 | | | 358 | | 346 | | 704 | |
| 7:30 | | | 446 | | 418 | | 864 | | 19:30 | | | 292 | | 310 | | 602 | |
| 7:45 | | | 531 | 1864 | 447 | 1575 | 978 | 3439 | 19:45 | | | 268 | 1298 | 276 | 1272 | 544 | 2570 |
| 8:00 | | | 477 | | 455 | | 932 | | 20:00 | | | 253 | | 301 | | 554 | |
| 8:15 | | | 483 | | 413 | | 896 | | 20:15 | | | 254 | | 247 | | 501 | |
| 8:30 | | | 518 | | 354 | | 872 | | 20:30 | | | 242 | | 245 | | 487 | |
| 8:45 | | | 462 | 1940 | 342 | 1564 | 804 | 3504 | 20:45 | | | 205 | 954 | 247 | 1040 | 452 | 1994 |
| 9:00 | | | 413 | | 297 | | 710 | | 21:00 | | | 180 | | 230 | | 410 | |
| 9:15 | | | 359 | | 295 | | 654 | | 21:15 | | | 176 | | 222 | | 398 | |
| 9:30 | | | 369 | | 290 | | 659 | | 21:30 | | | 141 | | 164 | | 305 | |
| 9:45 | | | 374 | 1515 | 376 | 1258 | 750 | 2773 | 21:45 | | | 137 | 634 | 163 | 779 | 300 | 1413 |
| 10:00 | | | 362 | | 349 | | 711 | | 22:00 | | | 142 | | 145 | | 287 | |
| 10:15 | | | 412 | | 339 | | 751 | | 22:15 | | | 127 | | 98 | | 225 | |
| 10:30 | | | 352 | | 408 | | 760 | | 22:30 | | | 106 | | 94 | | 200 | |
| 10:45 | | | 355 | 1481 | 416 | 1512 | 771 | 2993 | 22:45 | | | 78 | 453 | 96 | 433 | 174 | 886 |
| 11:00 | | | 366 | | 389 | | 755 | | 23:00 | | | 52 | | 61 | | 113 | |
| 11:15 | | | 363 | | 441 | | 804 | | 23:15 | | | 57 | | 61 | | 118 | |
| 11:30 | | | 349 | | 453 | | 802 | | 23:30 | | | 41 | | 57 | | 98 | |
| 11:45 | | | 382 | 1460 | 455 | 1738 | 837 | 3198 | 23:45 | | | 36 | 186 | 36 | 215 | 72 | 401 |
| **TOTALS** | | | | 10916 | | 9891 | | **20807** | **TOTALS** | | | | 15838 | | 16413 | | **32251** |
| **SPLIT %** | | | | 52.5% | | 47.5% | | **39.2%** | **SPLIT %** | | | | 49.1% | | 50.9% | | **60.8%** |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 26,754 | 26,304 | 53,058 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM Peak Hour** | | | 7:45 | 11:45 | **7:45** | **PM Peak Hour** | | | 17:00 | 15:45 | **17:00** |
| **AM Pk Volume** | | | 2009 | 1819 | **3678** | **PM Pk Volume** | | | 2050 | 1973 | **3998** |
| **Pk Hr Factor** | | | 0.946 | 0.976 | **0.940** | **Pk Hr Factor** | | | 0.954 | 0.954 | **0.947** |
| **7 - 9 Volume** | 0 | 0 | 3804 | 3139 | **6943** | **4 - 6 Volume** | 0 | 0 | 3987 | 3887 | **7874** |
| **7 - 9 Peak Hour** | | | 7:45 | 7:30 | **7:45** | **4 - 6 Peak Hour** | | | 17:00 | 16:30 | **17:00** |
| **7 - 9 Pk Volume** | 0 | 0 | 2009 | 1733 | **3678** | **4 - 6 Pk Volume** | 0 | 0 | 2050 | 1956 | **3998** |
| **Pk Hr Factor** | 0.000 | 0.000 | 0.946 | 0.952 | **0.940** | **Pk Hr Factor** | 0.000 | 0.000 | 0.954 | 0.931 | **0.947** |

Prepared by NDS/ATD

# VOLUME

Imperial Hwy E/O Associated Rd

**Day:** Tuesday
**Date:** 11/13/2018

**City:** Brea
**Project #:** CA18_1233_014

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 26,549 | 24,435 | 50,984 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0:00 | | | 31 | | 23 | | 54 | | 12:00 | | | 390 | | 434 | | 824 | |
| 0:15 | | | 26 | | 22 | | 48 | | 12:15 | | | 434 | | 435 | | 869 | |
| 0:30 | | | 28 | | 19 | | 47 | | 12:30 | | | 414 | | 427 | | 841 | |
| 0:45 | | | 13 | 98 | 11 | 75 | 24 | 173 | 12:45 | | | 464 | 1702 | 436 | 1732 | 900 | 3434 |
| 1:00 | | | 18 | | 22 | | 40 | | 13:00 | | | 428 | | 413 | | 841 | |
| 1:15 | | | 13 | | 6 | | 19 | | 13:15 | | | 452 | | 417 | | 869 | |
| 1:30 | | | 17 | | 20 | | 37 | | 13:30 | | | 417 | | 445 | | 862 | |
| 1:45 | | | 16 | 64 | 12 | 60 | 28 | 124 | 13:45 | | | 468 | 1765 | 388 | 1663 | 856 | 3428 |
| 2:00 | | | 14 | | 15 | | 29 | | 14:00 | | | 431 | | 400 | | 831 | |
| 2:15 | | | 11 | | 13 | | 24 | | 14:15 | | | 395 | | 424 | | 819 | |
| 2:30 | | | 16 | | 10 | | 26 | | 14:30 | | | 408 | | 438 | | 846 | |
| 2:45 | | | 22 | 63 | 10 | 48 | 32 | 111 | 14:45 | | | 394 | 1628 | 384 | 1646 | 778 | 3274 |
| 3:00 | | | 11 | | 12 | | 23 | | 15:00 | | | 412 | | 451 | | 863 | |
| 3:15 | | | 7 | | 17 | | 24 | | 15:15 | | | 478 | | 425 | | 903 | |
| 3:30 | | | 23 | | 28 | | 51 | | 15:30 | | | 480 | | 472 | | 952 | |
| 3:45 | | | 35 | 76 | 28 | 85 | 63 | 161 | 15:45 | | | 479 | 1849 | 472 | 1820 | 951 | 3669 |
| 4:00 | | | 31 | | 38 | | 69 | | 16:00 | | | 472 | | 454 | | 926 | |
| 4:15 | | | 31 | | 39 | | 70 | | 16:15 | | | 488 | | 449 | | 937 | |
| 4:30 | | | 89 | | 68 | | 157 | | 16:30 | | | 478 | | 488 | | 966 | |
| 4:45 | | | 141 | 292 | 64 | 209 | 205 | 501 | 16:45 | | | 502 | 1940 | 454 | 1845 | 956 | 3785 |
| 5:00 | | | 87 | | 65 | | 152 | | 17:00 | | | 477 | | 420 | | 897 | |
| 5:15 | | | 128 | | 86 | | 214 | | 17:15 | | | 511 | | 500 | | 1011 | |
| 5:30 | | | 164 | | 143 | | 307 | | 17:30 | | | 506 | | 496 | | 1002 | |
| 5:45 | | | 217 | 596 | 148 | 442 | 365 | 1038 | 17:45 | | | 517 | 2011 | 456 | 1872 | 973 | 3883 |
| 6:00 | | | 238 | | 187 | | 425 | | 18:00 | | | 462 | | 425 | | 887 | |
| 6:15 | | | 245 | | 183 | | 428 | | 18:15 | | | 468 | | 422 | | 890 | |
| 6:30 | | | 372 | | 235 | | 607 | | 18:30 | | | 410 | | 366 | | 776 | |
| 6:45 | | | 402 | 1257 | 271 | 876 | 673 | 2133 | 18:45 | | | 352 | 1692 | 333 | 1546 | 685 | 3238 |
| 7:00 | | | 422 | | 303 | | 725 | | 19:00 | | | 357 | | 325 | | 682 | |
| 7:15 | | | 420 | | 330 | | 750 | | 19:15 | | | 342 | | 332 | | 674 | |
| 7:30 | | | 423 | | 384 | | 807 | | 19:30 | | | 285 | | 291 | | 576 | |
| 7:45 | | | 514 | 1779 | 422 | 1439 | 936 | 3218 | 19:45 | | | 267 | 1251 | 250 | 1198 | 517 | 2449 |
| 8:00 | | | 484 | | 422 | | 906 | | 20:00 | | | 238 | | 293 | | 531 | |
| 8:15 | | | 488 | | 396 | | 884 | | 20:15 | | | 236 | | 216 | | 452 | |
| 8:30 | | | 528 | | 321 | | 849 | | 20:30 | | | 238 | | 216 | | 454 | |
| 8:45 | | | 494 | 1994 | 322 | 1461 | 816 | 3455 | 20:45 | | | 183 | 895 | 219 | 944 | 402 | 1839 |
| 9:00 | | | 425 | | 275 | | 700 | | 21:00 | | | 146 | | 209 | | 355 | |
| 9:15 | | | 351 | | 294 | | 645 | | 21:15 | | | 161 | | 191 | | 352 | |
| 9:30 | | | 356 | | 267 | | 623 | | 21:30 | | | 125 | | 139 | | 264 | |
| 9:45 | | | 346 | 1478 | 365 | 1201 | 711 | 2679 | 21:45 | | | 112 | 544 | 139 | 678 | 251 | 1222 |
| 10:00 | | | 367 | | 351 | | 718 | | 22:00 | | | 133 | | 116 | | 249 | |
| 10:15 | | | 412 | | 320 | | 732 | | 22:15 | | | 105 | | 83 | | 188 | |
| 10:30 | | | 373 | | 375 | | 748 | | 22:30 | | | 80 | | 82 | | 162 | |
| 10:45 | | | 360 | 1512 | 418 | 1464 | 778 | 2976 | 22:45 | | | 64 | 382 | 78 | 359 | 142 | 741 |
| 11:00 | | | 387 | | 360 | | 747 | | 23:00 | | | 36 | | 48 | | 84 | |
| 11:15 | | | 368 | | 418 | | 786 | | 23:15 | | | 50 | | 38 | | 88 | |
| 11:30 | | | 365 | | 423 | | 788 | | 23:30 | | | 32 | | 35 | | 67 | |
| 11:45 | | | 409 | 1529 | 428 | 1629 | 837 | 3158 | 23:45 | | | 34 | 152 | 22 | 143 | 56 | 295 |
| **TOTALS** | | | | 10738 | | 8989 | | **19727** | **TOTALS** | | | | 15811 | | 15446 | | **31257** |
| **SPLIT %** | | | | 54.4% | | 45.6% | | **38.7%** | **SPLIT %** | | | | 50.6% | | 49.4% | | **61.3%** |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 26,549 | 24,435 | 50,984 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM Peak Hour** | | | 7:45 | 11:45 | **7:45** | **PM Peak Hour** | | | 17:00 | 17:15 | **17:00** |
| **AM Pk Volume** | | | 2014 | 1724 | **3575** | **PM Pk Volume** | | | 2011 | 1877 | **3883** |
| **Pk Hr Factor** | | | 0.954 | 0.991 | **0.955** | **Pk Hr Factor** | | | 0.972 | 0.939 | **0.960** |
| **7 - 9 Volume** | 0 | 0 | 3773 | 2900 | **6673** | **4 - 6 Volume** | 0 | 0 | 3951 | 3717 | **7668** |
| **7 - 9 Peak Hour** | | | 7:45 | 7:30 | **7:45** | **4 - 6 Peak Hour** | | | 17:00 | 17:00 | **17:00** |
| **7 - 9 Pk Volume** | 0 | 0 | 2014 | 1624 | **3575** | **4 - 6 Pk Volume** | 0 | 0 | 2011 | 1872 | **3883** |
| **Pk Hr Factor** | 0.000 | 0.000 | 0.954 | 0.962 | **0.955** | **Pk Hr Factor** | 0.000 | 0.000 | 0.972 | 0.936 | **0.960** |

Prepared by NDS/ATD

# VOLUME

Imperial Hwy E/O Castlegate Ln/Placentia Ave

**Day:** Tuesday
**Date:** 11/13/2018

**City:** Brea
**Project #:** CA18_1233_015

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 26,188 | 24,966 | 51,154 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0:00 | | | 27 | | 20 | | 47 | | 12:00 | | | 398 | | 437 | | 835 | |
| 0:15 | | | 18 | | 18 | | 36 | | 12:15 | | | 448 | | 429 | | 877 | |
| 0:30 | | | 24 | | 15 | | 39 | | 12:30 | | | 419 | | 457 | | 876 | |
| 0:45 | | | 11 | 80 | 8 | 61 | 19 | 141 | 12:45 | | | 495 | 1760 | 415 | 1738 | 910 | 3498 |
| 1:00 | | | 11 | | 19 | | 30 | | 13:00 | | | 450 | | 421 | | 871 | |
| 1:15 | | | 16 | | 3 | | 19 | | 13:15 | | | 464 | | 428 | | 892 | |
| 1:30 | | | 13 | | 18 | | 31 | | 13:30 | | | 434 | | 464 | | 898 | |
| 1:45 | | | 17 | 57 | 13 | 53 | 30 | 110 | 13:45 | | | 456 | 1804 | 412 | 1725 | 868 | 3529 |
| 2:00 | | | 15 | | 14 | | 29 | | 14:00 | | | 444 | | 439 | | 883 | |
| 2:15 | | | 10 | | 6 | | 16 | | 14:15 | | | 415 | | 430 | | 845 | |
| 2:30 | | | 15 | | 7 | | 22 | | 14:30 | | | 426 | | 456 | | 882 | |
| 2:45 | | | 20 | 60 | 9 | 36 | 29 | 96 | 14:45 | | | 419 | 1704 | 399 | 1724 | 818 | 3428 |
| 3:00 | | | 10 | | 12 | | 22 | | 15:00 | | | 447 | | 434 | | 881 | |
| 3:15 | | | 7 | | 14 | | 21 | | 15:15 | | | 485 | | 448 | | 933 | |
| 3:30 | | | 21 | | 30 | | 51 | | 15:30 | | | 491 | | 478 | | 969 | |
| 3:45 | | | 31 | 69 | 25 | 81 | 56 | 150 | 15:45 | | | 500 | 1923 | 468 | 1828 | 968 | 3751 |
| 4:00 | | | 33 | | 36 | | 69 | | 16:00 | | | 454 | | 479 | | 933 | |
| 4:15 | | | 31 | | 40 | | 71 | | 16:15 | | | 482 | | 481 | | 963 | |
| 4:30 | | | 80 | | 63 | | 143 | | 16:30 | | | 469 | | 502 | | 971 | |
| 4:45 | | | 129 | 273 | 57 | 196 | 186 | 469 | 16:45 | | | 488 | 1893 | 462 | 1924 | 950 | 3817 |
| 5:00 | | | 78 | | 62 | | 140 | | 17:00 | | | 472 | | 491 | | 963 | |
| 5:15 | | | 114 | | 72 | | 186 | | 17:15 | | | 511 | | 523 | | 1034 | |
| 5:30 | | | 175 | | 136 | | 311 | | 17:30 | | | 481 | | 468 | | 949 | |
| 5:45 | | | 248 | 615 | 131 | 401 | 379 | 1016 | 17:45 | | | 494 | 1958 | 466 | 1948 | 960 | 3906 |
| 6:00 | | | 231 | | 191 | | 422 | | 18:00 | | | 431 | | 445 | | 876 | |
| 6:15 | | | 227 | | 164 | | 391 | | 18:15 | | | 438 | | 452 | | 890 | |
| 6:30 | | | 331 | | 236 | | 567 | | 18:30 | | | 450 | | 422 | | 872 | |
| 6:45 | | | 403 | 1192 | 295 | 886 | 698 | 2078 | 18:45 | | | 334 | 1653 | 331 | 1650 | 665 | 3303 |
| 7:00 | | | 388 | | 315 | | 703 | | 19:00 | | | 342 | | 341 | | 683 | |
| 7:15 | | | 391 | | 327 | | 718 | | 19:15 | | | 324 | | 338 | | 662 | |
| 7:30 | | | 406 | | 347 | | 753 | | 19:30 | | | 266 | | 304 | | 570 | |
| 7:45 | | | 467 | 1652 | 428 | 1417 | 895 | 3069 | 19:45 | | | 258 | 1190 | 260 | 1243 | 518 | 2433 |
| 8:00 | | | 444 | | 399 | | 843 | | 20:00 | | | 236 | | 307 | | 543 | |
| 8:15 | | | 426 | | 373 | | 799 | | 20:15 | | | 213 | | 251 | | 464 | |
| 8:30 | | | 491 | | 329 | | 820 | | 20:30 | | | 213 | | 221 | | 434 | |
| 8:45 | | | 465 | 1826 | 332 | 1433 | 797 | 3259 | 20:45 | | | 162 | 824 | 227 | 1006 | 389 | 1830 |
| 9:00 | | | 411 | | 325 | | 736 | | 21:00 | | | 121 | | 228 | | 349 | |
| 9:15 | | | 364 | | 312 | | 676 | | 21:15 | | | 143 | | 197 | | 340 | |
| 9:30 | | | 393 | | 271 | | 664 | | 21:30 | | | 107 | | 151 | | 258 | |
| 9:45 | | | 376 | 1544 | 368 | 1276 | 744 | 2820 | 21:45 | | | 106 | 477 | 141 | 717 | 247 | 1194 |
| 10:00 | | | 381 | | 355 | | 736 | | 22:00 | | | 103 | | 106 | | 209 | |
| 10:15 | | | 418 | | 315 | | 733 | | 22:15 | | | 85 | | 91 | | 176 | |
| 10:30 | | | 380 | | 381 | | 761 | | 22:30 | | | 68 | | 80 | | 148 | |
| 10:45 | | | 376 | 1555 | 413 | 1464 | 789 | 3019 | 22:45 | | | 49 | 305 | 73 | 350 | 122 | 655 |
| 11:00 | | | 384 | | 378 | | 762 | | 23:00 | | | 35 | | 52 | | 87 | |
| 11:15 | | | 411 | | 411 | | 822 | | 23:15 | | | 48 | | 40 | | 88 | |
| 11:30 | | | 393 | | 432 | | 825 | | 23:30 | | | 32 | | 34 | | 66 | |
| 11:45 | | | 440 | 1628 | 439 | 1660 | 879 | 3288 | 23:45 | | | 31 | 146 | 23 | 149 | 54 | 295 |
| **TOTALS** | | | | 10551 | | 8964 | | **19515** | **TOTALS** | | | | 15637 | | 16002 | | **31639** |
| **SPLIT %** | | | | 54.1% | | 45.9% | | **38.1%** | **SPLIT %** | | | | 49.4% | | 50.6% | | **61.9%** |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 26,188 | 24,966 | 51,154 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AM Peak Hour** | | | 7:45 | 11:45 | **11:45** | **PM Peak Hour** | | | 17:00 | 16:30 | **16:30** |
| **AM Pk Volume** | | | 1828 | 1762 | **3467** | **PM Pk Volume** | | | 1958 | 1978 | **3918** |
| **Pk Hr Factor** | | | 0.931 | 0.964 | **0.986** | **Pk Hr Factor** | | | 0.958 | 0.946 | **0.947** |
| **7 - 9 Volume** | 0 | 0 | 3478 | 2850 | **6328** | **4 - 6 Volume** | 0 | 0 | 3851 | 3872 | **7723** |
| **7 - 9 Peak Hour** | | | 7:45 | 7:30 | **7:45** | **4 - 6 Peak Hour** | | | 17:00 | 16:30 | **16:30** |
| **7 - 9 Pk Volume** | 0 | 0 | 1828 | 1547 | **3357** | **4 - 6 Pk Volume** | 0 | 0 | 1958 | 1978 | **3918** |
| **Pk Hr Factor** | 0.000 | 0.000 | 0.931 | 0.904 | **0.938** | **Pk Hr Factor** | 0.000 | 0.000 | 0.958 | 0.946 | **0.947** |

# APPENDIX C

## INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS – ICU

*APPENDIX C-I*

# EXISTING TRAFFIC CONDITIONS

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 ICU Network.vistro
Report File: N:\...\AM Ex.pdf

Scenario 1 AM Existing
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | ICU 1 | WB Thru | 0.703 | - | C |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | ICU 1 | WB Thru | 0.749 | - | C |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | ICU 1 | EB Thru | 0.820 | - | D |
| 4 | Randolph Avenue at Birch Street | Signalized | ICU 1 | EB Thru | 0.352 | - | A |
| 5 | State College Boulevard at Birch Street | Signalized | ICU 1 | SB Thru | 0.529 | - | A |
| 6 | S Associated Road at Birch Street | Signalized | ICU 1 | EB Thru | 0.619 | - | B |
| 7 | Randolph Avenue at Madison Way | Signalized | ICU 1 | NB Thru | 0.139 | - | A |
| 8 | Randolph Avenue at Brea Mall | Signalized | ICU 1 | NB Thru | 0.136 | - | A |
| 9 | Brea Mall South at State College Boulevard | Signalized | ICU 1 | WB Thru | 0.183 | - | A |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | ICU 1 | EB Right | 0.790 | - | C |
| 11 | Puente Street at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.573 | - | A |
| 12 | Brea Boulevard at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.787 | - | C |
| 13 | Randolph Avenue at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.420 | - | A |
| 14 | State College Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.701 | - | C |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.575 | - | A |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.570 | - | A |
| 17 | Associated Road at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.704 | - | C |
| 18 | Castlegate Lane/Placentia | Signalized | ICU 1 | EB Thru | 0.601 | | B |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.001 | - | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.703 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 151 | 192 | 133 | 865 | 582 | 8 | 14 | 1220 | 196 | 431 | 1519 | 534 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 151 | 192 | 133 | 865 | 582 | 8 | 14 | 1220 | 196 | 431 | 1519 | 534 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 38 | 48 | 33 | 216 | 146 | 2 | 4 | 305 | 49 | 108 | 380 | 134 |
| Total Analysis Volume [veh/h] | 151 | 192 | 133 | 865 | 582 | 8 | 14 | 1220 | 196 | 431 | 1519 | 534 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.06 | 0.06 | 0.25 | 0.17 | 0.17 | 0.00 | 0.21 | 0.21 | 0.13 | 0.30 | 0.06 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.703 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.749 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 1026 | 0 | 513 | 0 | 1659 | 565 | 217 | 2027 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 1026 | 0 | 513 | 0 | 1659 | 565 | 217 | 2027 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 257 | 0 | 128 | 0 | 415 | 141 | 54 | 507 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 1026 | 0 | 513 | 0 | 1659 | 565 | 217 | 2027 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.30 | 0.00 | 0.30 | 0.00 | 0.33 | 0.33 | 0.06 | 0.40 | 0.00 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.749 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.820 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | | | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1019 | 0 | 482 | 0 | 0 | 0 | 275 | 2399 | 0 | 0 | 1237 | 475 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1019 | 0 | 482 | 0 | 0 | 0 | 275 | 2399 | 0 | 0 | 1237 | 475 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 255 | 0 | 121 | 0 | 0 | 0 | 69 | 600 | 0 | 0 | 309 | 119 |
| Total Analysis Volume [veh/h] | 1019 | 0 | 482 | 0 | 0 | 0 | 275 | 2399 | 0 | 0 | 1237 | 475 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.30 | 0.00 | 0.28 | 0.00 | 0.00 | 0.00 | 0.08 | 0.47 | 0.00 | 0.00 | 0.25 | 0.25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.820 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.352 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 23 | 40 | 85 | 37 | 35 | 25 | 39 | 554 | 89 | 70 | 468 | 43 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 23 | 40 | 85 | 37 | 35 | 25 | 39 | 554 | 89 | 70 | 468 | 43 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 6 | 10 | 21 | 9 | 9 | 6 | 10 | 139 | 22 | 18 | 117 | 11 |
| Total Analysis Volume [veh/h] | 23 | 40 | 85 | 37 | 35 | 25 | 39 | 554 | 89 | 70 | 468 | 43 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.01 | 0.02 | 0.05 | 0.02 | 0.04 | 0.04 | 0.02 | 0.19 | 0.19 | 0.04 | 0.14 | 0.03 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.352 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.529 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 76 | 120 | 96 | 628 | 779 | 145 | 75 | 502 | 47 | 78 | 555 | 273 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 76 | 120 | 96 | 628 | 779 | 145 | 75 | 502 | 47 | 78 | 555 | 273 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 19 | 30 | 24 | 157 | 195 | 36 | 19 | 126 | 12 | 20 | 139 | 68 |
| Total Analysis Volume [veh/h] | 76 | 120 | 96 | 628 | 779 | 145 | 75 | 502 | 47 | 78 | 555 | 273 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.04 | 0.06 | 0.18 | 0.27 | 0.27 | 0.02 | 0.15 | 0.03 | 0.02 | 0.16 | 0.16 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.529 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.619 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 234 | 6 | 307 | 55 | 28 | 8 | 2 | 909 | 302 | 341 | 747 | 11 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 234 | 6 | 307 | 55 | 28 | 8 | 2 | 909 | 302 | 341 | 747 | 11 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 59 | 2 | 77 | 14 | 7 | 2 | 1 | 227 | 76 | 85 | 187 | 3 |
| Total Analysis Volume [veh/h] | 234 | 6 | 307 | 55 | 28 | 8 | 2 | 909 | 302 | 341 | 747 | 11 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.07 | 0.00 | 0.08 | 0.03 | 0.02 | 0.02 | 0.00 | 0.36 | 0.36 | 0.10 | 0.22 | 0.22 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.619 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.139 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 25 | 130 | 8 | 6 | 119 | 14 | 32 | 2 | 57 | 0 | 0 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 25 | 130 | 8 | 6 | 119 | 14 | 32 | 2 | 57 | 0 | 0 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 6 | 33 | 2 | 2 | 30 | 4 | 8 | 1 | 14 | 0 | 0 | 0 |
| Total Analysis Volume [veh/h] | 25 | 130 | 8 | 6 | 119 | 14 | 32 | 2 | 57 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.04 | 0.04 | 0.00 | 0.04 | 0.04 | 0.02 | 0.03 | 0.03 | 0.00 | 0.00 | 0.00 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.139 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.136 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 13 | 163 | 66 | 15 | 141 | 6 | 1 | 0 | 1 | 26 | 0 | 5 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 13 | 163 | 66 | 15 | 141 | 6 | 1 | 0 | 1 | 26 | 0 | 5 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 3 | 41 | 17 | 4 | 35 | 2 | 0 | 0 | 0 | 7 | 0 | 1 |
| Total Analysis Volume [veh/h] | 13 | 163 | 66 | 15 | 141 | 6 | 1 | 0 | 1 | 26 | 0 | 5 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.07 | 0.07 | 0.01 | 0.04 | 0.04 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.136 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.183 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 32 | 5 | 15 | 3 | 2 | 27 | 77 | 238 | 15 | 27 | 319 | 12 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 32 | 5 | 15 | 3 | 2 | 27 | 77 | 238 | 15 | 27 | 319 | 12 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 8 | 1 | 4 | 1 | 1 | 7 | 19 | 60 | 4 | 7 | 80 | 3 |
| Total Analysis Volume [veh/h] | 32 | 5 | 15 | 3 | 2 | 27 | 77 | 238 | 15 | 27 | 319 | 12 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 0.07 | 0.07 | 0.02 | 0.10 | 0.10 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.183 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.790 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 302 | 601 | 259 | 143 | 1241 | 279 | 183 | 1296 | 361 | 282 | 1143 | 99 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 302 | 601 | 259 | 143 | 1241 | 279 | 183 | 1296 | 361 | 282 | 1143 | 99 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 76 | 150 | 65 | 36 | 310 | 70 | 46 | 324 | 90 | 71 | 286 | 25 |
| Total Analysis Volume [veh/h] | 302 | 601 | 259 | 143 | 1241 | 279 | 183 | 1296 | 361 | 282 | 1143 | 99 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.09 | 0.12 | 0.15 | 0.04 | 0.24 | 0.16 | 0.05 | 0.32 | 0.32 | 0.08 | 0.22 | 0.06 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.790 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.573 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 59 | 113 | 152 | 120 | 84 | 133 | 218 | 1314 | 78 | 48 | 1195 | 156 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 59 | 113 | 152 | 120 | 84 | 133 | 218 | 1314 | 78 | 48 | 1195 | 156 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 15 | 28 | 38 | 30 | 21 | 33 | 55 | 329 | 20 | 12 | 299 | 39 |
| Total Analysis Volume [veh/h] | 59 | 113 | 152 | 120 | 84 | 133 | 218 | 1314 | 78 | 48 | 1195 | 156 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.03 | 0.07 | 0.09 | 0.07 | 0.02 | 0.08 | 0.13 | 0.27 | 0.27 | 0.03 | 0.23 | 0.09 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.573 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.787 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 426 | 452 | 142 | 126 | 944 | 163 | 130 | 1478 | 345 | 150 | 1409 | 63 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 426 | 452 | 142 | 126 | 944 | 163 | 130 | 1478 | 345 | 150 | 1409 | 63 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 107 | 113 | 36 | 32 | 236 | 41 | 33 | 370 | 86 | 38 | 352 | 16 |
| Total Analysis Volume [veh/h] | 426 | 452 | 142 | 126 | 944 | 163 | 130 | 1478 | 345 | 150 | 1409 | 63 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.13 | 0.09 | 0.08 | 0.04 | 0.28 | 0.10 | 0.04 | 0.29 | 0.20 | 0.04 | 0.28 | 0.04 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.787 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.420 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 15 | 14 | 53 | 125 | 14 | 29 | 58 | 1516 | 9 | 24 | 1466 | 143 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 15 | 14 | 53 | 125 | 14 | 29 | 58 | 1516 | 9 | 24 | 1466 | 143 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 4 | 13 | 31 | 4 | 7 | 15 | 379 | 2 | 6 | 367 | 36 |
| Total Analysis Volume [veh/h] | 15 | 14 | 53 | 125 | 14 | 29 | 58 | 1516 | 9 | 24 | 1466 | 143 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

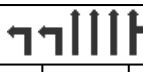
**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.02 | 0.02 | 0.04 | 0.03 | 0.03 | 0.02 | 0.30 | 0.30 | 0.01 | 0.29 | 0.08 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.420 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.701 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 97 | 137 | 397 | 84 | 341 | 26 | 33 | 1518 | 171 | 431 | 1517 | 134 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 97 | 137 | 397 | 84 | 341 | 26 | 33 | 1518 | 171 | 431 | 1517 | 134 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 24 | 34 | 99 | 21 | 85 | 7 | 8 | 380 | 43 | 108 | 379 | 34 |
| Total Analysis Volume [veh/h] | 97 | 137 | 397 | 84 | 341 | 26 | 33 | 1518 | 171 | 431 | 1517 | 134 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.03 | 0.04 | 0.23 | 0.04 | 0.11 | 0.11 | 0.01 | 0.25 | 0.25 | 0.13 | 0.30 | 0.04 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.701 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.575 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 574 | 0 | 460 | 0 | 1410 | 639 | 0 | 1645 | 180 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 574 | 0 | 460 | 0 | 1410 | 639 | 0 | 1645 | 180 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 144 | 0 | 115 | 0 | 353 | 160 | 0 | 411 | 45 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 574 | 0 | 460 | 0 | 1410 | 639 | 0 | 1645 | 180 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |

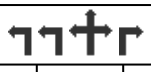
**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.17 | 0.00 | 0.20 | 0.00 | 0.28 | 0.00 | 0.00 | 0.32 | 0.00 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.575 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.570 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 831 | 43 | 783 | 0 | 0 | 50 | 116 | 1281 | 531 | 0 | 1400 | 18 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 831 | 43 | 783 | 0 | 0 | 50 | 116 | 1281 | 531 | 0 | 1400 | 18 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 208 | 11 | 196 | 0 | 0 | 13 | 29 | 320 | 133 | 0 | 350 | 5 |
| Total Analysis Volume [veh/h] | 831 | 43 | 783 | 0 | 0 | 50 | 116 | 1281 | 531 | 0 | 1400 | 18 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.16 | 0.24 | 0.24 | 0.00 | 0.00 | 0.00 | 0.07 | 0.25 | 0.00 | 0.00 | 0.21 | 0.21 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.570 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.704 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 144 | 202 | 69 | 145 | 320 | 143 | 145 | 1794 | 97 | 89 | 1538 | 82 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 144 | 202 | 69 | 145 | 320 | 143 | 145 | 1794 | 97 | 89 | 1538 | 82 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 36 | 51 | 17 | 36 | 80 | 36 | 36 | 449 | 24 | 22 | 385 | 21 |
| Total Analysis Volume [veh/h] | 144 | 202 | 69 | 145 | 320 | 143 | 145 | 1794 | 97 | 89 | 1538 | 82 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.08 | 0.08 | 0.04 | 0.19 | 0.08 | 0.09 | 0.37 | 0.37 | 0.05 | 0.24 | 0.24 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.704 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.601 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 168 | 12 | 141 | 24 | 27 | 14 | 13 | 1756 | 347 | 170 | 1406 | 32 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 168 | 12 | 141 | 24 | 27 | 14 | 13 | 1756 | 347 | 170 | 1406 | 32 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 42 | 3 | 35 | 6 | 7 | 4 | 3 | 439 | 87 | 43 | 352 | 8 |
| Total Analysis Volume [veh/h] | 168 | 12 | 141 | 24 | 27 | 14 | 13 | 1756 | 347 | 170 | 1406 | 32 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.05 | 0.05 | 0.08 | 0.01 | 0.02 | 0.02 | 0.01 | 0.34 | 0.20 | 0.10 | 0.28 | 0.28 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.601 | | | | | | | | | | | |

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 ICU Network.vistro
Report File: N:\...\PM Ex.pdf

Scenario 2 PM Existing
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | ICU 1 | WB Right | 0.676 | - | B |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | ICU 1 | WB Thru | 0.614 | - | B |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | ICU 1 | EB Thru | 0.568 | - | A |
| 4 | Randolph Avenue at Birch Street | Signalized | ICU 1 | WB Thru | 0.566 | - | A |
| 5 | State College Boulevard at Birch Street | Signalized | ICU 1 | WB Right | 0.673 | - | B |
| 6 | S Associated Road at Birch Street | Signalized | ICU 1 | WB Thru | 0.619 | - | B |
| 7 | Randolph Avenue at Madison Way | Signalized | ICU 1 | NB Thru | 0.243 | - | A |
| 8 | Randolph Avenue at Brea Mall | Signalized | ICU 1 | NB Thru | 0.358 | - | A |
| 9 | Brea Mall South at State College Boulevard | Signalized | ICU 1 | EB Thru | 0.442 | - | A |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.770 | - | C |
| 11 | Puente Street at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.589 | - | A |
| 12 | Brea Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.773 | - | C |
| 13 | Randolph Avenue at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.647 | - | B |
| 14 | State College Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.862 | - | D |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.705 | - | C |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.712 | - | C |
| 17 | Associated Road at Imperial Highway | Signalized | ICU 1 | EB Right | 0.780 | - | C |
| 18 | Castlegate Lane/Placentia | Signalized | ICU 1 | WB Thru | 0.699 | | B |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.699 | - | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.676 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 302 | 576 | 253 | 545 | 372 | 15 | 38 | 1140 | 245 | 316 | 1008 | 686 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 302 | 576 | 253 | 545 | 372 | 15 | 38 | 1140 | 245 | 316 | 1008 | 686 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 76 | 144 | 63 | 136 | 93 | 4 | 10 | 285 | 61 | 79 | 252 | 172 |
| Total Analysis Volume [veh/h] | 302 | 576 | 253 | 545 | 372 | 15 | 38 | 1140 | 245 | 316 | 1008 | 686 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.09 | 0.17 | 0.15 | 0.16 | 0.11 | 0.11 | 0.01 | 0.20 | 0.20 | 0.09 | 0.20 | 0.24 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.676 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.614 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 443 | 0 | 697 | 0 | 1115 | 746 | 226 | 1610 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 443 | 0 | 697 | 0 | 1115 | 746 | 226 | 1610 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 111 | 0 | 174 | 0 | 279 | 187 | 57 | 403 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 443 | 0 | 697 | 0 | 1115 | 746 | 226 | 1610 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.13 | 0.00 | 0.22 | 0.00 | 0.27 | 0.27 | 0.07 | 0.32 | 0.00 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.614 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.568 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | | | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 636 | 0 | 260 | 0 | 0 | 0 | 356 | 1407 | 0 | 0 | 1024 | 511 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 636 | 0 | 260 | 0 | 0 | 0 | 356 | 1407 | 0 | 0 | 1024 | 511 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 159 | 0 | 65 | 0 | 0 | 0 | 89 | 352 | 0 | 0 | 256 | 128 |
| Total Analysis Volume [veh/h] | 636 | 0 | 260 | 0 | 0 | 0 | 356 | 1407 | 0 | 0 | 1024 | 511 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.19 | 0.00 | 0.15 | 0.00 | 0.00 | 0.00 | 0.10 | 0.28 | 0.00 | 0.00 | 0.23 | 0.23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.568 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.566 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 129 | 56 | 162 | 50 | 48 | 106 | 77 | 608 | 93 | 183 | 1034 | 38 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 129 | 56 | 162 | 50 | 48 | 106 | 77 | 608 | 93 | 183 | 1034 | 38 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 32 | 14 | 41 | 13 | 12 | 27 | 19 | 152 | 23 | 46 | 259 | 10 |
| Total Analysis Volume [veh/h] | 129 | 56 | 162 | 50 | 48 | 106 | 77 | 608 | 93 | 183 | 1034 | 38 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.08 | 0.03 | 0.10 | 0.03 | 0.09 | 0.09 | 0.05 | 0.21 | 0.21 | 0.11 | 0.30 | 0.02 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.566 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.673 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 139 | 353 | 156 | 310 | 324 | 257 | 194 | 741 | 154 | 141 | 949 | 602 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 139 | 353 | 156 | 310 | 324 | 257 | 194 | 741 | 154 | 141 | 949 | 602 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 35 | 88 | 39 | 78 | 81 | 64 | 49 | 185 | 39 | 35 | 237 | 151 |
| Total Analysis Volume [veh/h] | 139 | 353 | 156 | 310 | 324 | 257 | 194 | 741 | 154 | 141 | 949 | 602 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.10 | 0.09 | 0.09 | 0.17 | 0.17 | 0.06 | 0.22 | 0.09 | 0.04 | 0.28 | 0.35 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.673 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.619 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 460 | 32 | 342 | 11 | 19 | 6 | 13 | 855 | 287 | 284 | 1213 | 17 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 460 | 32 | 342 | 11 | 19 | 6 | 13 | 855 | 287 | 284 | 1213 | 17 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 115 | 8 | 86 | 3 | 5 | 2 | 3 | 214 | 72 | 71 | 303 | 4 |
| Total Analysis Volume [veh/h] | 460 | 32 | 342 | 11 | 19 | 6 | 13 | 855 | 287 | 284 | 1213 | 17 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.14 | 0.02 | 0.12 | 0.01 | 0.01 | 0.01 | 0.01 | 0.34 | 0.34 | 0.08 | 0.36 | 0.36 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.619 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.243 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 46 | 308 | 41 | 27 | 245 | 27 | 60 | 4 | 50 | 72 | 4 | 37 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 46 | 308 | 41 | 27 | 245 | 27 | 60 | 4 | 50 | 72 | 4 | 37 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 12 | 77 | 10 | 7 | 61 | 7 | 15 | 1 | 13 | 18 | 1 | 9 |
| Total Analysis Volume [veh/h] | 46 | 308 | 41 | 27 | 245 | 27 | 60 | 4 | 50 | 72 | 4 | 37 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.03 | 0.10 | 0.10 | 0.02 | 0.08 | 0.08 | 0.04 | 0.03 | 0.03 | 0.04 | 0.02 | 0.02 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.243 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.358 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 16 | 314 | 310 | 36 | 345 | 19 | 17 | 3 | 12 | 263 | 3 | 45 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 16 | 314 | 310 | 36 | 345 | 19 | 17 | 3 | 12 | 263 | 3 | 45 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 79 | 78 | 9 | 86 | 5 | 4 | 1 | 3 | 66 | 1 | 11 |
| Total Analysis Volume [veh/h] | 16 | 314 | 310 | 36 | 345 | 19 | 17 | 3 | 12 | 263 | 3 | 45 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.18 | 0.18 | 0.02 | 0.11 | 0.11 | 0.01 | 0.01 | 0.01 | 0.08 | 0.12 | 0.12 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.358 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.442 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 138 | 19 | 64 | 43 | 13 | 368 | 475 | 494 | 22 | 95 | 414 | 26 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 138 | 19 | 64 | 43 | 13 | 368 | 475 | 494 | 22 | 95 | 414 | 26 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 35 | 5 | 16 | 11 | 3 | 92 | 119 | 124 | 6 | 24 | 104 | 7 |
| Total Analysis Volume [veh/h] | 138 | 19 | 64 | 43 | 13 | 368 | 475 | 494 | 22 | 95 | 414 | 26 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.05 | 0.04 | 0.03 | 0.01 | 0.08 | 0.14 | 0.15 | 0.15 | 0.06 | 0.13 | 0.13 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.442 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.770 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 426 | 1091 | 211 | 196 | 852 | 306 | 268 | 1189 | 287 | 425 | 1498 | 219 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 426 | 1091 | 211 | 196 | 852 | 306 | 268 | 1189 | 287 | 425 | 1498 | 219 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 107 | 273 | 53 | 49 | 213 | 77 | 67 | 297 | 72 | 106 | 375 | 55 |
| Total Analysis Volume [veh/h] | 426 | 1091 | 211 | 196 | 852 | 306 | 268 | 1189 | 287 | 425 | 1498 | 219 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.13 | 0.21 | 0.12 | 0.06 | 0.17 | 0.18 | 0.08 | 0.29 | 0.29 | 0.13 | 0.29 | 0.13 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.770 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.589 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 35 | 47 | 81 | 163 | 104 | 204 | 125 | 1421 | 37 | 103 | 1643 | 253 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 35 | 47 | 81 | 163 | 104 | 204 | 125 | 1421 | 37 | 103 | 1643 | 253 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 9 | 12 | 20 | 41 | 26 | 51 | 31 | 355 | 9 | 26 | 411 | 63 |
| Total Analysis Volume [veh/h] | 35 | 47 | 81 | 163 | 104 | 204 | 125 | 1421 | 37 | 103 | 1643 | 253 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.02 | 0.03 | 0.05 | 0.10 | 0.03 | 0.12 | 0.07 | 0.29 | 0.29 | 0.06 | 0.32 | 0.15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.589 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.773 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 504 | 802 | 243 | 205 | 629 | 175 | 187 | 1650 | 405 | 224 | 1687 | 138 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 504 | 802 | 243 | 205 | 629 | 175 | 187 | 1650 | 405 | 224 | 1687 | 138 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 126 | 201 | 61 | 51 | 157 | 44 | 47 | 413 | 101 | 56 | 422 | 35 |
| Total Analysis Volume [veh/h] | 504 | 802 | 243 | 205 | 629 | 175 | 187 | 1650 | 405 | 224 | 1687 | 138 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.15 | 0.16 | 0.14 | 0.06 | 0.19 | 0.10 | 0.06 | 0.32 | 0.24 | 0.07 | 0.33 | 0.08 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.773 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.647 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 43 | 33 | 59 | 314 | 24 | 208 | 245 | 1593 | 27 | 56 | 1841 | 322 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 43 | 33 | 59 | 314 | 24 | 208 | 245 | 1593 | 27 | 56 | 1841 | 322 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 11 | 8 | 15 | 79 | 6 | 52 | 61 | 398 | 7 | 14 | 460 | 81 |
| Total Analysis Volume [veh/h] | 43 | 33 | 59 | 314 | 24 | 208 | 245 | 1593 | 27 | 56 | 1841 | 322 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.03 | 0.03 | 0.03 | 0.09 | 0.14 | 0.14 | 0.07 | 0.32 | 0.32 | 0.03 | 0.36 | 0.19 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.647 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.862 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 351 | 536 | 344 | 417 | 275 | 93 | 107 | 1759 | 91 | 439 | 1787 | 465 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 351 | 536 | 344 | 417 | 275 | 93 | 107 | 1759 | 91 | 439 | 1787 | 465 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 88 | 134 | 86 | 104 | 69 | 23 | 27 | 440 | 23 | 110 | 447 | 116 |
| Total Analysis Volume [veh/h] | 351 | 536 | 344 | 417 | 275 | 93 | 107 | 1759 | 91 | 439 | 1787 | 465 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.10 | 0.16 | 0.20 | 0.21 | 0.11 | 0.11 | 0.03 | 0.27 | 0.27 | 0.13 | 0.35 | 0.07 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.862 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.705 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 651 | 0 | 522 | 0 | 1637 | 902 | 0 | 2170 | 386 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 651 | 0 | 522 | 0 | 1637 | 902 | 0 | 2170 | 386 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 163 | 0 | 131 | 0 | 409 | 226 | 0 | 543 | 97 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 651 | 0 | 522 | 0 | 1637 | 902 | 0 | 2170 | 386 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |

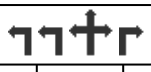
**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.19 | 0.00 | 0.23 | 0.00 | 0.32 | 0.00 | 0.00 | 0.43 | 0.00 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.705 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.712 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 886 | 72 | 408 | 0 | 0 | 231 | 206 | 1738 | 360 | 0 | 2267 | 46 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 886 | 72 | 408 | 0 | 0 | 231 | 206 | 1738 | 360 | 0 | 2267 | 46 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 222 | 18 | 102 | 0 | 0 | 58 | 52 | 435 | 90 | 0 | 567 | 12 |
| Total Analysis Volume [veh/h] | 886 | 72 | 408 | 0 | 0 | 231 | 206 | 1738 | 360 | 0 | 2267 | 46 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.17 | 0.20 | 0.20 | 0.00 | 0.00 | 0.00 | 0.12 | 0.34 | 0.00 | 0.00 | 0.34 | 0.34 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.712 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.780 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 211 | 252 | 82 | 284 | 339 | 218 | 247 | 1745 | 137 | 170 | 1641 | 166 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 211 | 252 | 82 | 284 | 339 | 218 | 247 | 1745 | 137 | 170 | 1641 | 166 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 53 | 63 | 21 | 71 | 85 | 55 | 62 | 436 | 34 | 43 | 410 | 42 |
| Total Analysis Volume [veh/h] | 211 | 252 | 82 | 284 | 339 | 218 | 247 | 1745 | 137 | 170 | 1641 | 166 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.06 | 0.10 | 0.10 | 0.08 | 0.20 | 0.13 | 0.15 | 0.37 | 0.37 | 0.10 | 0.27 | 0.27 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.780 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.699 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 235 | 46 | 258 | 24 | 22 | 14 | 18 | 1755 | 274 | 224 | 1806 | 55 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 235 | 46 | 258 | 24 | 22 | 14 | 18 | 1755 | 274 | 224 | 1806 | 55 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 59 | 12 | 65 | 6 | 6 | 4 | 5 | 439 | 69 | 56 | 452 | 14 |
| Total Analysis Volume [veh/h] | 235 | 46 | 258 | 24 | 22 | 14 | 18 | 1755 | 274 | 224 | 1806 | 55 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.07 | 0.08 | 0.15 | 0.01 | 0.02 | 0.02 | 0.01 | 0.34 | 0.16 | 0.13 | 0.36 | 0.36 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.699 | | | | | | | | | | | |

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 ICU Network.vistro
Report File: N:\...\Sat Ex.pdf

Scenario 3 Sat MD Existing
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | ICU 1 | WB Thru | 0.679 | - | B |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | ICU 1 | SB Right | 0.730 | - | C |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | ICU 1 | NB Left | 0.686 | - | B |
| 4 | Randolph Avenue at Birch Street | Signalized | ICU 1 | WB Thru | 0.468 | - | A |
| 5 | State College Boulevard at Birch Street | Signalized | ICU 1 | SB Thru | 0.633 | - | B |
| 6 | S Associated Road at Birch Street | Signalized | ICU 1 | EB Thru | 0.514 | - | A |
| 7 | Randolph Avenue at Madison Way | Signalized | ICU 1 | NB Thru | 0.291 | - | A |
| 8 | Randolph Avenue at Brea Mall | Signalized | ICU 1 | NB Thru | 0.449 | - | A |
| 9 | Brea Mall South at State College Boulevard | Signalized | ICU 1 | EB Left | 0.588 | - | A |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.681 | - | B |
| 11 | Puente Street at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.477 | - | A |
| 12 | Brea Boulevard at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.779 | - | C |
| 13 | Randolph Avenue at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.720 | - | C |
| 14 | State College Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 1.092 | - | F |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.779 | - | C |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.831 | - | D |
| 17 | Associated Road at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.713 | - | C |
| 18 | Castlegate Lane/Placentia | Signalized | ICU 1 | EB Thru | 0.675 | | B |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.675 | - | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.679 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 128 | 247 | 318 | 496 | 351 | 5 | 18 | 970 | 259 | 650 | 1334 | 689 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 128 | 247 | 318 | 496 | 351 | 5 | 18 | 970 | 259 | 650 | 1334 | 689 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 32 | 62 | 80 | 124 | 88 | 1 | 5 | 243 | 65 | 163 | 334 | 172 |
| Total Analysis Volume [veh/h] | 128 | 247 | 318 | 496 | 351 | 5 | 18 | 970 | 259 | 650 | 1334 | 689 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.11 | 0.11 | 0.15 | 0.10 | 0.10 | 0.01 | 0.18 | 0.18 | 0.19 | 0.26 | 0.26 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.679 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.730 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 794 | 0 | 1020 | 0 | 1250 | 520 | 165 | 1654 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 794 | 0 | 1020 | 0 | 1250 | 520 | 165 | 1654 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 199 | 0 | 255 | 0 | 313 | 130 | 41 | 414 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 794 | 0 | 1020 | 0 | 1250 | 520 | 165 | 1654 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.23 | 0.00 | 0.36 | 0.00 | 0.26 | 0.26 | 0.05 | 0.32 | 0.00 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.730 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.686 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1031 | 0 | 421 | 0 | 0 | 0 | 539 | 1510 | 0 | 0 | 788 | 399 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1031 | 0 | 421 | 0 | 0 | 0 | 539 | 1510 | 0 | 0 | 788 | 399 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 258 | 0 | 105 | 0 | 0 | 0 | 135 | 378 | 0 | 0 | 197 | 100 |
| Total Analysis Volume [veh/h] | 1031 | 0 | 421 | 0 | 0 | 0 | 539 | 1510 | 0 | 0 | 788 | 399 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.30 | 0.00 | 0.25 | 0.00 | 0.00 | 0.00 | 0.16 | 0.30 | 0.00 | 0.00 | 0.17 | 0.17 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.686 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.468 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 96 | 74 | 168 | 54 | 37 | 77 | 86 | 564 | 121 | 146 | 710 | 25 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 96 | 74 | 168 | 54 | 37 | 77 | 86 | 564 | 121 | 146 | 710 | 25 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 24 | 19 | 42 | 14 | 9 | 19 | 22 | 141 | 30 | 37 | 178 | 6 |
| Total Analysis Volume [veh/h] | 96 | 74 | 168 | 54 | 37 | 77 | 86 | 564 | 121 | 146 | 710 | 25 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.06 | 0.04 | 0.10 | 0.03 | 0.07 | 0.07 | 0.05 | 0.20 | 0.20 | 0.09 | 0.21 | 0.01 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.468 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.633 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 123 | 263 | 176 | 252 | 549 | 429 | 225 | 691 | 162 | 164 | 656 | 216 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 123 | 263 | 176 | 252 | 549 | 429 | 225 | 691 | 162 | 164 | 656 | 216 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 31 | 66 | 44 | 63 | 137 | 107 | 56 | 173 | 41 | 41 | 164 | 54 |
| Total Analysis Volume [veh/h] | 123 | 263 | 176 | 252 | 549 | 429 | 225 | 691 | 162 | 164 | 656 | 216 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.08 | 0.10 | 0.07 | 0.29 | 0.29 | 0.07 | 0.20 | 0.10 | 0.05 | 0.19 | 0.13 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.633 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.514 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 318 | 19 | 167 | 12 | 21 | 13 | 8 | 705 | 334 | 152 | 689 | 13 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 318 | 19 | 167 | 12 | 21 | 13 | 8 | 705 | 334 | 152 | 689 | 13 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 80 | 5 | 42 | 3 | 5 | 3 | 2 | 176 | 84 | 38 | 172 | 3 |
| Total Analysis Volume [veh/h] | 318 | 19 | 167 | 12 | 21 | 13 | 8 | 705 | 334 | 152 | 689 | 13 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.09 | 0.01 | 0.05 | 0.01 | 0.02 | 0.02 | 0.00 | 0.31 | 0.31 | 0.04 | 0.21 | 0.21 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.514 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.291 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 21 | 273 | 111 | 69 | 259 | 20 | 34 | 11 | 58 | 80 | 4 | 57 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 21 | 273 | 111 | 69 | 259 | 20 | 34 | 11 | 58 | 80 | 4 | 57 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 5 | 68 | 28 | 17 | 65 | 5 | 9 | 3 | 15 | 20 | 1 | 14 |
| Total Analysis Volume [veh/h] | 21 | 273 | 111 | 69 | 259 | 20 | 34 | 11 | 58 | 80 | 4 | 57 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.01 | 0.11 | 0.11 | 0.04 | 0.08 | 0.08 | 0.02 | 0.04 | 0.04 | 0.05 | 0.04 | 0.04 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.291 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.449 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 22 | 324 | 414 | 41 | 292 | 21 | 24 | 14 | 26 | 380 | 6 | 75 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 22 | 324 | 414 | 41 | 292 | 21 | 24 | 14 | 26 | 380 | 6 | 75 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 6 | 81 | 104 | 10 | 73 | 5 | 6 | 4 | 7 | 95 | 2 | 19 |
| Total Analysis Volume [veh/h] | 22 | 324 | 414 | 41 | 292 | 21 | 24 | 14 | 26 | 380 | 6 | 75 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.22 | 0.22 | 0.02 | 0.09 | 0.09 | 0.01 | 0.02 | 0.02 | 0.11 | 0.18 | 0.18 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.449 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.588 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 168 | 24 | 90 | 60 | 19 | 509 | 651 | 350 | 29 | 86 | 583 | 35 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 168 | 24 | 90 | 60 | 19 | 509 | 651 | 350 | 29 | 86 | 583 | 35 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 42 | 6 | 23 | 15 | 5 | 127 | 163 | 88 | 7 | 22 | 146 | 9 |
| Total Analysis Volume [veh/h] | 168 | 24 | 90 | 60 | 19 | 509 | 651 | 350 | 29 | 86 | 583 | 35 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.05 | 0.06 | 0.05 | 0.04 | 0.01 | 0.11 | 0.19 | 0.11 | 0.11 | 0.05 | 0.18 | 0.18 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.588 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.681 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 343 | 746 | 198 | 210 | 775 | 270 | 315 | 1105 | 272 | 345 | 1206 | 175 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 343 | 746 | 198 | 210 | 775 | 270 | 315 | 1105 | 272 | 345 | 1206 | 175 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 86 | 187 | 50 | 53 | 194 | 68 | 79 | 276 | 68 | 86 | 302 | 44 |
| Total Analysis Volume [veh/h] | 343 | 746 | 198 | 210 | 775 | 270 | 315 | 1105 | 272 | 345 | 1206 | 175 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.10 | 0.15 | 0.12 | 0.06 | 0.15 | 0.16 | 0.09 | 0.27 | 0.27 | 0.10 | 0.24 | 0.10 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.681 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.477 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 26 | 30 | 93 | 121 | 42 | 114 | 69 | 1269 | 36 | 77 | 1308 | 148 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 26 | 30 | 93 | 121 | 42 | 114 | 69 | 1269 | 36 | 77 | 1308 | 148 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 8 | 23 | 30 | 11 | 29 | 17 | 317 | 9 | 19 | 327 | 37 |
| Total Analysis Volume [veh/h] | 26 | 30 | 93 | 121 | 42 | 114 | 69 | 1269 | 36 | 77 | 1308 | 148 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.02 | 0.05 | 0.07 | 0.01 | 0.07 | 0.04 | 0.26 | 0.26 | 0.05 | 0.26 | 0.09 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.477 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.779 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 399 | 471 | 260 | 259 | 826 | 173 | 176 | 1379 | 255 | 333 | 1305 | 145 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 399 | 471 | 260 | 259 | 826 | 173 | 176 | 1379 | 255 | 333 | 1305 | 145 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 100 | 118 | 65 | 65 | 207 | 43 | 44 | 345 | 64 | 83 | 326 | 36 |
| Total Analysis Volume [veh/h] | 399 | 471 | 260 | 259 | 826 | 173 | 176 | 1379 | 255 | 333 | 1305 | 145 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.12 | 0.09 | 0.15 | 0.08 | 0.24 | 0.10 | 0.05 | 0.27 | 0.15 | 0.10 | 0.26 | 0.09 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.779 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.720 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 67 | 38 | 172 | 398 | 76 | 285 | 307 | 1422 | 32 | 109 | 1561 | 450 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 67 | 38 | 172 | 398 | 76 | 285 | 307 | 1422 | 32 | 109 | 1561 | 450 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 17 | 10 | 43 | 100 | 19 | 71 | 77 | 356 | 8 | 27 | 390 | 113 |
| Total Analysis Volume [veh/h] | 67 | 38 | 172 | 398 | 76 | 285 | 307 | 1422 | 32 | 109 | 1561 | 450 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

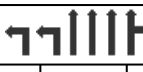
**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.06 | 0.06 | 0.12 | 0.21 | 0.21 | 0.09 | 0.29 | 0.29 | 0.06 | 0.31 | 0.26 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.720 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | F |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.092 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 265 | 499 | 562 | 561 | 376 | 177 | 132 | 1491 | 176 | 633 | 1763 | 922 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 265 | 499 | 562 | 561 | 376 | 177 | 132 | 1491 | 176 | 633 | 1763 | 922 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 66 | 125 | 141 | 140 | 94 | 44 | 33 | 373 | 44 | 158 | 441 | 231 |
| Total Analysis Volume [veh/h] | 265 | 499 | 562 | 561 | 376 | 177 | 132 | 1491 | 176 | 633 | 1763 | 922 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.08 | 0.15 | 0.33 | 0.28 | 0.16 | 0.16 | 0.04 | 0.25 | 0.25 | 0.19 | 0.35 | 0.26 |
| Intersection LOS | F | | | | | | | | | | | |
| Intersection V/C | 1.092 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.779 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 536 | 0 | 726 | 0 | 1895 | 1011 | 0 | 2455 | 353 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 536 | 0 | 726 | 0 | 1895 | 1011 | 0 | 2455 | 353 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 134 | 0 | 182 | 0 | 474 | 253 | 0 | 614 | 88 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 536 | 0 | 726 | 0 | 1895 | 1011 | 0 | 2455 | 353 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |

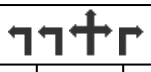
**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.16 | 0.00 | 0.25 | 0.00 | 0.37 | 0.00 | 0.00 | 0.48 | 0.00 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.779 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.831 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1261 | 117 | 552 | 0 | 0 | 371 | 388 | 1727 | 554 | 0 | 1771 | 60 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1261 | 117 | 552 | 0 | 0 | 371 | 388 | 1727 | 554 | 0 | 1771 | 60 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 315 | 29 | 138 | 0 | 0 | 93 | 97 | 432 | 139 | 0 | 443 | 15 |
| Total Analysis Volume [veh/h] | 1261 | 117 | 552 | 0 | 0 | 371 | 388 | 1727 | 554 | 0 | 1771 | 60 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.25 | 0.28 | 0.28 | 0.00 | 0.00 | 0.00 | 0.23 | 0.34 | 0.00 | 0.00 | 0.27 | 0.27 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.831 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.713 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 238 | 181 | 109 | 324 | 233 | 180 | 211 | 1652 | 239 | 144 | 1449 | 205 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 238 | 181 | 109 | 324 | 233 | 180 | 211 | 1652 | 239 | 144 | 1449 | 205 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 60 | 45 | 27 | 81 | 58 | 45 | 53 | 413 | 60 | 36 | 362 | 51 |
| Total Analysis Volume [veh/h] | 238 | 181 | 109 | 324 | 233 | 180 | 211 | 1652 | 239 | 144 | 1449 | 205 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.07 | 0.09 | 0.09 | 0.10 | 0.14 | 0.11 | 0.12 | 0.37 | 0.37 | 0.08 | 0.24 | 0.24 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.713 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.675 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 154 | 17 | 231 | 25 | 11 | 12 | 24 | 1817 | 272 | 200 | 1727 | 45 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 154 | 17 | 231 | 25 | 11 | 12 | 24 | 1817 | 272 | 200 | 1727 | 45 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 39 | 4 | 58 | 6 | 3 | 3 | 6 | 454 | 68 | 50 | 432 | 11 |
| Total Analysis Volume [veh/h] | 154 | 17 | 231 | 25 | 11 | 12 | 24 | 1817 | 272 | 200 | 1727 | 45 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.05 | 0.05 | 0.14 | 0.01 | 0.01 | 0.01 | 0.01 | 0.36 | 0.16 | 0.12 | 0.35 | 0.35 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.675 | | | | | | | | | | | |

*APPENDIX C-II*

# YEAR 2026 TRAFFIC CONDITIONS

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 ICU Network.vistro
Report File: N:\...\AM 2026.pdf

Scenario 4 AM 2026
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | ICU 1 | WB Thru | 0.784 | - | C |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | ICU 1 | WB Thru | 0.810 | - | D |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | ICU 1 | EB Thru | 0.869 | - | D |
| 4 | Randolph Avenue at Birch Street | Signalized | ICU 1 | EB Right | 0.385 | - | A |
| 5 | State College Boulevard at Birch Street | Signalized | ICU 1 | SB Right | 0.609 | - | B |
| 6 | S Associated Road at Birch Street | Signalized | ICU 1 | EB Thru | 0.662 | - | B |
| 7 | Randolph Avenue at Madison Way | Signalized | ICU 1 | NB Right | 0.144 | - | A |
| 8 | Randolph Avenue at Brea Mall | Signalized | ICU 1 | NB Thru | 0.143 | - | A |
| 9 | Brea Mall South at State College Boulevard | Signalized | ICU 1 | WB Thru | 0.204 | - | A |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | ICU 1 | EB Right | 0.840 | - | D |
| 11 | Puente Street at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.651 | - | B |
| 12 | Brea Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.865 | - | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.484 | - | A |
| 14 | State College Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.765 | - | C |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.655 | - | B |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.618 | - | B |
| 17 | Associated Road at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.746 | - | C |
| 18 | Castlegate Lane/Placentia | Signalized | ICU 1 | EB Thru | 0.643 | | B |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.643 | - | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.784 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 173 | 222 | 206 | 926 | 617 | 8 | 15 | 1400 | 212 | 479 | 1794 | 576 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 173 | 222 | 206 | 926 | 617 | 8 | 15 | 1400 | 212 | 479 | 1794 | 576 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 43 | 56 | 52 | 232 | 154 | 2 | 4 | 350 | 53 | 120 | 449 | 144 |
| Total Analysis Volume [veh/h] | 173 | 222 | 206 | 926 | 617 | 8 | 15 | 1400 | 212 | 479 | 1794 | 576 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.05 | 0.08 | 0.08 | 0.27 | 0.18 | 0.18 | 0.00 | 0.24 | 0.24 | 0.14 | 0.35 | 0.07 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.784 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.810 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 1071 | 0 | 708 | 0 | 1902 | 635 | 246 | 2202 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 1071 | 0 | 708 | 0 | 1902 | 635 | 246 | 2202 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 268 | 0 | 177 | 0 | 476 | 159 | 62 | 551 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 1071 | 0 | 708 | 0 | 1902 | 635 | 246 | 2202 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.32 | 0.00 | 0.21 | 0.00 | 0.37 | 0.19 | 0.07 | 0.43 | 0.00 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.810 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.869 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1080 | 0 | 512 | 0 | 0 | 0 | 0 | 2555 | 408 | 0 | 1380 | 498 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1080 | 0 | 512 | 0 | 0 | 0 | 0 | 2555 | 408 | 0 | 1380 | 498 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 270 | 0 | 128 | 0 | 0 | 0 | 0 | 639 | 102 | 0 | 345 | 0 |
| Total Analysis Volume [veh/h] | 1080 | 0 | 512 | 0 | 0 | 0 | 0 | 2555 | 408 | 0 | 1380 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.32 | 0.00 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.50 | 0.24 | 0.00 | 0.27 | 0.00 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.869 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.385 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 25 | 42 | 93 | 38 | 36 | 26 | 41 | 622 | 94 | 80 | 566 | 45 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 25 | 42 | 93 | 38 | 36 | 26 | 41 | 622 | 94 | 80 | 566 | 45 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 6 | 11 | 23 | 10 | 9 | 7 | 10 | 156 | 24 | 20 | 142 | 11 |
| Total Analysis Volume [veh/h] | 25 | 42 | 93 | 38 | 36 | 26 | 41 | 622 | 94 | 80 | 566 | 45 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.01 | 0.02 | 0.05 | 0.02 | 0.04 | 0.04 | 0.02 | 0.21 | 0.21 | 0.05 | 0.17 | 0.03 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.385 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.609 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 80 | 151 | 100 | 696 | 864 | 232 | 115 | 543 | 50 | 81 | 596 | 304 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 80 | 151 | 100 | 696 | 864 | 232 | 115 | 543 | 50 | 81 | 596 | 304 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 20 | 38 | 25 | 174 | 216 | 58 | 29 | 136 | 13 | 20 | 149 | 76 |
| Total Analysis Volume [veh/h] | 80 | 151 | 100 | 696 | 864 | 232 | 115 | 543 | 50 | 81 | 596 | 304 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.04 | 0.06 | 0.20 | 0.32 | 0.32 | 0.03 | 0.16 | 0.03 | 0.02 | 0.18 | 0.18 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.609 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.662 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 255 | 6 | 323 | 57 | 29 | 9 | 5 | 986 | 335 | 357 | 803 | 11 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 255 | 6 | 323 | 57 | 29 | 9 | 5 | 986 | 335 | 357 | 803 | 11 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 64 | 2 | 81 | 14 | 7 | 2 | 1 | 247 | 84 | 89 | 201 | 3 |
| Total Analysis Volume [veh/h] | 255 | 6 | 323 | 57 | 29 | 9 | 5 | 986 | 335 | 357 | 803 | 11 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.08 | 0.00 | 0.09 | 0.03 | 0.02 | 0.02 | 0.00 | 0.39 | 0.39 | 0.11 | 0.24 | 0.24 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.662 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.144 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 26 | 139 | 8 | 6 | 130 | 17 | 35 | 2 | 59 | 0 | 0 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 26 | 139 | 8 | 6 | 130 | 17 | 35 | 2 | 59 | 0 | 0 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 35 | 2 | 2 | 33 | 4 | 9 | 1 | 15 | 0 | 0 | 0 |
| Total Analysis Volume [veh/h] | 26 | 139 | 8 | 6 | 130 | 17 | 35 | 2 | 59 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.04 | 0.04 | 0.00 | 0.04 | 0.04 | 0.02 | 0.04 | 0.04 | 0.00 | 0.00 | 0.00 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.144 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.143 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 14 | 181 | 69 | 16 | 158 | 6 | 1 | 0 | 1 | 27 | 0 | 5 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 14 | 181 | 69 | 16 | 158 | 6 | 1 | 0 | 1 | 27 | 0 | 5 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 45 | 17 | 4 | 40 | 2 | 0 | 0 | 0 | 7 | 0 | 1 |
| Total Analysis Volume [veh/h] | 14 | 181 | 69 | 16 | 158 | 6 | 1 | 0 | 1 | 27 | 0 | 5 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.07 | 0.07 | 0.01 | 0.05 | 0.05 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.143 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.204 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 33 | 9 | 16 | 3 | 6 | 28 | 80 | 270 | 16 | 28 | 381 | 12 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 33 | 9 | 16 | 3 | 6 | 28 | 80 | 270 | 16 | 28 | 381 | 12 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 8 | 2 | 4 | 1 | 2 | 7 | 20 | 68 | 4 | 7 | 95 | 3 |
| Total Analysis Volume [veh/h] | 33 | 9 | 16 | 3 | 6 | 28 | 80 | 270 | 16 | 28 | 381 | 12 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 0.08 | 0.08 | 0.02 | 0.12 | 0.12 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.204 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.840 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 314 | 712 | 279 | 170 | 1318 | 318 | 289 | 1395 | 375 | 313 | 1247 | 262 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 314 | 712 | 279 | 170 | 1318 | 318 | 289 | 1395 | 375 | 313 | 1247 | 262 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 79 | 178 | 70 | 43 | 330 | 80 | 72 | 349 | 94 | 78 | 312 | 66 |
| Total Analysis Volume [veh/h] | 314 | 712 | 279 | 170 | 1318 | 318 | 289 | 1395 | 375 | 313 | 1247 | 262 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.09 | 0.14 | 0.16 | 0.05 | 0.26 | 0.19 | 0.09 | 0.35 | 0.35 | 0.09 | 0.24 | 0.15 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.840 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.651 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 61 | 118 | 158 | 136 | 87 | 148 | 234 | 1447 | 81 | 50 | 1479 | 173 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 61 | 118 | 158 | 136 | 87 | 148 | 234 | 1447 | 81 | 50 | 1479 | 173 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 15 | 30 | 40 | 34 | 22 | 37 | 59 | 362 | 20 | 13 | 370 | 43 |
| Total Analysis Volume [veh/h] | 61 | 118 | 158 | 136 | 87 | 148 | 234 | 1447 | 81 | 50 | 1479 | 173 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.07 | 0.09 | 0.08 | 0.03 | 0.09 | 0.14 | 0.30 | 0.30 | 0.03 | 0.29 | 0.10 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.651 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.865 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 450 | 501 | 158 | 172 | 1032 | 209 | 166 | 1604 | 367 | 167 | 1685 | 116 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 450 | 501 | 158 | 172 | 1032 | 209 | 166 | 1604 | 367 | 167 | 1685 | 116 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 113 | 125 | 40 | 43 | 258 | 52 | 42 | 401 | 92 | 42 | 421 | 29 |
| Total Analysis Volume [veh/h] | 450 | 501 | 158 | 172 | 1032 | 209 | 166 | 1604 | 367 | 167 | 1685 | 116 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.13 | 0.10 | 0.09 | 0.05 | 0.30 | 0.12 | 0.05 | 0.31 | 0.22 | 0.05 | 0.33 | 0.07 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.865 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.484 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 37 | 19 | 68 | 133 | 21 | 32 | 62 | 1683 | 26 | 41 | 1790 | 154 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 37 | 19 | 68 | 133 | 21 | 32 | 62 | 1683 | 26 | 41 | 1790 | 154 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 9 | 5 | 17 | 33 | 5 | 8 | 16 | 421 | 7 | 10 | 448 | 39 |
| Total Analysis Volume [veh/h] | 37 | 19 | 68 | 133 | 21 | 32 | 62 | 1683 | 26 | 41 | 1790 | 154 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

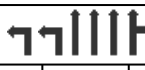
**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.02 | 0.03 | 0.03 | 0.04 | 0.03 | 0.03 | 0.02 | 0.34 | 0.34 | 0.02 | 0.35 | 0.09 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.484 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.765 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 115 | 160 | 429 | 102 | 392 | 28 | 35 | 1684 | 194 | 462 | 1845 | 146 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 115 | 160 | 429 | 102 | 392 | 28 | 35 | 1684 | 194 | 462 | 1845 | 146 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 29 | 40 | 107 | 26 | 98 | 7 | 9 | 421 | 49 | 116 | 461 | 37 |
| Total Analysis Volume [veh/h] | 115 | 160 | 429 | 102 | 392 | 28 | 35 | 1684 | 194 | 462 | 1845 | 146 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.03 | 0.05 | 0.25 | 0.05 | 0.12 | 0.12 | 0.01 | 0.28 | 0.28 | 0.14 | 0.36 | 0.03 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.765 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.655 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 611 | 0 | 512 | 0 | 1539 | 726 | 0 | 1965 | 202 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 611 | 0 | 512 | 0 | 1539 | 726 | 0 | 1965 | 202 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 153 | 0 | 128 | 0 | 385 | 182 | 0 | 491 | 51 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 611 | 0 | 512 | 0 | 1539 | 726 | 0 | 1965 | 202 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |

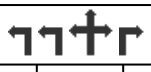
**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.18 | 0.00 | 0.22 | 0.00 | 0.30 | 0.00 | 0.00 | 0.39 | 0.00 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.655 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.618 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1020 | 31 | 850 | 0 | 0 | 86 | 98 | 1432 | 562 | 0 | 1552 | 14 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1020 | 31 | 850 | 0 | 0 | 86 | 98 | 1432 | 562 | 0 | 1552 | 14 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 255 | 8 | 213 | 0 | 0 | 22 | 25 | 358 | 141 | 0 | 388 | 4 |
| Total Analysis Volume [veh/h] | 1020 | 31 | 850 | 0 | 0 | 86 | 98 | 1432 | 562 | 0 | 1552 | 14 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.20 | 0.28 | 0.28 | 0.00 | 0.00 | 0.00 | 0.06 | 0.28 | 0.00 | 0.00 | 0.23 | 0.23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.618 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.746 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 151 | 211 | 73 | 170 | 335 | 166 | 216 | 1936 | 102 | 93 | 1673 | 102 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 151 | 211 | 73 | 170 | 335 | 166 | 216 | 1936 | 102 | 93 | 1673 | 102 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 38 | 53 | 18 | 43 | 84 | 42 | 54 | 484 | 26 | 23 | 418 | 26 |
| Total Analysis Volume [veh/h] | 151 | 211 | 73 | 170 | 335 | 166 | 216 | 1936 | 102 | 93 | 1673 | 102 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.08 | 0.08 | 0.05 | 0.20 | 0.10 | 0.13 | 0.40 | 0.40 | 0.05 | 0.26 | 0.26 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.746 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.643 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 177 | 12 | 149 | 25 | 28 | 15 | 14 | 1914 | 364 | 178 | 1550 | 33 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 177 | 12 | 149 | 25 | 28 | 15 | 14 | 1914 | 364 | 178 | 1550 | 33 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 44 | 3 | 37 | 6 | 7 | 4 | 4 | 479 | 91 | 45 | 388 | 8 |
| Total Analysis Volume [veh/h] | 177 | 12 | 149 | 25 | 28 | 15 | 14 | 1914 | 364 | 178 | 1550 | 33 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.05 | 0.06 | 0.09 | 0.01 | 0.03 | 0.03 | 0.01 | 0.38 | 0.21 | 0.10 | 0.31 | 0.31 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.643 | | | | | | | | | | | |

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 ICU Network.vistro
Report File: N:\...\PM 2026.pdf

Scenario 5 PM 2026
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | ICU 1 | WB Right | 0.787 | - | C |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | ICU 1 | WB Thru | 0.671 | - | B |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | ICU 1 | EB Thru | 0.571 | - | A |
| 4 | Randolph Avenue at Birch Street | Signalized | ICU 1 | WB Thru | 0.611 | - | B |
| 5 | State College Boulevard at Birch Street | Signalized | ICU 1 | WB Right | 0.783 | - | C |
| 6 | S Associated Road at Birch Street | Signalized | ICU 1 | WB Thru | 0.667 | - | B |
| 7 | Randolph Avenue at Madison Way | Signalized | ICU 1 | NB Thru | 0.252 | - | A |
| 8 | Randolph Avenue at Brea Mall | Signalized | ICU 1 | NB Thru | 0.374 | - | A |
| 9 | Brea Mall South at State College Boulevard | Signalized | ICU 1 | EB Thru | 0.470 | - | A |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.870 | - | D |
| 11 | Puente Street at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.650 | - | B |
| 12 | Brea Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.847 | - | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.709 | - | C |
| 14 | State College Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.937 | - | E |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.766 | - | C |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.756 | - | C |
| 17 | Associated Road at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.834 | - | D |
| 18 | Castlegate Lane/Placentia | Signalized | ICU 1 | WB Thru | 0.753 | | C |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.733 | - | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.787 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 326 | 615 | 319 | 587 | 411 | 16 | 40 | 1506 | 269 | 409 | 1200 | 741 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 326 | 615 | 319 | 587 | 411 | 16 | 40 | 1506 | 269 | 409 | 1200 | 741 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 82 | 154 | 80 | 147 | 103 | 4 | 10 | 377 | 67 | 102 | 300 | 185 |
| Total Analysis Volume [veh/h] | 326 | 615 | 319 | 587 | 411 | 16 | 40 | 1506 | 269 | 409 | 1200 | 741 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.10 | 0.18 | 0.18 | 0.17 | 0.13 | 0.13 | 0.01 | 0.26 | 0.26 | 0.12 | 0.24 | 0.26 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.787 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.671 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 470 | 0 | 870 | 0 | 1477 | 857 | 257 | 1789 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 470 | 0 | 870 | 0 | 1477 | 857 | 257 | 1789 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 118 | 0 | 218 | 0 | 369 | 214 | 64 | 447 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 470 | 0 | 870 | 0 | 1477 | 857 | 257 | 1789 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.14 | 0.00 | 0.26 | 0.00 | 0.29 | 0.25 | 0.08 | 0.35 | 0.00 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.671 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.571 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 693 | 0 | 301 | 0 | 0 | 0 | 0 | 1572 | 586 | 0 | 1170 | 539 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 693 | 0 | 301 | 0 | 0 | 0 | 0 | 1572 | 586 | 0 | 1170 | 539 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 173 | 0 | 75 | 0 | 0 | 0 | 0 | 393 | 147 | 0 | 293 | 0 |
| Total Analysis Volume [veh/h] | 693 | 0 | 301 | 0 | 0 | 0 | 0 | 1572 | 586 | 0 | 1170 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.20 | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.32 | 0.32 | 0.00 | 0.23 | 0.00 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.571 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.611 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 136 | 58 | 174 | 52 | 50 | 110 | 80 | 730 | 98 | 196 | 1154 | 40 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 136 | 58 | 174 | 52 | 50 | 110 | 80 | 730 | 98 | 196 | 1154 | 40 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 34 | 15 | 44 | 13 | 13 | 28 | 20 | 183 | 25 | 49 | 289 | 10 |
| Total Analysis Volume [veh/h] | 136 | 58 | 174 | 52 | 50 | 110 | 80 | 730 | 98 | 196 | 1154 | 40 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.08 | 0.03 | 0.10 | 0.03 | 0.09 | 0.09 | 0.05 | 0.24 | 0.24 | 0.12 | 0.34 | 0.02 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.611 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.783 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 148 | 426 | 162 | 351 | 378 | 328 | 293 | 800 | 162 | 147 | 1023 | 673 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 148 | 426 | 162 | 351 | 378 | 328 | 293 | 800 | 162 | 147 | 1023 | 673 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 37 | 107 | 41 | 88 | 95 | 82 | 73 | 200 | 41 | 37 | 256 | 168 |
| Total Analysis Volume [veh/h] | 148 | 426 | 162 | 351 | 378 | 328 | 293 | 800 | 162 | 147 | 1023 | 673 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.13 | 0.10 | 0.10 | 0.21 | 0.21 | 0.09 | 0.24 | 0.10 | 0.04 | 0.30 | 0.40 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.783 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.667 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 500 | 33 | 355 | 11 | 20 | 9 | 16 | 931 | 314 | 295 | 1318 | 18 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 500 | 33 | 355 | 11 | 20 | 9 | 16 | 931 | 314 | 295 | 1318 | 18 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 125 | 8 | 89 | 3 | 5 | 2 | 4 | 233 | 79 | 74 | 330 | 5 |
| Total Analysis Volume [veh/h] | 500 | 33 | 355 | 11 | 20 | 9 | 16 | 931 | 314 | 295 | 1318 | 18 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.15 | 0.02 | 0.12 | 0.01 | 0.02 | 0.02 | 0.01 | 0.37 | 0.37 | 0.09 | 0.39 | 0.39 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.667 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.252 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 48 | 325 | 43 | 28 | 260 | 30 | 65 | 4 | 52 | 75 | 4 | 38 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 48 | 325 | 43 | 28 | 260 | 30 | 65 | 4 | 52 | 75 | 4 | 38 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 12 | 81 | 11 | 7 | 65 | 8 | 16 | 1 | 13 | 19 | 1 | 10 |
| Total Analysis Volume [veh/h] | 48 | 325 | 43 | 28 | 260 | 30 | 65 | 4 | 52 | 75 | 4 | 38 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.03 | 0.11 | 0.11 | 0.02 | 0.09 | 0.09 | 0.04 | 0.03 | 0.03 | 0.04 | 0.02 | 0.02 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.252 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.374 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 17 | 338 | 322 | 37 | 373 | 20 | 18 | 3 | 12 | 274 | 3 | 47 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 17 | 338 | 322 | 37 | 373 | 20 | 18 | 3 | 12 | 274 | 3 | 47 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 85 | 81 | 9 | 93 | 5 | 5 | 1 | 3 | 69 | 1 | 12 |
| Total Analysis Volume [veh/h] | 17 | 338 | 322 | 37 | 373 | 20 | 18 | 3 | 12 | 274 | 3 | 47 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.19 | 0.19 | 0.02 | 0.12 | 0.12 | 0.01 | 0.01 | 0.01 | 0.08 | 0.13 | 0.13 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.374 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.470 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 144 | 25 | 67 | 45 | 19 | 383 | 494 | 568 | 23 | 99 | 467 | 27 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 144 | 25 | 67 | 45 | 19 | 383 | 494 | 568 | 23 | 99 | 467 | 27 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 36 | 6 | 17 | 11 | 5 | 96 | 124 | 142 | 6 | 25 | 117 | 7 |
| Total Analysis Volume [veh/h] | 144 | 25 | 67 | 45 | 19 | 383 | 494 | 568 | 23 | 99 | 467 | 27 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.05 | 0.04 | 0.03 | 0.01 | 0.08 | 0.15 | 0.17 | 0.17 | 0.06 | 0.15 | 0.15 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.470 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.870 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 443 | 1174 | 232 | 274 | 976 | 418 | 320 | 1289 | 298 | 450 | 1606 | 285 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 443 | 1174 | 232 | 274 | 976 | 418 | 320 | 1289 | 298 | 450 | 1606 | 285 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 111 | 294 | 58 | 69 | 244 | 105 | 80 | 322 | 75 | 113 | 402 | 71 |
| Total Analysis Volume [veh/h] | 443 | 1174 | 232 | 274 | 976 | 418 | 320 | 1289 | 298 | 450 | 1606 | 285 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.13 | 0.23 | 0.14 | 0.08 | 0.19 | 0.25 | 0.09 | 0.31 | 0.31 | 0.13 | 0.31 | 0.17 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.870 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.650 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 36 | 49 | 84 | 189 | 108 | 217 | 139 | 1613 | 38 | 107 | 1824 | 279 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 36 | 49 | 84 | 189 | 108 | 217 | 139 | 1613 | 38 | 107 | 1824 | 279 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 9 | 12 | 21 | 47 | 27 | 54 | 35 | 403 | 10 | 27 | 456 | 70 |
| Total Analysis Volume [veh/h] | 36 | 49 | 84 | 189 | 108 | 217 | 139 | 1613 | 38 | 107 | 1824 | 279 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.03 | 0.05 | 0.11 | 0.03 | 0.13 | 0.08 | 0.32 | 0.32 | 0.06 | 0.36 | 0.16 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.650 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.847 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 536 | 890 | 276 | 264 | 696 | 217 | 242 | 1836 | 433 | 253 | 1850 | 197 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 536 | 890 | 276 | 264 | 696 | 217 | 242 | 1836 | 433 | 253 | 1850 | 197 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 134 | 223 | 69 | 66 | 174 | 54 | 61 | 459 | 108 | 63 | 463 | 49 |
| Total Analysis Volume [veh/h] | 536 | 890 | 276 | 264 | 696 | 217 | 242 | 1836 | 433 | 253 | 1850 | 197 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.16 | 0.17 | 0.16 | 0.08 | 0.20 | 0.13 | 0.07 | 0.36 | 0.25 | 0.07 | 0.36 | 0.12 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.847 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.709 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 58 | 39 | 69 | 333 | 30 | 219 | 257 | 1807 | 45 | 73 | 2051 | 339 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 58 | 39 | 69 | 333 | 30 | 219 | 257 | 1807 | 45 | 73 | 2051 | 339 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 15 | 10 | 17 | 83 | 8 | 55 | 64 | 452 | 11 | 18 | 513 | 85 |
| Total Analysis Volume [veh/h] | 58 | 39 | 69 | 333 | 30 | 219 | 257 | 1807 | 45 | 73 | 2051 | 339 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

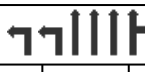
**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.03 | 0.03 | 0.10 | 0.15 | 0.15 | 0.08 | 0.36 | 0.36 | 0.04 | 0.40 | 0.20 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.709 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | E |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.937 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 385 | 598 | 370 | 446 | 315 | 98 | 112 | 1975 | 112 | 474 | 1996 | 501 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 385 | 598 | 370 | 446 | 315 | 98 | 112 | 1975 | 112 | 474 | 1996 | 501 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 96 | 150 | 93 | 112 | 79 | 25 | 28 | 494 | 28 | 119 | 499 | 125 |
| Total Analysis Volume [veh/h] | 385 | 598 | 370 | 446 | 315 | 98 | 112 | 1975 | 112 | 474 | 1996 | 501 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.11 | 0.18 | 0.22 | 0.22 | 0.12 | 0.12 | 0.03 | 0.31 | 0.31 | 0.14 | 0.39 | 0.07 |
| Intersection LOS | E | | | | | | | | | | | |
| Intersection V/C | 0.937 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.766 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 687 | 0 | 558 | 0 | 1779 | 1031 | 0 | 2409 | 417 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 687 | 0 | 558 | 0 | 1779 | 1031 | 0 | 2409 | 417 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 172 | 0 | 140 | 0 | 445 | 258 | 0 | 602 | 104 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 687 | 0 | 558 | 0 | 1779 | 1031 | 0 | 2409 | 417 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |

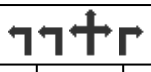
**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.24 | 0.00 | 0.35 | 0.00 | 0.00 | 0.47 | 0.00 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.766 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.756 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1016 | 64 | 453 | 0 | 0 | 192 | 182 | 1920 | 381 | 0 | 2500 | 38 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1016 | 64 | 453 | 0 | 0 | 192 | 182 | 1920 | 381 | 0 | 2500 | 38 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 254 | 16 | 113 | 0 | 0 | 48 | 46 | 480 | 95 | 0 | 625 | 10 |
| Total Analysis Volume [veh/h] | 1016 | 64 | 453 | 0 | 0 | 192 | 182 | 1920 | 381 | 0 | 2500 | 38 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.20 | 0.23 | 0.23 | 0.00 | 0.00 | 0.00 | 0.11 | 0.38 | 0.00 | 0.00 | 0.37 | 0.37 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.756 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.834 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 220 | 262 | 86 | 297 | 353 | 261 | 279 | 1931 | 144 | 178 | 1808 | 191 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 220 | 262 | 86 | 297 | 353 | 261 | 279 | 1931 | 144 | 178 | 1808 | 191 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 55 | 66 | 22 | 74 | 88 | 65 | 70 | 483 | 36 | 45 | 452 | 48 |
| Total Analysis Volume [veh/h] | 220 | 262 | 86 | 297 | 353 | 261 | 279 | 1931 | 144 | 178 | 1808 | 191 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.06 | 0.10 | 0.10 | 0.09 | 0.21 | 0.15 | 0.16 | 0.41 | 0.41 | 0.10 | 0.29 | 0.29 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.834 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.753 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 248 | 48 | 272 | 26 | 23 | 15 | 19 | 1942 | 286 | 237 | 1992 | 58 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 248 | 48 | 272 | 26 | 23 | 15 | 19 | 1942 | 286 | 237 | 1992 | 58 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 62 | 12 | 68 | 7 | 6 | 4 | 5 | 486 | 72 | 59 | 498 | 15 |
| Total Analysis Volume [veh/h] | 248 | 48 | 272 | 26 | 23 | 15 | 19 | 1942 | 286 | 237 | 1992 | 58 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.07 | 0.09 | 0.16 | 0.02 | 0.02 | 0.02 | 0.01 | 0.38 | 0.17 | 0.14 | 0.40 | 0.40 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.753 | | | | | | | | | | | |

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 ICU Network.vistro
Report File: N:\...\Sat 2026.pdf

Scenario 6 Sat MD 2026
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | ICU 1 | WB Thru | 0.781 | - | C |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | ICU 1 | WB Thru | 0.785 | - | C |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | ICU 1 | EB Thru | 0.729 | - | C |
| 4 | Randolph Avenue at Birch Street | Signalized | ICU 1 | WB Thru | 0.529 | - | A |
| 5 | State College Boulevard at Birch Street | Signalized | ICU 1 | SB Thru | 0.729 | - | C |
| 6 | S Associated Road at Birch Street | Signalized | ICU 1 | EB Right | 0.559 | - | A |
| 7 | Randolph Avenue at Madison Way | Signalized | ICU 1 | NB Thru | 0.302 | - | A |
| 8 | Randolph Avenue at Brea Mall | Signalized | ICU 1 | NB Right | 0.493 | - | A |
| 9 | Brea Mall South at State College Boulevard | Signalized | ICU 1 | WB Thru | 0.621 | - | B |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.730 | - | C |
| 11 | Puente Street at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.536 | - | A |
| 12 | Brea Boulevard at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.843 | - | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.857 | - | D |
| 14 | State College Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 1.185 | - | F |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.862 | - | D |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.813 | - | D |
| 17 | Associated Road at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.774 | - | C |
| 18 | Castlegate Lane/Placentia | Signalized | ICU 1 | EB Thru | 0.732 | | C |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.732 | - | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.781 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 139 | 276 | 389 | 547 | 387 | 5 | 19 | 1230 | 276 | 743 | 1631 | 751 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 139 | 276 | 389 | 547 | 387 | 5 | 19 | 1230 | 276 | 743 | 1631 | 751 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 35 | 69 | 97 | 137 | 97 | 1 | 5 | 308 | 69 | 186 | 408 | 188 |
| Total Analysis Volume [veh/h] | 139 | 276 | 389 | 547 | 387 | 5 | 19 | 1230 | 276 | 743 | 1631 | 751 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.04 | 0.13 | 0.13 | 0.16 | 0.12 | 0.12 | 0.01 | 0.22 | 0.22 | 0.22 | 0.32 | 0.28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.781 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.785 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 837 | 0 | 1247 | 0 | 1571 | 580 | 199 | 1876 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 837 | 0 | 1247 | 0 | 1571 | 580 | 199 | 1876 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 209 | 0 | 312 | 0 | 393 | 145 | 50 | 469 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 837 | 0 | 1247 | 0 | 1571 | 580 | 199 | 1876 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 | 0.37 | 0.00 | 0.31 | 0.17 | 0.06 | 0.37 | 0.00 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.785 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.729 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | | | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1104 | 0 | 467 | 0 | 0 | 0 | 0 | 1695 | 716 | 0 | 970 | 425 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1104 | 0 | 467 | 0 | 0 | 0 | 0 | 1695 | 716 | 0 | 970 | 425 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 276 | 0 | 117 | 0 | 0 | 0 | 0 | 424 | 179 | 0 | 243 | 0 |
| Total Analysis Volume [veh/h] | 1104 | 0 | 467 | 0 | 0 | 0 | 0 | 1695 | 716 | 0 | 970 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.32 | 0.00 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 | 0.35 | 0.00 | 0.19 | 0.00 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.729 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.529 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 102 | 77 | 183 | 56 | 38 | 80 | 89 | 701 | 128 | 160 | 849 | 26 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 102 | 77 | 183 | 56 | 38 | 80 | 89 | 701 | 128 | 160 | 849 | 26 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 26 | 19 | 46 | 14 | 10 | 20 | 22 | 175 | 32 | 40 | 212 | 7 |
| Total Analysis Volume [veh/h] | 102 | 77 | 183 | 56 | 38 | 80 | 89 | 701 | 128 | 160 | 849 | 26 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.06 | 0.05 | 0.11 | 0.03 | 0.07 | 0.07 | 0.05 | 0.24 | 0.24 | 0.09 | 0.25 | 0.02 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.529 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.729 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 130 | 324 | 183 | 287 | 614 | 506 | 306 | 783 | 171 | 171 | 752 | 257 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 130 | 324 | 183 | 287 | 614 | 506 | 306 | 783 | 171 | 171 | 752 | 257 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 33 | 81 | 46 | 72 | 154 | 127 | 77 | 196 | 43 | 43 | 188 | 64 |
| Total Analysis Volume [veh/h] | 130 | 324 | 183 | 287 | 614 | 506 | 306 | 783 | 171 | 171 | 752 | 257 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.10 | 0.11 | 0.08 | 0.33 | 0.33 | 0.09 | 0.23 | 0.10 | 0.05 | 0.22 | 0.15 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.729 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.559 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 341 | 20 | 166 | 12 | 22 | 16 | 10 | 814 | 353 | 148 | 806 | 14 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 341 | 20 | 166 | 12 | 22 | 16 | 10 | 814 | 353 | 148 | 806 | 14 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 85 | 5 | 42 | 3 | 6 | 4 | 3 | 204 | 88 | 37 | 202 | 4 |
| Total Analysis Volume [veh/h] | 341 | 20 | 166 | 12 | 22 | 16 | 10 | 814 | 353 | 148 | 806 | 14 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.10 | 0.01 | 0.05 | 0.01 | 0.02 | 0.02 | 0.01 | 0.34 | 0.34 | 0.04 | 0.24 | 0.24 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.559 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.302 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 22 | 291 | 115 | 72 | 276 | 24 | 38 | 11 | 60 | 83 | 4 | 59 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 22 | 291 | 115 | 72 | 276 | 24 | 38 | 11 | 60 | 83 | 4 | 59 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 6 | 73 | 29 | 18 | 69 | 6 | 10 | 3 | 15 | 21 | 1 | 15 |
| Total Analysis Volume [veh/h] | 22 | 291 | 115 | 72 | 276 | 24 | 38 | 11 | 60 | 83 | 4 | 59 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.12 | 0.12 | 0.04 | 0.09 | 0.09 | 0.02 | 0.04 | 0.04 | 0.05 | 0.04 | 0.04 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.302 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.493 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 23 | 352 | 431 | 43 | 320 | 22 | 25 | 15 | 27 | 395 | 6 | 78 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 23 | 352 | 431 | 43 | 320 | 22 | 25 | 15 | 27 | 395 | 6 | 78 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 6 | 88 | 108 | 11 | 80 | 6 | 6 | 4 | 7 | 99 | 2 | 20 |
| Total Analysis Volume [veh/h] | 23 | 352 | 431 | 43 | 320 | 22 | 25 | 15 | 27 | 395 | 6 | 78 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.23 | 0.23 | 0.03 | 0.10 | 0.10 | 0.01 | 0.02 | 0.02 | 0.12 | 0.19 | 0.19 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.493 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.621 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 175 | 32 | 94 | 62 | 28 | 529 | 677 | 407 | 30 | 89 | 642 | 36 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 175 | 32 | 94 | 62 | 28 | 529 | 677 | 407 | 30 | 89 | 642 | 36 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 44 | 8 | 24 | 16 | 7 | 132 | 169 | 102 | 8 | 22 | 161 | 9 |
| Total Analysis Volume [veh/h] | 175 | 32 | 94 | 62 | 28 | 529 | 677 | 407 | 30 | 89 | 642 | 36 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.05 | 0.06 | 0.06 | 0.04 | 0.02 | 0.11 | 0.20 | 0.13 | 0.13 | 0.05 | 0.20 | 0.20 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.621 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.730 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 357 | 800 | 192 | 234 | 827 | 303 | 353 | 1216 | 283 | 350 | 1314 | 220 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 357 | 800 | 192 | 234 | 827 | 303 | 353 | 1216 | 283 | 350 | 1314 | 220 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 89 | 200 | 48 | 59 | 207 | 76 | 88 | 304 | 71 | 88 | 329 | 55 |
| Total Analysis Volume [veh/h] | 357 | 800 | 192 | 234 | 827 | 303 | 353 | 1216 | 283 | 350 | 1314 | 220 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.11 | 0.16 | 0.11 | 0.07 | 0.16 | 0.18 | 0.10 | 0.29 | 0.29 | 0.10 | 0.26 | 0.13 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.730 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.536 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 27 | 31 | 97 | 164 | 44 | 128 | 82 | 1392 | 37 | 80 | 1451 | 189 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 27 | 31 | 97 | 164 | 44 | 128 | 82 | 1392 | 37 | 80 | 1451 | 189 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 8 | 24 | 41 | 11 | 32 | 21 | 348 | 9 | 20 | 363 | 47 |
| Total Analysis Volume [veh/h] | 27 | 31 | 97 | 164 | 44 | 128 | 82 | 1392 | 37 | 80 | 1451 | 189 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.02 | 0.06 | 0.10 | 0.01 | 0.08 | 0.05 | 0.28 | 0.28 | 0.05 | 0.28 | 0.11 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.536 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.843 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 437 | 574 | 287 | 467 | 933 | 253 | 274 | 1440 | 288 | 367 | 1400 | 414 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 437 | 574 | 287 | 467 | 933 | 253 | 274 | 1440 | 288 | 367 | 1400 | 414 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 109 | 144 | 72 | 117 | 233 | 63 | 69 | 360 | 72 | 92 | 350 | 104 |
| Total Analysis Volume [veh/h] | 437 | 574 | 287 | 467 | 933 | 253 | 274 | 1440 | 288 | 367 | 1400 | 414 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.13 | 0.11 | 0.17 | 0.14 | 0.27 | 0.15 | 0.08 | 0.28 | 0.17 | 0.11 | 0.27 | 0.24 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.843 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.857 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 102 | 47 | 199 | 420 | 86 | 299 | 322 | 1626 | 65 | 142 | 1880 | 473 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 102 | 47 | 199 | 420 | 86 | 299 | 322 | 1626 | 65 | 142 | 1880 | 473 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 26 | 12 | 50 | 105 | 22 | 75 | 81 | 407 | 16 | 36 | 470 | 118 |
| Total Analysis Volume [veh/h] | 102 | 47 | 199 | 420 | 86 | 299 | 322 | 1626 | 65 | 142 | 1880 | 473 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

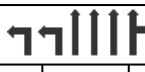
**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.06 | 0.07 | 0.07 | 0.12 | 0.23 | 0.23 | 0.09 | 0.33 | 0.33 | 0.08 | 0.37 | 0.28 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.857 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | F |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.185 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 326 | 554 | 607 | 595 | 421 | 186 | 139 | 1674 | 228 | 684 | 2074 | 973 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 326 | 554 | 607 | 595 | 421 | 186 | 139 | 1674 | 228 | 684 | 2074 | 973 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 82 | 139 | 152 | 149 | 105 | 47 | 35 | 419 | 57 | 171 | 519 | 243 |
| Total Analysis Volume [veh/h] | 326 | 554 | 607 | 595 | 421 | 186 | 139 | 1674 | 228 | 684 | 2074 | 973 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.10 | 0.16 | 0.36 | 0.30 | 0.18 | 0.18 | 0.04 | 0.28 | 0.28 | 0.20 | 0.41 | 0.27 |
| Intersection LOS | F | | | | | | | | | | | |
| Intersection V/C | 1.185 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.862 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 555 | 0 | 777 | 0 | 2000 | 1183 | 0 | 2807 | 349 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 555 | 0 | 777 | 0 | 2000 | 1183 | 0 | 2807 | 349 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 139 | 0 | 194 | 0 | 500 | 296 | 0 | 702 | 87 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 555 | 0 | 777 | 0 | 2000 | 1183 | 0 | 2807 | 349 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |

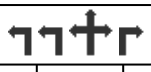
**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.16 | 0.00 | 0.26 | 0.00 | 0.39 | 0.00 | 0.00 | 0.55 | 0.00 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.862 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.813 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1493 | 73 | 606 | 0 | 0 | 257 | 236 | 1976 | 591 | 0 | 2033 | 36 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1493 | 73 | 606 | 0 | 0 | 257 | 236 | 1976 | 591 | 0 | 2033 | 36 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 373 | 18 | 152 | 0 | 0 | 64 | 59 | 494 | 148 | 0 | 508 | 9 |
| Total Analysis Volume [veh/h] | 1493 | 73 | 606 | 0 | 0 | 257 | 236 | 1976 | 591 | 0 | 2033 | 36 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.29 | 0.32 | 0.32 | 0.00 | 0.00 | 0.00 | 0.14 | 0.39 | 0.00 | 0.00 | 0.30 | 0.30 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.813 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.774 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 248 | 186 | 115 | 313 | 238 | 193 | 241 | 1897 | 252 | 152 | 1673 | 217 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 248 | 186 | 115 | 313 | 238 | 193 | 241 | 1897 | 252 | 152 | 1673 | 217 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 62 | 47 | 29 | 78 | 60 | 48 | 60 | 474 | 63 | 38 | 418 | 54 |
| Total Analysis Volume [veh/h] | 248 | 186 | 115 | 313 | 238 | 193 | 241 | 1897 | 252 | 152 | 1673 | 217 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.07 | 0.09 | 0.09 | 0.09 | 0.14 | 0.11 | 0.14 | 0.42 | 0.42 | 0.09 | 0.28 | 0.28 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.774 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.732 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 179 | 18 | 244 | 27 | 11 | 12 | 25 | 2031 | 299 | 212 | 1951 | 48 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 179 | 18 | 244 | 27 | 11 | 12 | 25 | 2031 | 299 | 212 | 1951 | 48 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 45 | 5 | 61 | 7 | 3 | 3 | 6 | 508 | 75 | 53 | 488 | 12 |
| Total Analysis Volume [veh/h] | 179 | 18 | 244 | 27 | 11 | 12 | 25 | 2031 | 299 | 212 | 1951 | 48 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.05 | 0.06 | 0.14 | 0.02 | 0.01 | 0.01 | 0.01 | 0.40 | 0.18 | 0.12 | 0.39 | 0.39 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.732 | | | | | | | | | | | |

*APPENDIX C-III*

# YEAR 2026 PLUS PROJECT TRAFFIC CONDITIONS

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 ICU Network.vistro
Report File: N:\...\AM 2026+P.pdf

Scenario 7 AM 2026+P
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | ICU 1 | WB Thru | 0.788 | - | C |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | ICU 1 | WB Thru | 0.812 | - | D |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | ICU 1 | EB Thru | 0.869 | - | D |
| 4 | Randolph Avenue at Birch Street | Signalized | ICU 1 | EB Thru | 0.390 | - | A |
| 5 | State College Boulevard at Birch Street | Signalized | ICU 1 | SB Thru | 0.611 | - | B |
| 6 | S Associated Road at Birch Street | Signalized | ICU 1 | EB Right | 0.664 | - | B |
| 7 | Randolph Avenue at Madison Way | Signalized | ICU 1 | NB Right | 0.148 | - | A |
| 8 | Randolph Avenue at Brea Mall | Signalized | ICU 1 | NB Right | 0.198 | - | A |
| 9 | Brea Mall South at State College Boulevard | Signalized | ICU 1 | WB Right | 0.236 | - | A |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.842 | - | D |
| 11 | Puente Street at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.659 | - | B |
| 12 | Brea Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.870 | - | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.512 | - | A |
| 14 | State College Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.785 | - | C |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.668 | - | B |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.627 | - | B |
| 17 | Associated Road at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.753 | - | C |
| 18 | Castlegate Lane/Placentia | Signalized | ICU 1 | EB Thru | 0.646 | | B |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.640 | - | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.788 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 173 | 225 | 213 | 926 | 620 | 8 | 15 | 1400 | 212 | 486 | 1794 | 576 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 173 | 225 | 213 | 926 | 620 | 8 | 15 | 1400 | 212 | 486 | 1794 | 576 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 43 | 56 | 53 | 232 | 155 | 2 | 4 | 350 | 53 | 122 | 449 | 144 |
| Total Analysis Volume [veh/h] | 173 | 225 | 213 | 926 | 620 | 8 | 15 | 1400 | 212 | 486 | 1794 | 576 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.05 | 0.09 | 0.09 | 0.27 | 0.18 | 0.18 | 0.00 | 0.24 | 0.24 | 0.14 | 0.35 | 0.07 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.788 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.812 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 1071 | 0 | 713 | 0 | 1909 | 635 | 246 | 2204 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 1071 | 0 | 713 | 0 | 1909 | 635 | 246 | 2204 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 268 | 0 | 178 | 0 | 477 | 159 | 62 | 551 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 1071 | 0 | 713 | 0 | 1909 | 635 | 246 | 2204 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.32 | 0.00 | 0.21 | 0.00 | 0.37 | 0.19 | 0.07 | 0.43 | 0.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.812 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.869 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1080 | 0 | 512 | 0 | 0 | 0 | 0 | 2557 | 413 | 0 | 1382 | 498 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1080 | 0 | 512 | 0 | 0 | 0 | 0 | 2557 | 413 | 0 | 1382 | 498 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 270 | 0 | 128 | 0 | 0 | 0 | 0 | 639 | 103 | 0 | 346 | 0 |
| Total Analysis Volume [veh/h] | 1080 | 0 | 512 | 0 | 0 | 0 | 0 | 2557 | 413 | 0 | 1382 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.32 | 0.00 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.50 | 0.24 | 0.00 | 0.27 | 0.00 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.869 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.390 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 35 | 44 | 96 | 38 | 37 | 26 | 41 | 622 | 103 | 81 | 566 | 45 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 35 | 44 | 96 | 38 | 37 | 26 | 41 | 622 | 103 | 81 | 566 | 45 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 9 | 11 | 24 | 10 | 9 | 7 | 10 | 156 | 26 | 20 | 142 | 11 |
| Total Analysis Volume [veh/h] | 35 | 44 | 96 | 38 | 37 | 26 | 41 | 622 | 103 | 81 | 566 | 45 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.02 | 0.03 | 0.06 | 0.02 | 0.04 | 0.04 | 0.02 | 0.21 | 0.21 | 0.05 | 0.17 | 0.03 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.390 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.611 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 80 | 161 | 104 | 696 | 874 | 232 | 115 | 546 | 50 | 84 | 597 | 304 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 80 | 161 | 104 | 696 | 874 | 232 | 115 | 546 | 50 | 84 | 597 | 304 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 20 | 40 | 26 | 174 | 219 | 58 | 29 | 137 | 13 | 21 | 149 | 76 |
| Total Analysis Volume [veh/h] | 80 | 161 | 104 | 696 | 874 | 232 | 115 | 546 | 50 | 84 | 597 | 304 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.05 | 0.06 | 0.20 | 0.33 | 0.33 | 0.03 | 0.16 | 0.03 | 0.02 | 0.18 | 0.18 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.611 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.664 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 255 | 6 | 323 | 57 | 29 | 9 | 5 | 993 | 335 | 357 | 807 | 11 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 255 | 6 | 323 | 57 | 29 | 9 | 5 | 993 | 335 | 357 | 807 | 11 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 64 | 2 | 81 | 14 | 7 | 2 | 1 | 248 | 84 | 89 | 202 | 3 |
| Total Analysis Volume [veh/h] | 255 | 6 | 323 | 57 | 29 | 9 | 5 | 993 | 335 | 357 | 807 | 11 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.08 | 0.00 | 0.09 | 0.03 | 0.02 | 0.02 | 0.00 | 0.39 | 0.39 | 0.11 | 0.24 | 0.24 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.664 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.148 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 26 | 154 | 8 | 6 | 141 | 17 | 35 | 2 | 59 | 0 | 0 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 26 | 154 | 8 | 6 | 141 | 17 | 35 | 2 | 59 | 0 | 0 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 39 | 2 | 2 | 35 | 4 | 9 | 1 | 15 | 0 | 0 | 0 |
| Total Analysis Volume [veh/h] | 26 | 154 | 8 | 6 | 141 | 17 | 35 | 2 | 59 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.05 | 0.05 | 0.00 | 0.05 | 0.05 | 0.02 | 0.04 | 0.04 | 0.00 | 0.00 | 0.00 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.148 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.198 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 14 | 181 | 129 | 27 | 158 | 6 | 1 | 0 | 1 | 116 | 0 | 20 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 14 | 181 | 129 | 27 | 158 | 6 | 1 | 0 | 1 | 116 | 0 | 20 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 45 | 32 | 7 | 40 | 2 | 0 | 0 | 0 | 29 | 0 | 5 |
| Total Analysis Volume [veh/h] | 14 | 181 | 129 | 27 | 158 | 6 | 1 | 0 | 1 | 116 | 0 | 20 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.09 | 0.09 | 0.02 | 0.05 | 0.05 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.05 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.198 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.236 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 33 | 9 | 16 | 17 | 6 | 67 | 149 | 269 | 16 | 28 | 381 | 26 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 33 | 9 | 16 | 17 | 6 | 67 | 149 | 269 | 16 | 28 | 381 | 26 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 8 | 2 | 4 | 4 | 2 | 17 | 37 | 67 | 4 | 7 | 95 | 7 |
| Total Analysis Volume [veh/h] | 33 | 9 | 16 | 17 | 6 | 67 | 149 | 269 | 16 | 28 | 381 | 26 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.04 | 0.08 | 0.08 | 0.02 | 0.12 | 0.12 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.236 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.842 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 314 | 712 | 279 | 175 | 1318 | 318 | 289 | 1408 | 375 | 313 | 1259 | 266 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 314 | 712 | 279 | 175 | 1318 | 318 | 289 | 1408 | 375 | 313 | 1259 | 266 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 79 | 178 | 70 | 44 | 330 | 80 | 72 | 352 | 94 | 78 | 315 | 67 |
| Total Analysis Volume [veh/h] | 314 | 712 | 279 | 175 | 1318 | 318 | 289 | 1408 | 375 | 313 | 1259 | 266 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.09 | 0.14 | 0.16 | 0.05 | 0.26 | 0.19 | 0.09 | 0.35 | 0.35 | 0.09 | 0.25 | 0.16 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.842 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.659 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 61 | 118 | 161 | 141 | 87 | 148 | 234 | 1465 | 81 | 53 | 1497 | 175 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 61 | 118 | 161 | 141 | 87 | 148 | 234 | 1465 | 81 | 53 | 1497 | 175 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 15 | 30 | 40 | 35 | 22 | 37 | 59 | 366 | 20 | 13 | 374 | 44 |
| Total Analysis Volume [veh/h] | 61 | 118 | 161 | 141 | 87 | 148 | 234 | 1465 | 81 | 53 | 1497 | 175 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.07 | 0.09 | 0.08 | 0.03 | 0.09 | 0.14 | 0.30 | 0.30 | 0.03 | 0.29 | 0.10 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.659 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.870 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 450 | 501 | 172 | 172 | 1032 | 209 | 166 | 1630 | 367 | 180 | 1708 | 116 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 450 | 501 | 172 | 172 | 1032 | 209 | 166 | 1630 | 367 | 180 | 1708 | 116 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 113 | 125 | 43 | 43 | 258 | 52 | 42 | 408 | 92 | 45 | 427 | 29 |
| Total Analysis Volume [veh/h] | 450 | 501 | 172 | 172 | 1032 | 209 | 166 | 1630 | 367 | 180 | 1708 | 116 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.13 | 0.10 | 0.10 | 0.05 | 0.30 | 0.12 | 0.05 | 0.32 | 0.22 | 0.05 | 0.33 | 0.07 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.870 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.512 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 37 | 19 | 68 | 185 | 21 | 69 | 104 | 1683 | 26 | 41 | 1790 | 172 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 37 | 19 | 68 | 185 | 21 | 69 | 104 | 1683 | 26 | 41 | 1790 | 172 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 9 | 5 | 17 | 46 | 5 | 17 | 26 | 421 | 7 | 10 | 448 | 43 |
| Total Analysis Volume [veh/h] | 37 | 19 | 68 | 185 | 21 | 69 | 104 | 1683 | 26 | 41 | 1790 | 172 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.02 | 0.03 | 0.03 | 0.05 | 0.05 | 0.05 | 0.03 | 0.34 | 0.34 | 0.02 | 0.35 | 0.10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.512 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.785 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 119 | 178 | 429 | 126 | 407 | 28 | 35 | 1725 | 204 | 462 | 1859 | 196 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 119 | 178 | 429 | 126 | 407 | 28 | 35 | 1725 | 204 | 462 | 1859 | 196 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 30 | 45 | 107 | 32 | 102 | 7 | 9 | 431 | 51 | 116 | 465 | 49 |
| Total Analysis Volume [veh/h] | 119 | 178 | 429 | 126 | 407 | 28 | 35 | 1725 | 204 | 462 | 1859 | 196 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.05 | 0.25 | 0.06 | 0.13 | 0.13 | 0.01 | 0.28 | 0.28 | 0.14 | 0.36 | 0.05 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.785 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.668 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 611 | 0 | 521 | 0 | 1581 | 749 | 0 | 2020 | 202 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 611 | 0 | 521 | 0 | 1581 | 749 | 0 | 2020 | 202 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 153 | 0 | 130 | 0 | 395 | 187 | 0 | 505 | 51 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 611 | 0 | 521 | 0 | 1581 | 749 | 0 | 2020 | 202 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.18 | 0.00 | 0.22 | 0.00 | 0.31 | 0.00 | 0.00 | 0.40 | 0.00 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.668 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.627 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1044 | 31 | 850 | 0 | 0 | 87 | 100 | 1463 | 570 | 0 | 1583 | 14 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1044 | 31 | 850 | 0 | 0 | 87 | 100 | 1463 | 570 | 0 | 1583 | 14 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 261 | 8 | 213 | 0 | 0 | 22 | 25 | 366 | 143 | 0 | 396 | 4 |
| Total Analysis Volume [veh/h] | 1044 | 31 | 850 | 0 | 0 | 87 | 100 | 1463 | 570 | 0 | 1583 | 14 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.20 | 0.28 | 0.28 | 0.00 | 0.00 | 0.00 | 0.06 | 0.29 | 0.00 | 0.00 | 0.23 | 0.23 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.627 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.753 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 154 | 211 | 73 | 170 | 335 | 168 | 217 | 1962 | 106 | 93 | 1698 | 102 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 154 | 211 | 73 | 170 | 335 | 168 | 217 | 1962 | 106 | 93 | 1698 | 102 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 39 | 53 | 18 | 43 | 84 | 42 | 54 | 491 | 27 | 23 | 425 | 26 |
| Total Analysis Volume [veh/h] | 154 | 211 | 73 | 170 | 335 | 168 | 217 | 1962 | 106 | 93 | 1698 | 102 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.05 | 0.08 | 0.08 | 0.05 | 0.20 | 0.10 | 0.13 | 0.41 | 0.41 | 0.05 | 0.26 | 0.26 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.753 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.646 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 187 | 12 | 149 | 25 | 28 | 15 | 14 | 1931 | 373 | 178 | 1565 | 33 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 187 | 12 | 149 | 25 | 28 | 15 | 14 | 1931 | 373 | 178 | 1565 | 33 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 47 | 3 | 37 | 6 | 7 | 4 | 4 | 483 | 93 | 45 | 391 | 8 |
| Total Analysis Volume [veh/h] | 187 | 12 | 149 | 25 | 28 | 15 | 14 | 1931 | 373 | 178 | 1565 | 33 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.06 | 0.06 | 0.09 | 0.01 | 0.03 | 0.03 | 0.01 | 0.38 | 0.22 | 0.10 | 0.31 | 0.31 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.646 | | | | | | | | | | | |

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 ICU Network.vistro
Report File: N:\...\PM 2026+P.pdf

Scenario 8 PM 2026+P
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | ICU 1 | WB Right | 0.792 | - | C |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | ICU 1 | WB Thru | 0.674 | - | B |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | ICU 1 | EB Thru | 0.572 | - | A |
| 4 | Randolph Avenue at Birch Street | Signalized | ICU 1 | WB Thru | 0.614 | - | B |
| 5 | State College Boulevard at Birch Street | Signalized | ICU 1 | WB Right | 0.788 | - | C |
| 6 | S Associated Road at Birch Street | Signalized | ICU 1 | WB Right | 0.668 | - | B |
| 7 | Randolph Avenue at Madison Way | Signalized | ICU 1 | NB Thru | 0.254 | - | A |
| 8 | Randolph Avenue at Brea Mall | Signalized | ICU 1 | NB Right | 0.447 | - | A |
| 9 | Brea Mall South at State College Boulevard | Signalized | ICU 1 | EB Left | 0.492 | - | A |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.874 | - | D |
| 11 | Puente Street at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.658 | - | B |
| 12 | Brea Boulevard at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.856 | - | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.739 | - | C |
| 14 | State College Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.948 | - | E |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.785 | - | C |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.768 | - | C |
| 17 | Associated Road at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.838 | - | D |
| 18 | Castlegate Lane/Placentia | Signalized | ICU 1 | WB Thru | 0.754 | | C |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.734 | - | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.792 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 326 | 617 | 323 | 587 | 415 | 16 | 40 | 1506 | 269 | 420 | 1200 | 741 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 326 | 617 | 323 | 587 | 415 | 16 | 40 | 1506 | 269 | 420 | 1200 | 741 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 82 | 154 | 81 | 147 | 104 | 4 | 10 | 377 | 67 | 105 | 300 | 185 |
| Total Analysis Volume [veh/h] | 326 | 617 | 323 | 587 | 415 | 16 | 40 | 1506 | 269 | 420 | 1200 | 741 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.10 | 0.18 | 0.18 | 0.17 | 0.13 | 0.13 | 0.01 | 0.26 | 0.26 | 0.12 | 0.24 | 0.26 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.792 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.674 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 470 | 0 | 877 | 0 | 1481 | 857 | 257 | 1793 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 470 | 0 | 877 | 0 | 1481 | 857 | 257 | 1793 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 118 | 0 | 219 | 0 | 370 | 214 | 64 | 448 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 470 | 0 | 877 | 0 | 1481 | 857 | 257 | 1793 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.14 | 0.00 | 0.26 | 0.00 | 0.29 | 0.25 | 0.08 | 0.35 | 0.00 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.674 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.572 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 693 | 0 | 301 | 0 | 0 | 0 | 0 | 1573 | 588 | 0 | 1174 | 539 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 693 | 0 | 301 | 0 | 0 | 0 | 0 | 1573 | 588 | 0 | 1174 | 539 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 173 | 0 | 75 | 0 | 0 | 0 | 0 | 393 | 147 | 0 | 294 | 0 |
| Total Analysis Volume [veh/h] | 693 | 0 | 301 | 0 | 0 | 0 | 0 | 1573 | 588 | 0 | 1174 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.20 | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.32 | 0.32 | 0.00 | 0.23 | 0.00 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.572 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.614 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 141 | 59 | 175 | 52 | 51 | 110 | 80 | 730 | 112 | 198 | 1154 | 40 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 141 | 59 | 175 | 52 | 51 | 110 | 80 | 730 | 112 | 198 | 1154 | 40 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 35 | 15 | 44 | 13 | 13 | 28 | 20 | 183 | 28 | 50 | 289 | 10 |
| Total Analysis Volume [veh/h] | 141 | 59 | 175 | 52 | 51 | 110 | 80 | 730 | 112 | 198 | 1154 | 40 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.08 | 0.03 | 0.10 | 0.03 | 0.09 | 0.09 | 0.05 | 0.25 | 0.25 | 0.12 | 0.34 | 0.02 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.614 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.788 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 148 | 431 | 164 | 351 | 393 | 328 | 293 | 801 | 162 | 152 | 1025 | 673 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 148 | 431 | 164 | 351 | 393 | 328 | 293 | 801 | 162 | 152 | 1025 | 673 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 37 | 108 | 41 | 88 | 98 | 82 | 73 | 200 | 41 | 38 | 256 | 168 |
| Total Analysis Volume [veh/h] | 148 | 431 | 164 | 351 | 393 | 328 | 293 | 801 | 162 | 152 | 1025 | 673 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.13 | 0.10 | 0.10 | 0.21 | 0.21 | 0.09 | 0.24 | 0.10 | 0.04 | 0.30 | 0.40 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.788 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.668 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 500 | 33 | 355 | 11 | 20 | 9 | 16 | 934 | 314 | 295 | 1324 | 18 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 500 | 33 | 355 | 11 | 20 | 9 | 16 | 934 | 314 | 295 | 1324 | 18 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 125 | 8 | 89 | 3 | 5 | 2 | 4 | 234 | 79 | 74 | 331 | 5 |
| Total Analysis Volume [veh/h] | 500 | 33 | 355 | 11 | 20 | 9 | 16 | 934 | 314 | 295 | 1324 | 18 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.15 | 0.02 | 0.12 | 0.01 | 0.02 | 0.02 | 0.01 | 0.37 | 0.37 | 0.09 | 0.39 | 0.39 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.668 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.254 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 48 | 332 | 43 | 28 | 277 | 30 | 65 | 4 | 52 | 75 | 4 | 38 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 48 | 332 | 43 | 28 | 277 | 30 | 65 | 4 | 52 | 75 | 4 | 38 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 12 | 83 | 11 | 7 | 69 | 8 | 16 | 1 | 13 | 19 | 1 | 10 |
| Total Analysis Volume [veh/h] | 48 | 332 | 43 | 28 | 277 | 30 | 65 | 4 | 52 | 75 | 4 | 38 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.03 | 0.11 | 0.11 | 0.02 | 0.09 | 0.09 | 0.04 | 0.03 | 0.03 | 0.04 | 0.02 | 0.02 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.254 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.447 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 17 | 338 | 414 | 54 | 373 | 20 | 18 | 3 | 12 | 314 | 3 | 56 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 17 | 338 | 414 | 54 | 373 | 20 | 18 | 3 | 12 | 314 | 3 | 56 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 85 | 104 | 14 | 93 | 5 | 5 | 1 | 3 | 79 | 1 | 14 |
| Total Analysis Volume [veh/h] | 17 | 338 | 414 | 54 | 373 | 20 | 18 | 3 | 12 | 314 | 3 | 56 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.22 | 0.22 | 0.03 | 0.12 | 0.12 | 0.01 | 0.01 | 0.01 | 0.09 | 0.15 | 0.15 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.447 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.492 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 144 | 25 | 67 | 56 | 19 | 409 | 595 | 567 | 23 | 99 | 467 | 48 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 144 | 25 | 67 | 56 | 19 | 409 | 595 | 567 | 23 | 99 | 467 | 48 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 36 | 6 | 17 | 14 | 5 | 102 | 149 | 142 | 6 | 25 | 117 | 12 |
| Total Analysis Volume [veh/h] | 144 | 25 | 67 | 56 | 19 | 409 | 595 | 567 | 23 | 99 | 467 | 48 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.05 | 0.04 | 0.03 | 0.01 | 0.07 | 0.18 | 0.17 | 0.17 | 0.06 | 0.15 | 0.15 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.492 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.874 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 443 | 1174 | 232 | 280 | 976 | 418 | 320 | 1309 | 298 | 450 | 1613 | 287 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 443 | 1174 | 232 | 280 | 976 | 418 | 320 | 1309 | 298 | 450 | 1613 | 287 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 111 | 294 | 58 | 70 | 244 | 105 | 80 | 327 | 75 | 113 | 403 | 72 |
| Total Analysis Volume [veh/h] | 443 | 1174 | 232 | 280 | 976 | 418 | 320 | 1309 | 298 | 450 | 1613 | 287 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.13 | 0.23 | 0.14 | 0.08 | 0.19 | 0.25 | 0.09 | 0.32 | 0.32 | 0.13 | 0.32 | 0.17 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.874 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.658 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 36 | 49 | 88 | 196 | 108 | 217 | 139 | 1640 | 38 | 109 | 1833 | 281 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 36 | 49 | 88 | 196 | 108 | 217 | 139 | 1640 | 38 | 109 | 1833 | 281 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 9 | 12 | 22 | 49 | 27 | 54 | 35 | 410 | 10 | 27 | 458 | 70 |
| Total Analysis Volume [veh/h] | 36 | 49 | 88 | 196 | 108 | 217 | 139 | 1640 | 38 | 109 | 1833 | 281 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.03 | 0.05 | 0.12 | 0.03 | 0.13 | 0.08 | 0.33 | 0.33 | 0.06 | 0.36 | 0.17 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.658 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.856 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 536 | 890 | 297 | 264 | 696 | 217 | 242 | 1874 | 433 | 260 | 1862 | 197 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 536 | 890 | 297 | 264 | 696 | 217 | 242 | 1874 | 433 | 260 | 1862 | 197 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 134 | 223 | 74 | 66 | 174 | 54 | 61 | 469 | 108 | 65 | 466 | 49 |
| Total Analysis Volume [veh/h] | 536 | 890 | 297 | 264 | 696 | 217 | 242 | 1874 | 433 | 260 | 1862 | 197 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.16 | 0.17 | 0.17 | 0.08 | 0.20 | 0.13 | 0.07 | 0.37 | 0.25 | 0.08 | 0.37 | 0.12 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.856 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.739 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 58 | 39 | 69 | 352 | 30 | 239 | 320 | 1807 | 45 | 73 | 2051 | 368 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 58 | 39 | 69 | 352 | 30 | 239 | 320 | 1807 | 45 | 73 | 2051 | 368 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 15 | 10 | 17 | 88 | 8 | 60 | 80 | 452 | 11 | 18 | 513 | 92 |
| Total Analysis Volume [veh/h] | 58 | 39 | 69 | 352 | 30 | 239 | 320 | 1807 | 45 | 73 | 2051 | 368 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

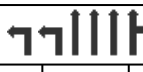
**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.02 | 0.03 | 0.03 | 0.10 | 0.16 | 0.16 | 0.09 | 0.36 | 0.36 | 0.04 | 0.40 | 0.22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.739 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | E |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.948 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 391 | 625 | 370 | 463 | 323 | 98 | 112 | 1991 | 116 | 474 | 2019 | 574 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 391 | 625 | 370 | 463 | 323 | 98 | 112 | 1991 | 116 | 474 | 2019 | 574 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 98 | 156 | 93 | 116 | 81 | 25 | 28 | 498 | 29 | 119 | 505 | 144 |
| Total Analysis Volume [veh/h] | 391 | 625 | 370 | 463 | 323 | 98 | 112 | 1991 | 116 | 474 | 2019 | 574 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.12 | 0.18 | 0.22 | 0.23 | 0.12 | 0.12 | 0.03 | 0.31 | 0.31 | 0.14 | 0.40 | 0.11 |
| Intersection LOS | E | | | | | | | | | | | |
| Intersection V/C | 0.948 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.785 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 687 | 0 | 571 | 0 | 1800 | 1043 | 0 | 2492 | 417 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 687 | 0 | 571 | 0 | 1800 | 1043 | 0 | 2492 | 417 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 172 | 0 | 143 | 0 | 450 | 261 | 0 | 623 | 104 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 687 | 0 | 571 | 0 | 1800 | 1043 | 0 | 2492 | 417 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.25 | 0.00 | 0.35 | 0.00 | 0.00 | 0.49 | 0.00 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.785 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.768 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1052 | 64 | 453 | 0 | 0 | 193 | 183 | 1936 | 385 | 0 | 2546 | 38 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1052 | 64 | 453 | 0 | 0 | 193 | 183 | 1936 | 385 | 0 | 2546 | 38 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 263 | 16 | 113 | 0 | 0 | 48 | 46 | 484 | 96 | 0 | 637 | 10 |
| Total Analysis Volume [veh/h] | 1052 | 64 | 453 | 0 | 0 | 193 | 183 | 1936 | 385 | 0 | 2546 | 38 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.21 | 0.23 | 0.23 | 0.00 | 0.00 | 0.00 | 0.11 | 0.38 | 0.00 | 0.00 | 0.38 | 0.38 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.768 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.838 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 225 | 262 | 86 | 297 | 353 | 264 | 280 | 1944 | 146 | 178 | 1846 | 191 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 225 | 262 | 86 | 297 | 353 | 264 | 280 | 1944 | 146 | 178 | 1846 | 191 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 56 | 66 | 22 | 74 | 88 | 66 | 70 | 486 | 37 | 45 | 462 | 48 |
| Total Analysis Volume [veh/h] | 225 | 262 | 86 | 297 | 353 | 264 | 280 | 1944 | 146 | 178 | 1846 | 191 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.07 | 0.10 | 0.10 | 0.09 | 0.21 | 0.16 | 0.16 | 0.41 | 0.41 | 0.10 | 0.30 | 0.30 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.838 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.754 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 263 | 48 | 272 | 26 | 23 | 15 | 19 | 1951 | 291 | 237 | 2015 | 58 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 263 | 48 | 272 | 26 | 23 | 15 | 19 | 1951 | 291 | 237 | 2015 | 58 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 66 | 12 | 68 | 7 | 6 | 4 | 5 | 488 | 73 | 59 | 504 | 15 |
| Total Analysis Volume [veh/h] | 263 | 48 | 272 | 26 | 23 | 15 | 19 | 1951 | 291 | 237 | 2015 | 58 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.08 | 0.09 | 0.16 | 0.02 | 0.02 | 0.02 | 0.01 | 0.38 | 0.17 | 0.14 | 0.41 | 0.41 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.754 | | | | | | | | | | | |

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 ICU Network.vistro
Report File: N:\...\Sat 2026+P.pdf

Scenario 9 Sat MD 2026+P
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | ICU 1 | WB Thru | 0.785 | - | C |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | ICU 1 | WB Thru | 0.786 | - | C |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | ICU 1 | EB Thru | 0.731 | - | C |
| 4 | Randolph Avenue at Birch Street | Signalized | ICU 1 | WB Thru | 0.532 | - | A |
| 5 | State College Boulevard at Birch Street | Signalized | ICU 1 | SB Thru | 0.731 | - | C |
| 6 | S Associated Road at Birch Street | Signalized | ICU 1 | EB Thru | 0.561 | - | A |
| 7 | Randolph Avenue at Madison Way | Signalized | ICU 1 | NB Thru | 0.307 | - | A |
| 8 | Randolph Avenue at Brea Mall | Signalized | ICU 1 | NB Thru | 0.517 | - | A |
| 9 | Brea Mall South at State College Boulevard | Signalized | ICU 1 | EB Left | 0.671 | - | B |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.731 | - | C |
| 11 | Puente Street at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.543 | - | A |
| 12 | Brea Boulevard at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.851 | - | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.895 | - | D |
| 14 | State College Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 1.219 | - | F |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.869 | - | D |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.818 | - | D |
| 17 | Associated Road at Imperial Highway | Signalized | ICU 1 | EB Right | 0.782 | - | C |
| 18 | Castlegate Lane/Placentia | Signalized | ICU 1 | EB Thru | 0.736 | | C |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.730 | - | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.785 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 139 | 280 | 398 | 547 | 389 | 5 | 19 | 1230 | 276 | 747 | 1631 | 751 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 139 | 280 | 398 | 547 | 389 | 5 | 19 | 1230 | 276 | 747 | 1631 | 751 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 35 | 70 | 100 | 137 | 97 | 1 | 5 | 308 | 69 | 187 | 408 | 188 |
| Total Analysis Volume [veh/h] | 139 | 280 | 398 | 547 | 389 | 5 | 19 | 1230 | 276 | 747 | 1631 | 751 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.13 | 0.13 | 0.16 | 0.12 | 0.12 | 0.01 | 0.22 | 0.22 | 0.22 | 0.32 | 0.28 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.785 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.786 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 837 | 0 | 1249 | 0 | 1580 | 580 | 199 | 1877 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 837 | 0 | 1249 | 0 | 1580 | 580 | 199 | 1877 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 209 | 0 | 312 | 0 | 395 | 145 | 50 | 469 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 837 | 0 | 1249 | 0 | 1580 | 580 | 199 | 1877 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 | 0.37 | 0.00 | 0.31 | 0.17 | 0.06 | 0.37 | 0.00 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.786 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.731 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1104 | 0 | 467 | 0 | 0 | 0 | 0 | 1699 | 722 | 0 | 971 | 425 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1104 | 0 | 467 | 0 | 0 | 0 | 0 | 1699 | 722 | 0 | 971 | 425 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 276 | 0 | 117 | 0 | 0 | 0 | 0 | 425 | 181 | 0 | 243 | 0 |
| Total Analysis Volume [veh/h] | 1104 | 0 | 467 | 0 | 0 | 0 | 0 | 1699 | 722 | 0 | 971 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.32 | 0.00 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.36 | 0.36 | 0.00 | 0.19 | 0.00 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.731 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.532 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 115 | 78 | 185 | 56 | 39 | 80 | 89 | 701 | 134 | 161 | 849 | 26 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 115 | 78 | 185 | 56 | 39 | 80 | 89 | 701 | 134 | 161 | 849 | 26 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 29 | 20 | 46 | 14 | 10 | 20 | 22 | 175 | 34 | 40 | 212 | 7 |
| Total Analysis Volume [veh/h] | 115 | 78 | 185 | 56 | 39 | 80 | 89 | 701 | 134 | 161 | 849 | 26 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.07 | 0.05 | 0.11 | 0.03 | 0.07 | 0.07 | 0.05 | 0.25 | 0.25 | 0.09 | 0.25 | 0.02 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.532 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.731 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 130 | 337 | 188 | 287 | 620 | 506 | 306 | 785 | 171 | 173 | 753 | 257 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 130 | 337 | 188 | 287 | 620 | 506 | 306 | 785 | 171 | 173 | 753 | 257 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 33 | 84 | 47 | 72 | 155 | 127 | 77 | 196 | 43 | 43 | 188 | 64 |
| Total Analysis Volume [veh/h] | 130 | 337 | 188 | 287 | 620 | 506 | 306 | 785 | 171 | 173 | 753 | 257 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.10 | 0.11 | 0.08 | 0.33 | 0.33 | 0.09 | 0.23 | 0.10 | 0.05 | 0.22 | 0.15 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.731 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.561 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 341 | 20 | 166 | 12 | 22 | 16 | 10 | 820 | 353 | 148 | 810 | 14 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 341 | 20 | 166 | 12 | 22 | 16 | 10 | 820 | 353 | 148 | 810 | 14 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 85 | 5 | 42 | 3 | 6 | 4 | 3 | 205 | 88 | 37 | 203 | 4 |
| Total Analysis Volume [veh/h] | 341 | 20 | 166 | 12 | 22 | 16 | 10 | 820 | 353 | 148 | 810 | 14 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.10 | 0.01 | 0.05 | 0.01 | 0.02 | 0.02 | 0.01 | 0.35 | 0.35 | 0.04 | 0.24 | 0.24 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.561 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.307 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 22 | 306 | 115 | 72 | 284 | 24 | 38 | 11 | 60 | 83 | 4 | 59 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 22 | 306 | 115 | 72 | 284 | 24 | 38 | 11 | 60 | 83 | 4 | 59 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 6 | 77 | 29 | 18 | 71 | 6 | 10 | 3 | 15 | 21 | 1 | 15 |
| Total Analysis Volume [veh/h] | 22 | 306 | 115 | 72 | 284 | 24 | 38 | 11 | 60 | 83 | 4 | 59 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.12 | 0.12 | 0.04 | 0.09 | 0.09 | 0.02 | 0.04 | 0.04 | 0.05 | 0.04 | 0.04 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.307 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.517 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 23 | 349 | 479 | 52 | 319 | 22 | 25 | 15 | 27 | 474 | 6 | 96 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 23 | 349 | 479 | 52 | 319 | 22 | 25 | 15 | 27 | 474 | 6 | 96 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 6 | 87 | 120 | 13 | 80 | 6 | 6 | 4 | 7 | 119 | 2 | 24 |
| Total Analysis Volume [veh/h] | 23 | 349 | 479 | 52 | 319 | 22 | 25 | 15 | 27 | 474 | 6 | 96 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.24 | 0.24 | 0.03 | 0.10 | 0.10 | 0.01 | 0.02 | 0.02 | 0.14 | 0.23 | 0.23 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.517 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.671 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 175 | 32 | 94 | 85 | 28 | 610 | 709 | 402 | 30 | 89 | 641 | 45 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 175 | 32 | 94 | 85 | 28 | 610 | 709 | 402 | 30 | 89 | 641 | 45 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 44 | 8 | 24 | 21 | 7 | 153 | 177 | 101 | 8 | 22 | 160 | 11 |
| Total Analysis Volume [veh/h] | 175 | 32 | 94 | 85 | 28 | 610 | 709 | 402 | 30 | 89 | 641 | 45 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.05 | 0.06 | 0.06 | 0.05 | 0.02 | 0.15 | 0.21 | 0.13 | 0.13 | 0.05 | 0.20 | 0.20 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.671 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.731 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 357 | 800 | 192 | 236 | 827 | 303 | 353 | 1223 | 283 | 350 | 1331 | 225 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 357 | 800 | 192 | 236 | 827 | 303 | 353 | 1223 | 283 | 350 | 1331 | 225 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 89 | 200 | 48 | 59 | 207 | 76 | 88 | 306 | 71 | 88 | 333 | 56 |
| Total Analysis Volume [veh/h] | 357 | 800 | 192 | 236 | 827 | 303 | 353 | 1223 | 283 | 350 | 1331 | 225 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.11 | 0.16 | 0.11 | 0.07 | 0.16 | 0.18 | 0.10 | 0.30 | 0.30 | 0.10 | 0.26 | 0.13 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.731 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.543 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 27 | 31 | 99 | 166 | 44 | 128 | 82 | 1402 | 37 | 84 | 1474 | 195 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 27 | 31 | 99 | 166 | 44 | 128 | 82 | 1402 | 37 | 84 | 1474 | 195 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 8 | 25 | 42 | 11 | 32 | 21 | 351 | 9 | 21 | 369 | 49 |
| Total Analysis Volume [veh/h] | 27 | 31 | 99 | 166 | 44 | 128 | 82 | 1402 | 37 | 84 | 1474 | 195 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.02 | 0.06 | 0.10 | 0.01 | 0.08 | 0.05 | 0.28 | 0.28 | 0.05 | 0.29 | 0.11 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.543 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.851 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 437 | 574 | 294 | 467 | 933 | 253 | 274 | 1454 | 288 | 385 | 1433 | 414 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 437 | 574 | 294 | 467 | 933 | 253 | 274 | 1454 | 288 | 385 | 1433 | 414 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 109 | 144 | 74 | 117 | 233 | 63 | 69 | 364 | 72 | 96 | 358 | 104 |
| Total Analysis Volume [veh/h] | 437 | 574 | 294 | 467 | 933 | 253 | 274 | 1454 | 288 | 385 | 1433 | 414 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.13 | 0.11 | 0.17 | 0.14 | 0.27 | 0.15 | 0.08 | 0.29 | 0.17 | 0.11 | 0.28 | 0.24 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.851 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.895 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 102 | 47 | 199 | 446 | 86 | 352 | 344 | 1626 | 65 | 142 | 1880 | 496 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 102 | 47 | 199 | 446 | 86 | 352 | 344 | 1626 | 65 | 142 | 1880 | 496 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 26 | 12 | 50 | 112 | 22 | 88 | 86 | 407 | 16 | 36 | 470 | 124 |
| Total Analysis Volume [veh/h] | 102 | 47 | 199 | 446 | 86 | 352 | 344 | 1626 | 65 | 142 | 1880 | 496 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

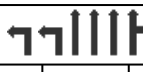
**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.06 | 0.07 | 0.07 | 0.13 | 0.26 | 0.26 | 0.10 | 0.33 | 0.33 | 0.08 | 0.37 | 0.29 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.895 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | F |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.219 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 331 | 564 | 607 | 655 | 443 | 186 | 139 | 1695 | 233 | 684 | 2092 | 991 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 331 | 564 | 607 | 655 | 443 | 186 | 139 | 1695 | 233 | 684 | 2092 | 991 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 83 | 141 | 152 | 164 | 111 | 47 | 35 | 424 | 58 | 171 | 523 | 248 |
| Total Analysis Volume [veh/h] | 331 | 564 | 607 | 655 | 443 | 186 | 139 | 1695 | 233 | 684 | 2092 | 991 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.10 | 0.17 | 0.36 | 0.33 | 0.19 | 0.19 | 0.04 | 0.28 | 0.28 | 0.20 | 0.41 | 0.26 |
| Intersection LOS | F | | | | | | | | | | | |
| Intersection V/C | 1.219 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.869 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 555 | 0 | 782 | 0 | 2051 | 1213 | 0 | 2838 | 349 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 555 | 0 | 782 | 0 | 2051 | 1213 | 0 | 2838 | 349 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 139 | 0 | 196 | 0 | 513 | 303 | 0 | 710 | 87 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 555 | 0 | 782 | 0 | 2051 | 1213 | 0 | 2838 | 349 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |

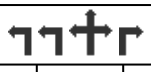
**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.16 | 0.00 | 0.26 | 0.00 | 0.40 | 0.00 | 0.00 | 0.56 | 0.00 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.869 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.818 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1506 | 73 | 606 | 0 | 0 | 258 | 237 | 2014 | 603 | 0 | 2051 | 36 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1506 | 73 | 606 | 0 | 0 | 258 | 237 | 2014 | 603 | 0 | 2051 | 36 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 377 | 18 | 152 | 0 | 0 | 65 | 59 | 504 | 151 | 0 | 513 | 9 |
| Total Analysis Volume [veh/h] | 1506 | 73 | 606 | 0 | 0 | 258 | 237 | 2014 | 603 | 0 | 2051 | 36 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.30 | 0.32 | 0.32 | 0.00 | 0.00 | 0.00 | 0.14 | 0.39 | 0.00 | 0.00 | 0.31 | 0.31 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.818 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.782 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 250 | 186 | 115 | 313 | 238 | 194 | 244 | 1929 | 257 | 152 | 1688 | 217 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 250 | 186 | 115 | 313 | 238 | 194 | 244 | 1929 | 257 | 152 | 1688 | 217 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 63 | 47 | 29 | 78 | 60 | 49 | 61 | 482 | 64 | 38 | 422 | 54 |
| Total Analysis Volume [veh/h] | 250 | 186 | 115 | 313 | 238 | 194 | 244 | 1929 | 257 | 152 | 1688 | 217 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.07 | 0.09 | 0.09 | 0.09 | 0.14 | 0.11 | 0.14 | 0.43 | 0.43 | 0.09 | 0.28 | 0.28 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.782 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.736 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 184 | 18 | 244 | 27 | 11 | 12 | 25 | 2050 | 312 | 212 | 1960 | 48 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 184 | 18 | 244 | 27 | 11 | 12 | 25 | 2050 | 312 | 212 | 1960 | 48 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 46 | 5 | 61 | 7 | 3 | 3 | 6 | 513 | 78 | 53 | 490 | 12 |
| Total Analysis Volume [veh/h] | 184 | 18 | 244 | 27 | 11 | 12 | 25 | 2050 | 312 | 212 | 1960 | 48 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.05 | 0.06 | 0.14 | 0.02 | 0.01 | 0.01 | 0.01 | 0.40 | 0.18 | 0.12 | 0.39 | 0.39 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.736 | | | | | | | | | | | |

*APPENDIX C-IV*

# YEAR 2026 PLUS PROJECT WITH IMPROVEMENTS TRAFFIC CONDITIONS

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 ICU Network.vistro
Report File: N:\...\AM 2026+P-MIT.pdf

Scenario 21 [MIT] AM 2026+P
4/13/2022

**Intersection Analysis Summary**

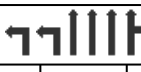
| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 14 | State College Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.759 | - | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.759 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 119 | 178 | 429 | 126 | 407 | 28 | 35 | 1725 | 204 | 462 | 1859 | 196 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 119 | 178 | 429 | 126 | 407 | 28 | 35 | 1725 | 204 | 462 | 1859 | 196 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 30 | 45 | 107 | 32 | 102 | 7 | 9 | 431 | 51 | 116 | 465 | 49 |
| Total Analysis Volume [veh/h] | 119 | 178 | 429 | 126 | 407 | 28 | 35 | 1725 | 204 | 462 | 1859 | 196 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.05 | 0.25 | 0.04 | 0.12 | 0.02 | 0.01 | 0.28 | 0.28 | 0.14 | 0.36 | 0.08 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.759 | | | | | | | | | | | |

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 ICU Network.vistro
Report File: N:\...\PM 2026+P-MIT.pdf

Scenario 20 [MIT] PM 2026+P
4/13/2022

**Intersection Analysis Summary**

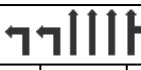
| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 14 | State College Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.853 | - | D |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.853 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 391 | 625 | 370 | 463 | 323 | 98 | 112 | 1991 | 116 | 474 | 2019 | 574 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 391 | 625 | 370 | 463 | 323 | 98 | 112 | 1991 | 116 | 474 | 2019 | 574 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 98 | 156 | 93 | 116 | 81 | 25 | 28 | 498 | 29 | 119 | 505 | 144 |
| Total Analysis Volume [veh/h] | 391 | 625 | 370 | 463 | 323 | 98 | 112 | 1991 | 116 | 474 | 2019 | 574 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.12 | 0.18 | 0.22 | 0.14 | 0.10 | 0.06 | 0.03 | 0.31 | 0.31 | 0.14 | 0.40 | 0.20 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.853 | | | | | | | | | | | |

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 ICU Network.vistro
Report File: N:\...\Sat 2026+P-MIT.pdf

Scenario 19 [MIT] Sat MD 2026+P
4/13/2022

**Intersection Analysis Summary**

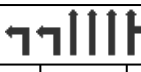
| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 14 | State College Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 1.084 | - | F |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | F |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.084 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 331 | 564 | 607 | 655 | 443 | 186 | 139 | 1695 | 233 | 684 | 2092 | 991 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 331 | 564 | 607 | 655 | 443 | 186 | 139 | 1695 | 233 | 684 | 2092 | 991 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 83 | 141 | 152 | 164 | 111 | 47 | 35 | 424 | 58 | 171 | 523 | 248 |
| Total Analysis Volume [veh/h] | 331 | 564 | 607 | 655 | 443 | 186 | 139 | 1695 | 233 | 684 | 2092 | 991 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.10 | 0.17 | 0.36 | 0.19 | 0.13 | 0.11 | 0.04 | 0.28 | 0.28 | 0.20 | 0.41 | 0.39 |
| Intersection LOS | F | | | | | | | | | | | |
| Intersection V/C | 1.084 | | | | | | | | | | | |

*APPENDIX C-V*

# YEAR 2045 TRAFFIC CONDITIONS

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 ICU Network.vistro
Report File: N:\...\AM 2045.pdf

Scenario 10 AM 2045
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | ICU 1 | WB Thru | 0.867 | - | D |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | ICU 1 | WB Thru | 0.834 | - | D |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | ICU 1 | EB Thru | 0.885 | - | D |
| 4 | Randolph Avenue at Birch Street | Signalized | ICU 1 | EB Right | 0.430 | - | A |
| 5 | State College Boulevard at Birch Street | Signalized | ICU 1 | SB Thru | 0.670 | - | B |
| 6 | S Associated Road at Birch Street | Signalized | ICU 1 | EB Thru | 0.734 | - | C |
| 7 | Randolph Avenue at Madison Way | Signalized | ICU 1 | NB Thru | 0.150 | - | A |
| 8 | Randolph Avenue at Brea Mall | Signalized | ICU 1 | NB Thru | 0.148 | - | A |
| 9 | Brea Mall South at State College Boulevard | Signalized | ICU 1 | WB Thru | 0.245 | - | A |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | ICU 1 | EB Right | 1.026 | - | F |
| 11 | Puente Street at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.772 | - | C |
| 12 | Brea Boulevard at Imperial Highway | Signalized | ICU 1 | SB Thru | 0.947 | - | E |
| 13 | Randolph Avenue at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.515 | - | A |
| 14 | State College Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.837 | - | D |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.719 | - | C |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | ICU 1 | NB Thru | 0.672 | - | B |
| 17 | Associated Road at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.832 | - | D |
| 18 | Castlegate Lane/Placentia | Signalized | ICU 1 | EB Thru | 0.717 | | C |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.717 | - | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.867 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 194 | 247 | 228 | 1011 | 688 | 9 | 16 | 1594 | 238 | 534 | 2035 | 627 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 194 | 247 | 228 | 1011 | 688 | 9 | 16 | 1594 | 238 | 534 | 2035 | 627 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 49 | 62 | 57 | 253 | 172 | 2 | 4 | 399 | 60 | 134 | 509 | 157 |
| Total Analysis Volume [veh/h] | 194 | 247 | 228 | 1011 | 688 | 9 | 16 | 1594 | 238 | 534 | 2035 | 627 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.06 | 0.09 | 0.09 | 0.30 | 0.21 | 0.21 | 0.00 | 0.27 | 0.27 | 0.16 | 0.40 | 0.07 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.867 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.834 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 1084 | 0 | 725 | 0 | 1946 | 650 | 285 | 2284 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 1084 | 0 | 725 | 0 | 1946 | 650 | 285 | 2284 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 271 | 0 | 181 | 0 | 487 | 163 | 71 | 571 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 1084 | 0 | 725 | 0 | 1946 | 650 | 285 | 2284 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.32 | 0.00 | 0.21 | 0.00 | 0.38 | 0.19 | 0.08 | 0.45 | 0.00 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.834 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.885 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | | | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1104 | 0 | 534 | 0 | 0 | 0 | 0 | 2603 | 419 | 0 | 1456 | 530 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1104 | 0 | 534 | 0 | 0 | 0 | 0 | 2603 | 419 | 0 | 1456 | 530 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 276 | 0 | 134 | 0 | 0 | 0 | 0 | 651 | 105 | 0 | 364 | 0 |
| Total Analysis Volume [veh/h] | 1104 | 0 | 534 | 0 | 0 | 0 | 0 | 2603 | 419 | 0 | 1456 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.32 | 0.00 | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.51 | 0.25 | 0.00 | 0.29 | 0.00 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.885 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.430 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 26 | 44 | 98 | 86 | 38 | 37 | 43 | 656 | 99 | 84 | 597 | 61 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 26 | 44 | 98 | 86 | 38 | 37 | 43 | 656 | 99 | 84 | 597 | 61 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 11 | 25 | 22 | 10 | 9 | 11 | 164 | 25 | 21 | 149 | 15 |
| Total Analysis Volume [veh/h] | 26 | 44 | 98 | 86 | 38 | 37 | 43 | 656 | 99 | 84 | 597 | 61 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.03 | 0.06 | 0.05 | 0.04 | 0.04 | 0.03 | 0.22 | 0.22 | 0.05 | 0.18 | 0.04 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.430 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.670 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 88 | 166 | 114 | 776 | 964 | 254 | 125 | 579 | 68 | 101 | 663 | 338 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 88 | 166 | 114 | 776 | 964 | 254 | 125 | 579 | 68 | 101 | 663 | 338 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 22 | 42 | 29 | 194 | 241 | 64 | 31 | 145 | 17 | 25 | 166 | 85 |
| Total Analysis Volume [veh/h] | 88 | 166 | 114 | 776 | 964 | 254 | 125 | 579 | 68 | 101 | 663 | 338 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.03 | 0.05 | 0.07 | 0.23 | 0.36 | 0.36 | 0.04 | 0.17 | 0.04 | 0.03 | 0.20 | 0.20 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.670 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.734 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 286 | 7 | 364 | 63 | 34 | 11 | 5 | 1098 | 374 | 405 | 894 | 11 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 286 | 7 | 364 | 63 | 34 | 11 | 5 | 1098 | 374 | 405 | 894 | 11 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 72 | 2 | 91 | 16 | 9 | 3 | 1 | 275 | 94 | 101 | 224 | 3 |
| Total Analysis Volume [veh/h] | 286 | 7 | 364 | 63 | 34 | 11 | 5 | 1098 | 374 | 405 | 894 | 11 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.08 | 0.00 | 0.10 | 0.04 | 0.03 | 0.03 | 0.00 | 0.43 | 0.43 | 0.12 | 0.27 | 0.27 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.734 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.150 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 28 | 146 | 9 | 6 | 137 | 18 | 36 | 3 | 62 | 0 | 0 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 28 | 146 | 9 | 6 | 137 | 18 | 36 | 3 | 62 | 0 | 0 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 37 | 2 | 2 | 34 | 5 | 9 | 1 | 16 | 0 | 0 | 0 |
| Total Analysis Volume [veh/h] | 28 | 146 | 9 | 6 | 137 | 18 | 36 | 3 | 62 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.05 | 0.05 | 0.00 | 0.05 | 0.05 | 0.02 | 0.04 | 0.04 | 0.00 | 0.00 | 0.00 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.150 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.148 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 14 | 190 | 72 | 17 | 166 | 6 | 1 | 0 | 1 | 28 | 0 | 7 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 14 | 190 | 72 | 17 | 166 | 6 | 1 | 0 | 1 | 28 | 0 | 7 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 48 | 18 | 4 | 42 | 2 | 0 | 0 | 0 | 7 | 0 | 2 |
| Total Analysis Volume [veh/h] | 14 | 190 | 72 | 17 | 166 | 6 | 1 | 0 | 1 | 28 | 0 | 7 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.08 | 0.08 | 0.01 | 0.05 | 0.05 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.148 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.245 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 34 | 9 | 17 | 3 | 6 | 28 | 84 | 284 | 17 | 30 | 512 | 15 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 34 | 9 | 17 | 3 | 6 | 28 | 84 | 284 | 17 | 30 | 512 | 15 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 9 | 2 | 4 | 1 | 2 | 7 | 21 | 71 | 4 | 8 | 128 | 4 |
| Total Analysis Volume [veh/h] | 34 | 9 | 17 | 3 | 6 | 28 | 84 | 284 | 17 | 30 | 512 | 15 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 0.09 | 0.09 | 0.02 | 0.16 | 0.16 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.245 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | F |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.026 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 387 | 773 | 293 | 179 | 1484 | 334 | 303 | 1469 | 759 | 424 | 1315 | 275 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 387 | 773 | 293 | 179 | 1484 | 334 | 303 | 1469 | 759 | 424 | 1315 | 275 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 97 | 193 | 73 | 45 | 371 | 84 | 76 | 367 | 190 | 106 | 329 | 69 |
| Total Analysis Volume [veh/h] | 387 | 773 | 293 | 179 | 1484 | 334 | 303 | 1469 | 759 | 424 | 1315 | 275 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.11 | 0.15 | 0.17 | 0.05 | 0.29 | 0.20 | 0.09 | 0.44 | 0.44 | 0.12 | 0.26 | 0.16 |
| Intersection LOS | F | | | | | | | | | | | |
| Intersection V/C | 1.026 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.772 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 64 | 124 | 166 | 295 | 121 | 263 | 246 | 1454 | 85 | 53 | 1559 | 193 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 64 | 124 | 166 | 295 | 121 | 263 | 246 | 1454 | 85 | 53 | 1559 | 193 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 16 | 31 | 42 | 74 | 30 | 66 | 62 | 364 | 21 | 13 | 390 | 48 |
| Total Analysis Volume [veh/h] | 64 | 124 | 166 | 295 | 121 | 263 | 246 | 1454 | 85 | 53 | 1559 | 193 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

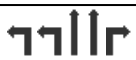
**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.04 | 0.07 | 0.10 | 0.17 | 0.04 | 0.15 | 0.14 | 0.30 | 0.30 | 0.03 | 0.31 | 0.11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.772 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | E |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.947 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 473 | 581 | 189 | 181 | 1222 | 228 | 177 | 1689 | 395 | 210 | 1767 | 122 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 473 | 581 | 189 | 181 | 1222 | 228 | 177 | 1689 | 395 | 210 | 1767 | 122 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 118 | 145 | 47 | 45 | 306 | 57 | 44 | 422 | 99 | 53 | 442 | 31 |
| Total Analysis Volume [veh/h] | 473 | 581 | 189 | 181 | 1222 | 228 | 177 | 1689 | 395 | 210 | 1767 | 122 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.14 | 0.11 | 0.11 | 0.05 | 0.36 | 0.13 | 0.05 | 0.33 | 0.23 | 0.06 | 0.35 | 0.07 |
| Intersection LOS | E | | | | | | | | | | | |
| Intersection V/C | 0.947 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.515 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 39 | 20 | 71 | 140 | 22 | 41 | 96 | 1742 | 27 | 43 | 1882 | 164 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 39 | 20 | 71 | 140 | 22 | 41 | 96 | 1742 | 27 | 43 | 1882 | 164 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 10 | 5 | 18 | 35 | 6 | 10 | 24 | 436 | 7 | 11 | 471 | 41 |
| Total Analysis Volume [veh/h] | 39 | 20 | 71 | 140 | 22 | 41 | 96 | 1742 | 27 | 43 | 1882 | 164 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

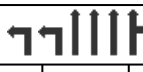
**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.02 | 0.03 | 0.03 | 0.04 | 0.04 | 0.04 | 0.03 | 0.35 | 0.35 | 0.03 | 0.37 | 0.10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.515 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.837 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 121 | 168 | 479 | 127 | 487 | 33 | 37 | 1734 | 204 | 534 | 1939 | 153 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 121 | 168 | 479 | 127 | 487 | 33 | 37 | 1734 | 204 | 534 | 1939 | 153 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 30 | 42 | 120 | 32 | 122 | 8 | 9 | 434 | 51 | 134 | 485 | 38 |
| Total Analysis Volume [veh/h] | 121 | 168 | 479 | 127 | 487 | 33 | 37 | 1734 | 204 | 534 | 1939 | 153 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.04 | 0.05 | 0.28 | 0.06 | 0.15 | 0.15 | 0.01 | 0.29 | 0.29 | 0.16 | 0.38 | 0.03 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.837 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.719 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 684 | 0 | 562 | 0 | 1697 | 805 | 0 | 2168 | 232 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 684 | 0 | 562 | 0 | 1697 | 805 | 0 | 2168 | 232 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 171 | 0 | 141 | 0 | 424 | 201 | 0 | 542 | 58 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 684 | 0 | 562 | 0 | 1697 | 805 | 0 | 2168 | 232 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |

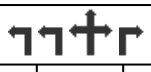
**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.24 | 0.00 | 0.33 | 0.00 | 0.00 | 0.43 | 0.00 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.719 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.672 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1125 | 31 | 949 | 0 | 0 | 86 | 98 | 1521 | 627 | 0 | 1721 | 14 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1125 | 31 | 949 | 0 | 0 | 86 | 98 | 1521 | 627 | 0 | 1721 | 14 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 281 | 8 | 237 | 0 | 0 | 22 | 25 | 380 | 157 | 0 | 430 | 4 |
| Total Analysis Volume [veh/h] | 1125 | 31 | 949 | 0 | 0 | 86 | 98 | 1521 | 627 | 0 | 1721 | 14 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.22 | 0.31 | 0.31 | 0.00 | 0.00 | 0.00 | 0.06 | 0.30 | 0.00 | 0.00 | 0.26 | 0.26 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.672 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.832 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 168 | 241 | 94 | 190 | 382 | 183 | 237 | 2167 | 113 | 104 | 1792 | 112 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 168 | 241 | 94 | 190 | 382 | 183 | 237 | 2167 | 113 | 104 | 1792 | 112 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 42 | 60 | 24 | 48 | 96 | 46 | 59 | 542 | 28 | 26 | 448 | 28 |
| Total Analysis Volume [veh/h] | 168 | 241 | 94 | 190 | 382 | 183 | 237 | 2167 | 113 | 104 | 1792 | 112 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.05 | 0.10 | 0.10 | 0.06 | 0.22 | 0.11 | 0.14 | 0.45 | 0.45 | 0.06 | 0.28 | 0.28 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.832 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.717 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 191 | 14 | 167 | 28 | 33 | 16 | 14 | 2152 | 478 | 201 | 1740 | 37 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 191 | 14 | 167 | 28 | 33 | 16 | 14 | 2152 | 478 | 201 | 1740 | 37 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 48 | 4 | 42 | 7 | 8 | 4 | 4 | 538 | 120 | 50 | 435 | 9 |
| Total Analysis Volume [veh/h] | 191 | 14 | 167 | 28 | 33 | 16 | 14 | 2152 | 478 | 201 | 1740 | 37 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.06 | 0.06 | 0.10 | 0.02 | 0.03 | 0.03 | 0.01 | 0.42 | 0.28 | 0.12 | 0.35 | 0.35 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.717 | | | | | | | | | | | |

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 ICU Network.vistro
Report File: N:\...\PM 2045.pdf

Scenario 11 PM 2045
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | ICU 1 | EB Thru | 0.863 | - | D |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | ICU 1 | WB Thru | 0.689 | - | B |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | ICU 1 | EB Right | 0.588 | - | A |
| 4 | Randolph Avenue at Birch Street | Signalized | ICU 1 | WB Thru | 0.643 | - | B |
| 5 | State College Boulevard at Birch Street | Signalized | ICU 1 | WB Right | 0.860 | - | D |
| 6 | S Associated Road at Birch Street | Signalized | ICU 1 | WB Thru | 0.740 | - | C |
| 7 | Randolph Avenue at Madison Way | Signalized | ICU 1 | NB Thru | 0.268 | - | A |
| 8 | Randolph Avenue at Brea Mall | Signalized | ICU 1 | NB Thru | 0.392 | - | A |
| 9 | Brea Mall South at State College Boulevard | Signalized | ICU 1 | EB Thru | 0.491 | - | A |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | ICU 1 | EB Thru | 1.022 | - | F |
| 11 | Puente Street at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.704 | - | C |
| 12 | Brea Boulevard at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.879 | - | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.734 | - | C |
| 14 | State College Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 1.028 | - | F |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.836 | - | D |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.816 | - | D |
| 17 | Associated Road at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.935 | - | E |
| 18 | Castlegate Lane/Placentia | Signalized | ICU 1 | WB Right | 0.842 | | D |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | ICU 1 | WB Right | 0.842 | - | D |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.863 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 368 | 685 | 345 | 637 | 455 | 17 | 44 | 1694 | 302 | 443 | 1361 | 801 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 368 | 685 | 345 | 637 | 455 | 17 | 44 | 1694 | 302 | 443 | 1361 | 801 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 92 | 171 | 86 | 159 | 114 | 4 | 11 | 424 | 76 | 111 | 340 | 200 |
| Total Analysis Volume [veh/h] | 368 | 685 | 345 | 637 | 455 | 17 | 44 | 1694 | 302 | 443 | 1361 | 801 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.11 | 0.20 | 0.20 | 0.19 | 0.14 | 0.14 | 0.01 | 0.29 | 0.29 | 0.13 | 0.27 | 0.28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.863 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.689 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 497 | 0 | 888 | 0 | 1508 | 877 | 280 | 1832 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 497 | 0 | 888 | 0 | 1508 | 877 | 280 | 1832 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 124 | 0 | 222 | 0 | 377 | 219 | 70 | 458 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 497 | 0 | 888 | 0 | 1508 | 877 | 280 | 1832 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.15 | 0.00 | 0.26 | 0.00 | 0.30 | 0.26 | 0.08 | 0.36 | 0.00 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.689 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.588 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 710 | 0 | 330 | 0 | 0 | 0 | 0 | 1637 | 600 | 0 | 1199 | 571 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 710 | 0 | 330 | 0 | 0 | 0 | 0 | 1637 | 600 | 0 | 1199 | 571 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 178 | 0 | 83 | 0 | 0 | 0 | 0 | 409 | 150 | 0 | 300 | 0 |
| Total Analysis Volume [veh/h] | 710 | 0 | 330 | 0 | 0 | 0 | 0 | 1637 | 600 | 0 | 1199 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.21 | 0.00 | 0.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 | 0.33 | 0.00 | 0.24 | 0.00 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.588 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.643 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 143 | 75 | 186 | 55 | 53 | 112 | 93 | 770 | 103 | 206 | 1215 | 49 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 143 | 75 | 186 | 55 | 53 | 112 | 93 | 770 | 103 | 206 | 1215 | 49 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 36 | 19 | 47 | 14 | 13 | 28 | 23 | 193 | 26 | 52 | 304 | 12 |
| Total Analysis Volume [veh/h] | 143 | 75 | 186 | 55 | 53 | 112 | 93 | 770 | 103 | 206 | 1215 | 49 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.08 | 0.04 | 0.11 | 0.03 | 0.10 | 0.10 | 0.05 | 0.26 | 0.26 | 0.12 | 0.36 | 0.03 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.643 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.860 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 157 | 468 | 182 | 393 | 415 | 363 | 320 | 892 | 182 | 165 | 1138 | 749 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 157 | 468 | 182 | 393 | 415 | 363 | 320 | 892 | 182 | 165 | 1138 | 749 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 39 | 117 | 46 | 98 | 104 | 91 | 80 | 223 | 46 | 41 | 285 | 187 |
| Total Analysis Volume [veh/h] | 157 | 468 | 182 | 393 | 415 | 363 | 320 | 892 | 182 | 165 | 1138 | 749 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.05 | 0.14 | 0.11 | 0.12 | 0.23 | 0.23 | 0.09 | 0.26 | 0.11 | 0.05 | 0.33 | 0.44 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.860 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.740 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 559 | 37 | 403 | 11 | 23 | 11 | 17 | 1039 | 349 | 332 | 1466 | 19 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 559 | 37 | 403 | 11 | 23 | 11 | 17 | 1039 | 349 | 332 | 1466 | 19 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 140 | 9 | 101 | 3 | 6 | 3 | 4 | 260 | 87 | 83 | 367 | 5 |
| Total Analysis Volume [veh/h] | 559 | 37 | 403 | 11 | 23 | 11 | 17 | 1039 | 349 | 332 | 1466 | 19 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.16 | 0.02 | 0.14 | 0.01 | 0.02 | 0.02 | 0.01 | 0.41 | 0.41 | 0.10 | 0.44 | 0.44 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.740 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.268 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 48 | 361 | 45 | 29 | 273 | 32 | 68 | 4 | 55 | 79 | 4 | 38 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 48 | 361 | 45 | 29 | 273 | 32 | 68 | 4 | 55 | 79 | 4 | 38 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 12 | 90 | 11 | 7 | 68 | 8 | 17 | 1 | 14 | 20 | 1 | 10 |
| Total Analysis Volume [veh/h] | 48 | 361 | 45 | 29 | 273 | 32 | 68 | 4 | 55 | 79 | 4 | 38 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.03 | 0.12 | 0.12 | 0.02 | 0.09 | 0.09 | 0.04 | 0.03 | 0.03 | 0.05 | 0.02 | 0.02 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.268 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.392 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 17 | 367 | 338 | 39 | 392 | 21 | 18 | 3 | 12 | 288 | 3 | 48 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 17 | 367 | 338 | 39 | 392 | 21 | 18 | 3 | 12 | 288 | 3 | 48 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 92 | 85 | 10 | 98 | 5 | 5 | 1 | 3 | 72 | 1 | 12 |
| Total Analysis Volume [veh/h] | 17 | 367 | 338 | 39 | 392 | 21 | 18 | 3 | 12 | 288 | 3 | 48 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.21 | 0.21 | 0.02 | 0.12 | 0.12 | 0.01 | 0.01 | 0.01 | 0.08 | 0.13 | 0.13 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.392 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.491 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 151 | 26 | 67 | 45 | 20 | 402 | 519 | 596 | 23 | 104 | 490 | 28 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 151 | 26 | 67 | 45 | 20 | 402 | 519 | 596 | 23 | 104 | 490 | 28 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 38 | 7 | 17 | 11 | 5 | 101 | 130 | 149 | 6 | 26 | 123 | 7 |
| Total Analysis Volume [veh/h] | 151 | 26 | 67 | 45 | 20 | 402 | 519 | 596 | 23 | 104 | 490 | 28 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.05 | 0.04 | 0.03 | 0.01 | 0.08 | 0.15 | 0.18 | 0.18 | 0.06 | 0.15 | 0.15 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.491 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | F |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.022 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 786 | 1305 | 282 | 288 | 1020 | 439 | 336 | 1361 | 417 | 455 | 1692 | 299 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 786 | 1305 | 282 | 288 | 1020 | 439 | 336 | 1361 | 417 | 455 | 1692 | 299 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 197 | 326 | 71 | 72 | 255 | 110 | 84 | 340 | 104 | 114 | 423 | 75 |
| Total Analysis Volume [veh/h] | 786 | 1305 | 282 | 288 | 1020 | 439 | 336 | 1361 | 417 | 455 | 1692 | 299 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.23 | 0.26 | 0.17 | 0.08 | 0.20 | 0.26 | 0.10 | 0.35 | 0.35 | 0.13 | 0.33 | 0.18 |
| Intersection LOS | F | | | | | | | | | | | |
| Intersection V/C | 1.022 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.704 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 38 | 51 | 89 | 236 | 113 | 228 | 146 | 1702 | 40 | 112 | 1921 | 399 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 38 | 51 | 89 | 236 | 113 | 228 | 146 | 1702 | 40 | 112 | 1921 | 399 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 10 | 13 | 22 | 59 | 28 | 57 | 37 | 426 | 10 | 28 | 480 | 100 |
| Total Analysis Volume [veh/h] | 38 | 51 | 89 | 236 | 113 | 228 | 146 | 1702 | 40 | 112 | 1921 | 399 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.03 | 0.05 | 0.14 | 0.03 | 0.13 | 0.09 | 0.34 | 0.34 | 0.07 | 0.38 | 0.23 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.704 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.879 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 553 | 989 | 298 | 277 | 712 | 234 | 263 | 1927 | 455 | 270 | 1872 | 207 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 553 | 989 | 298 | 277 | 712 | 234 | 263 | 1927 | 455 | 270 | 1872 | 207 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 138 | 247 | 75 | 69 | 178 | 59 | 66 | 482 | 114 | 68 | 468 | 52 |
| Total Analysis Volume [veh/h] | 553 | 989 | 298 | 277 | 712 | 234 | 263 | 1927 | 455 | 270 | 1872 | 207 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.16 | 0.19 | 0.18 | 0.08 | 0.21 | 0.14 | 0.08 | 0.38 | 0.27 | 0.08 | 0.37 | 0.12 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.879 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.734 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 61 | 41 | 72 | 350 | 32 | 230 | 270 | 1903 | 47 | 77 | 2114 | 356 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 61 | 41 | 72 | 350 | 32 | 230 | 270 | 1903 | 47 | 77 | 2114 | 356 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 15 | 10 | 18 | 88 | 8 | 58 | 68 | 476 | 12 | 19 | 529 | 89 |
| Total Analysis Volume [veh/h] | 61 | 41 | 72 | 350 | 32 | 230 | 270 | 1903 | 47 | 77 | 2114 | 356 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.02 | 0.03 | 0.03 | 0.10 | 0.15 | 0.15 | 0.08 | 0.38 | 0.38 | 0.05 | 0.41 | 0.21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.734 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | F |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.028 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 385 | 628 | 471 | 464 | 331 | 103 | 118 | 2080 | 118 | 497 | 2038 | 518 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 385 | 628 | 471 | 464 | 331 | 103 | 118 | 2080 | 118 | 497 | 2038 | 518 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 96 | 157 | 118 | 116 | 83 | 26 | 30 | 520 | 30 | 124 | 510 | 130 |
| Total Analysis Volume [veh/h] | 385 | 628 | 471 | 464 | 331 | 103 | 118 | 2080 | 118 | 497 | 2038 | 518 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.11 | 0.18 | 0.28 | 0.23 | 0.13 | 0.13 | 0.03 | 0.32 | 0.32 | 0.15 | 0.40 | 0.07 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | F | | | | | | | | | | | |
| Intersection V/C | 1.028 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.836 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 764 | 0 | 601 | 0 | 1892 | 1130 | 0 | 2644 | 475 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 764 | 0 | 601 | 0 | 1892 | 1130 | 0 | 2644 | 475 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 191 | 0 | 150 | 0 | 473 | 283 | 0 | 661 | 119 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 764 | 0 | 601 | 0 | 1892 | 1130 | 0 | 2644 | 475 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.22 | 0.00 | 0.27 | 0.00 | 0.37 | 0.00 | 0.00 | 0.52 | 0.00 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.836 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.816 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1115 | 64 | 506 | 0 | 0 | 192 | 182 | 2113 | 421 | 0 | 2761 | 38 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1115 | 64 | 506 | 0 | 0 | 192 | 182 | 2113 | 421 | 0 | 2761 | 38 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 279 | 16 | 127 | 0 | 0 | 48 | 46 | 528 | 105 | 0 | 690 | 10 |
| Total Analysis Volume [veh/h] | 1115 | 64 | 506 | 0 | 0 | 192 | 182 | 2113 | 421 | 0 | 2761 | 38 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.22 | 0.25 | 0.25 | 0.00 | 0.00 | 0.00 | 0.11 | 0.41 | 0.00 | 0.00 | 0.41 | 0.41 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.816 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | E |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.935 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 245 | 299 | 102 | 335 | 402 | 289 | 309 | 2154 | 158 | 210 | 1954 | 213 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 245 | 299 | 102 | 335 | 402 | 289 | 309 | 2154 | 158 | 210 | 1954 | 213 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 61 | 75 | 26 | 84 | 101 | 72 | 77 | 539 | 40 | 53 | 489 | 53 |
| Total Analysis Volume [veh/h] | 245 | 299 | 102 | 335 | 402 | 289 | 309 | 2154 | 158 | 210 | 1954 | 213 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.07 | 0.12 | 0.12 | 0.10 | 0.24 | 0.17 | 0.18 | 0.45 | 0.45 | 0.12 | 0.32 | 0.32 |
| Intersection LOS | E | | | | | | | | | | | |
| Intersection V/C | 0.935 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.842 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 275 | 54 | 310 | 29 | 26 | 16 | 22 | 2179 | 313 | 268 | 2235 | 66 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 275 | 54 | 310 | 29 | 26 | 16 | 22 | 2179 | 313 | 268 | 2235 | 66 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 69 | 14 | 78 | 7 | 7 | 4 | 6 | 545 | 78 | 67 | 559 | 17 |
| Total Analysis Volume [veh/h] | 275 | 54 | 310 | 29 | 26 | 16 | 22 | 2179 | 313 | 268 | 2235 | 66 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.08 | 0.10 | 0.18 | 0.02 | 0.02 | 0.02 | 0.01 | 0.43 | 0.18 | 0.16 | 0.45 | 0.45 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.842 | | | | | | | | | | | |

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 ICU Network.vistro
Report File: N:\...\Sat 2045.pdf

Scenario 12 Sat MD 2045
4/18/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | ICU 1 | WB Thru | 0.822 | - | D |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | ICU 1 | WB Thru | 0.837 | - | D |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | ICU 1 | EB Thru | 0.770 | - | C |
| 4 | Randolph Avenue at Birch Street | Signalized | ICU 1 | WB Thru | 0.556 | - | A |
| 5 | State College Boulevard at Birch Street | Signalized | ICU 1 | SB Thru | 0.772 | - | C |
| 6 | S Associated Road at Birch Street | Signalized | ICU 1 | EB Thru | 0.589 | - | A |
| 7 | Randolph Avenue at Madison Way | Signalized | ICU 1 | NB Thru | 0.341 | - | A |
| 8 | Randolph Avenue at Brea Mall | Signalized | ICU 1 | NB Thru | 0.519 | - | A |
| 9 | Brea Mall South at State College Boulevard | Signalized | ICU 1 | WB Thru | 0.650 | - | B |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | ICU 1 | EB Right | 0.884 | - | D |
| 11 | Puente Street at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.558 | - | A |
| 12 | Brea Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.867 | - | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.854 | - | D |
| 14 | State College Boulevard at Imperial Highway | Signalized | ICU 1 | NB Right | 1.318 | - | F |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.888 | - | D |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.955 | - | E |
| 17 | Associated Road at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.833 | - | D |
| 18 | Castlegate Lane/Placentia | Signalized | ICU 1 | WB Thru | 0.783 | | C |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.783 | - | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.822 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 154 | 290 | 408 | 574 | 406 | 5 | 20 | 1322 | 290 | 780 | 1745 | 789 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 154 | 290 | 408 | 574 | 406 | 5 | 20 | 1322 | 290 | 780 | 1745 | 789 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 39 | 73 | 102 | 144 | 102 | 1 | 5 | 331 | 73 | 195 | 436 | 197 |
| Total Analysis Volume [veh/h] | 154 | 290 | 408 | 574 | 406 | 5 | 20 | 1322 | 290 | 780 | 1745 | 789 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.05 | 0.14 | 0.14 | 0.17 | 0.12 | 0.12 | 0.01 | 0.24 | 0.24 | 0.23 | 0.34 | 0.30 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.822 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.837 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 900 | 0 | 1309 | 0 | 1680 | 609 | 246 | 2002 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 900 | 0 | 1309 | 0 | 1680 | 609 | 246 | 2002 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 225 | 0 | 327 | 0 | 420 | 152 | 62 | 501 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 900 | 0 | 1309 | 0 | 1680 | 609 | 246 | 2002 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.26 | 0.00 | 0.39 | 0.00 | 0.33 | 0.18 | 0.07 | 0.39 | 0.00 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.837 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.770 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1159 | 0 | 519 | 0 | 0 | 0 | 0 | 1827 | 752 | 0 | 1067 | 473 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1159 | 0 | 519 | 0 | 0 | 0 | 0 | 1827 | 752 | 0 | 1067 | 473 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 290 | 0 | 130 | 0 | 0 | 0 | 0 | 457 | 188 | 0 | 267 | 0 |
| Total Analysis Volume [veh/h] | 1159 | 0 | 519 | 0 | 0 | 0 | 0 | 1827 | 752 | 0 | 1067 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.34 | 0.00 | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | 0.38 | 0.00 | 0.21 | 0.00 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.770 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.556 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 107 | 81 | 192 | 63 | 39 | 92 | 93 | 739 | 134 | 168 | 895 | 27 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 107 | 81 | 192 | 63 | 39 | 92 | 93 | 739 | 134 | 168 | 895 | 27 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 27 | 20 | 48 | 16 | 10 | 23 | 23 | 185 | 34 | 42 | 224 | 7 |
| Total Analysis Volume [veh/h] | 107 | 81 | 192 | 63 | 39 | 92 | 93 | 739 | 134 | 168 | 895 | 27 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

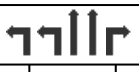
**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.06 | 0.05 | 0.11 | 0.04 | 0.08 | 0.08 | 0.05 | 0.26 | 0.26 | 0.10 | 0.26 | 0.02 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.556 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.772 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 165 | 340 | 207 | 301 | 645 | 531 | 321 | 825 | 180 | 183 | 794 | 270 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 165 | 340 | 207 | 301 | 645 | 531 | 321 | 825 | 180 | 183 | 794 | 270 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 41 | 85 | 52 | 75 | 161 | 133 | 80 | 206 | 45 | 46 | 199 | 68 |
| Total Analysis Volume [veh/h] | 165 | 340 | 207 | 301 | 645 | 531 | 321 | 825 | 180 | 183 | 794 | 270 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.05 | 0.10 | 0.12 | 0.09 | 0.35 | 0.35 | 0.09 | 0.24 | 0.11 | 0.05 | 0.23 | 0.16 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.772 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.589 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 358 | 21 | 179 | 13 | 23 | 17 | 11 | 861 | 371 | 161 | 856 | 15 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 358 | 21 | 179 | 13 | 23 | 17 | 11 | 861 | 371 | 161 | 856 | 15 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 90 | 5 | 45 | 3 | 6 | 4 | 3 | 215 | 93 | 40 | 214 | 4 |
| Total Analysis Volume [veh/h] | 358 | 21 | 179 | 13 | 23 | 17 | 11 | 861 | 371 | 161 | 856 | 15 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.11 | 0.01 | 0.06 | 0.01 | 0.02 | 0.02 | 0.01 | 0.36 | 0.36 | 0.05 | 0.26 | 0.26 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.589 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.341 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 23 | 395 | 120 | 76 | 280 | 25 | 40 | 12 | 63 | 87 | 4 | 60 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 23 | 395 | 120 | 76 | 280 | 25 | 40 | 12 | 63 | 87 | 4 | 60 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 6 | 99 | 30 | 19 | 70 | 6 | 10 | 3 | 16 | 22 | 1 | 15 |
| Total Analysis Volume [veh/h] | 23 | 395 | 120 | 76 | 280 | 25 | 40 | 12 | 63 | 87 | 4 | 60 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.15 | 0.15 | 0.04 | 0.09 | 0.09 | 0.02 | 0.04 | 0.04 | 0.05 | 0.04 | 0.04 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.341 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.519 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 26 | 467 | 453 | 45 | 336 | 23 | 25 | 16 | 28 | 415 | 6 | 82 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 26 | 467 | 453 | 45 | 336 | 23 | 25 | 16 | 28 | 415 | 6 | 82 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 117 | 113 | 11 | 84 | 6 | 6 | 4 | 7 | 104 | 2 | 21 |
| Total Analysis Volume [veh/h] | 26 | 467 | 453 | 45 | 336 | 23 | 25 | 16 | 28 | 415 | 6 | 82 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.27 | 0.27 | 0.03 | 0.11 | 0.11 | 0.01 | 0.02 | 0.02 | 0.12 | 0.20 | 0.20 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.519 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.650 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 184 | 34 | 99 | 65 | 29 | 555 | 711 | 511 | 41 | 93 | 674 | 38 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 184 | 34 | 99 | 65 | 29 | 555 | 711 | 511 | 41 | 93 | 674 | 38 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 46 | 9 | 25 | 16 | 7 | 139 | 178 | 128 | 10 | 23 | 169 | 10 |
| Total Analysis Volume [veh/h] | 184 | 34 | 99 | 65 | 29 | 555 | 711 | 511 | 41 | 93 | 674 | 38 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.05 | 0.06 | 0.06 | 0.04 | 0.02 | 0.12 | 0.21 | 0.16 | 0.16 | 0.05 | 0.21 | 0.21 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.650 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.884 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 719 | 989 | 282 | 246 | 896 | 315 | 371 | 1287 | 391 | 368 | 1390 | 231 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 719 | 989 | 282 | 246 | 896 | 315 | 371 | 1287 | 391 | 368 | 1390 | 231 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 180 | 247 | 71 | 62 | 224 | 79 | 93 | 322 | 98 | 92 | 348 | 58 |
| Total Analysis Volume [veh/h] | 719 | 989 | 282 | 246 | 896 | 315 | 371 | 1287 | 391 | 368 | 1390 | 231 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.21 | 0.19 | 0.17 | 0.07 | 0.18 | 0.19 | 0.11 | 0.33 | 0.33 | 0.11 | 0.27 | 0.14 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.884 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.558 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 28 | 33 | 107 | 184 | 46 | 134 | 86 | 1423 | 39 | 84 | 1461 | 242 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 28 | 33 | 107 | 184 | 46 | 134 | 86 | 1423 | 39 | 84 | 1461 | 242 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 8 | 27 | 46 | 12 | 34 | 22 | 356 | 10 | 21 | 365 | 61 |
| Total Analysis Volume [veh/h] | 28 | 33 | 107 | 184 | 46 | 134 | 86 | 1423 | 39 | 84 | 1461 | 242 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

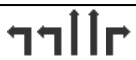
**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.02 | 0.06 | 0.11 | 0.01 | 0.08 | 0.05 | 0.29 | 0.29 | 0.05 | 0.29 | 0.14 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.558 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.867 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 451 | 669 | 300 | 490 | 984 | 274 | 296 | 1448 | 302 | 378 | 1479 | 435 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 451 | 669 | 300 | 490 | 984 | 274 | 296 | 1448 | 302 | 378 | 1479 | 435 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 113 | 167 | 75 | 123 | 246 | 69 | 74 | 362 | 76 | 95 | 370 | 109 |
| Total Analysis Volume [veh/h] | 451 | 669 | 300 | 490 | 984 | 274 | 296 | 1448 | 302 | 378 | 1479 | 435 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.13 | 0.13 | 0.18 | 0.14 | 0.29 | 0.16 | 0.09 | 0.28 | 0.18 | 0.11 | 0.29 | 0.26 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.867 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.854 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 107 | 49 | 209 | 441 | 90 | 314 | 338 | 1684 | 68 | 151 | 1996 | 497 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 107 | 49 | 209 | 441 | 90 | 314 | 338 | 1684 | 68 | 151 | 1996 | 497 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 27 | 12 | 52 | 110 | 23 | 79 | 85 | 421 | 17 | 38 | 499 | 124 |
| Total Analysis Volume [veh/h] | 107 | 49 | 209 | 441 | 90 | 314 | 338 | 1684 | 68 | 151 | 1996 | 497 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.06 | 0.08 | 0.08 | 0.13 | 0.24 | 0.24 | 0.10 | 0.34 | 0.34 | 0.09 | 0.39 | 0.29 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.854 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | F |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.318 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 326 | 655 | 780 | 617 | 442 | 195 | 146 | 1770 | 239 | 699 | 2190 | 1155 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 326 | 655 | 780 | 617 | 442 | 195 | 146 | 1770 | 239 | 699 | 2190 | 1155 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 82 | 164 | 195 | 154 | 111 | 49 | 37 | 443 | 60 | 175 | 548 | 289 |
| Total Analysis Volume [veh/h] | 326 | 655 | 780 | 617 | 442 | 195 | 146 | 1770 | 239 | 699 | 2190 | 1155 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.10 | 0.19 | 0.46 | 0.31 | 0.19 | 0.19 | 0.04 | 0.30 | 0.30 | 0.21 | 0.43 | 0.37 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | F | | | | | | | | | | | |
| Intersection V/C | 1.318 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.888 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 581 | 0 | 831 | 0 | 2335 | 1242 | 0 | 2860 | 367 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 581 | 0 | 831 | 0 | 2335 | 1242 | 0 | 2860 | 367 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 145 | 0 | 208 | 0 | 584 | 311 | 0 | 715 | 92 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 581 | 0 | 831 | 0 | 2335 | 1242 | 0 | 2860 | 367 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |

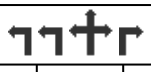
**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.17 | 0.00 | 0.28 | 0.00 | 0.46 | 0.00 | 0.00 | 0.56 | 0.00 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.888 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | E |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.955 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1568 | 117 | 638 | 0 | 0 | 371 | 388 | 2085 | 690 | 0 | 2220 | 60 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1568 | 117 | 638 | 0 | 0 | 371 | 388 | 2085 | 690 | 0 | 2220 | 60 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 392 | 29 | 160 | 0 | 0 | 93 | 97 | 521 | 173 | 0 | 555 | 15 |
| Total Analysis Volume [veh/h] | 1568 | 117 | 638 | 0 | 0 | 371 | 388 | 2085 | 690 | 0 | 2220 | 60 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.31 | 0.34 | 0.34 | 0.00 | 0.00 | 0.00 | 0.23 | 0.41 | 0.00 | 0.00 | 0.34 | 0.34 |
| Intersection LOS | E | | | | | | | | | | | |
| Intersection V/C | 0.955 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.833 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 260 | 198 | 141 | 320 | 254 | 203 | 253 | 2001 | 265 | 191 | 1835 | 227 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 260 | 198 | 141 | 320 | 254 | 203 | 253 | 2001 | 265 | 191 | 1835 | 227 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 65 | 50 | 35 | 80 | 64 | 51 | 63 | 500 | 66 | 48 | 459 | 57 |
| Total Analysis Volume [veh/h] | 260 | 198 | 141 | 320 | 254 | 203 | 253 | 2001 | 265 | 191 | 1835 | 227 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.08 | 0.10 | 0.10 | 0.09 | 0.15 | 0.12 | 0.15 | 0.44 | 0.44 | 0.11 | 0.30 | 0.30 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.833 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.783 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 206 | 18 | 276 | 28 | 12 | 13 | 26 | 2142 | 314 | 228 | 2171 | 50 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 206 | 18 | 276 | 28 | 12 | 13 | 26 | 2142 | 314 | 228 | 2171 | 50 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 52 | 5 | 69 | 7 | 3 | 3 | 7 | 536 | 79 | 57 | 543 | 13 |
| Total Analysis Volume [veh/h] | 206 | 18 | 276 | 28 | 12 | 13 | 26 | 2142 | 314 | 228 | 2171 | 50 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.06 | 0.07 | 0.16 | 0.02 | 0.01 | 0.01 | 0.02 | 0.42 | 0.18 | 0.13 | 0.44 | 0.44 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.783 | | | | | | | | | | | |

*APPENDIX C-VI*

# YEAR 2045 PLUS PROJECT TRAFFIC CONDITIONS

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 ICU Network.vistro
Report File: N:\...\AM 2045+P.pdf

Scenario 13 AM 2045+P
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | ICU 1 | WB Thru | 0.871 | - | D |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | ICU 1 | WB Thru | 0.836 | - | D |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | ICU 1 | EB Thru | 0.885 | - | D |
| 4 | Randolph Avenue at Birch Street | Signalized | ICU 1 | EB Thru | 0.435 | - | A |
| 5 | State College Boulevard at Birch Street | Signalized | ICU 1 | SB Thru | 0.673 | - | B |
| 6 | S Associated Road at Birch Street | Signalized | ICU 1 | EB Thru | 0.736 | - | C |
| 7 | Randolph Avenue at Madison Way | Signalized | ICU 1 | NB Thru | 0.154 | - | A |
| 8 | Randolph Avenue at Brea Mall | Signalized | ICU 1 | NB Thru | 0.203 | - | A |
| 9 | Brea Mall South at State College Boulevard | Signalized | ICU 1 | WB Thru | 0.277 | - | A |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | ICU 1 | EB Thru | 1.019 | - | F |
| 11 | Puente Street at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.780 | - | C |
| 12 | Brea Boulevard at Imperial Highway | Signalized | ICU 1 | SB Thru | 0.952 | - | E |
| 13 | Randolph Avenue at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.545 | - | A |
| 14 | State College Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.857 | - | D |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.732 | - | C |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | ICU 1 | NB Thru | 0.682 | - | B |
| 17 | Associated Road at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.839 | - | D |
| 18 | Castlegate Lane/Placentia | Signalized | ICU 1 | EB Thru | 0.721 | | C |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.721 | - | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.871 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 194 | 250 | 235 | 1011 | 691 | 9 | 16 | 1594 | 238 | 541 | 2035 | 627 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 194 | 250 | 235 | 1011 | 691 | 9 | 16 | 1594 | 238 | 541 | 2035 | 627 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 49 | 63 | 59 | 253 | 173 | 2 | 4 | 399 | 60 | 135 | 509 | 157 |
| Total Analysis Volume [veh/h] | 194 | 250 | 235 | 1011 | 691 | 9 | 16 | 1594 | 238 | 541 | 2035 | 627 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.06 | 0.10 | 0.10 | 0.30 | 0.21 | 0.21 | 0.00 | 0.27 | 0.27 | 0.16 | 0.40 | 0.07 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.871 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.836 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 1084 | 0 | 730 | 0 | 1953 | 650 | 285 | 2286 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 1084 | 0 | 730 | 0 | 1953 | 650 | 285 | 2286 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 271 | 0 | 183 | 0 | 488 | 163 | 71 | 572 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 1084 | 0 | 730 | 0 | 1953 | 650 | 285 | 2286 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.32 | 0.00 | 0.21 | 0.00 | 0.38 | 0.19 | 0.08 | 0.45 | 0.00 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.836 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.885 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1104 | 0 | 534 | 0 | 0 | 0 | 0 | 2605 | 424 | 0 | 1458 | 530 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1104 | 0 | 534 | 0 | 0 | 0 | 0 | 2605 | 424 | 0 | 1458 | 530 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 276 | 0 | 134 | 0 | 0 | 0 | 0 | 651 | 106 | 0 | 365 | 0 |
| Total Analysis Volume [veh/h] | 1104 | 0 | 534 | 0 | 0 | 0 | 0 | 2605 | 424 | 0 | 1458 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.32 | 0.00 | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.51 | 0.25 | 0.00 | 0.29 | 0.00 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.885 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.435 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 36 | 46 | 101 | 86 | 39 | 37 | 43 | 656 | 108 | 85 | 597 | 61 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 36 | 46 | 101 | 86 | 39 | 37 | 43 | 656 | 108 | 85 | 597 | 61 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 9 | 12 | 25 | 22 | 10 | 9 | 11 | 164 | 27 | 21 | 149 | 15 |
| Total Analysis Volume [veh/h] | 36 | 46 | 101 | 86 | 39 | 37 | 43 | 656 | 108 | 85 | 597 | 61 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.02 | 0.03 | 0.06 | 0.05 | 0.04 | 0.04 | 0.03 | 0.22 | 0.22 | 0.05 | 0.18 | 0.04 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.435 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.673 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 88 | 176 | 118 | 776 | 974 | 254 | 125 | 582 | 68 | 104 | 664 | 338 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 88 | 176 | 118 | 776 | 974 | 254 | 125 | 582 | 68 | 104 | 664 | 338 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 22 | 44 | 30 | 194 | 244 | 64 | 31 | 146 | 17 | 26 | 166 | 85 |
| Total Analysis Volume [veh/h] | 88 | 176 | 118 | 776 | 974 | 254 | 125 | 582 | 68 | 104 | 664 | 338 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.03 | 0.05 | 0.07 | 0.23 | 0.36 | 0.36 | 0.04 | 0.17 | 0.04 | 0.03 | 0.20 | 0.20 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.673 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.736 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 286 | 7 | 364 | 63 | 34 | 11 | 5 | 1105 | 374 | 405 | 898 | 11 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 286 | 7 | 364 | 63 | 34 | 11 | 5 | 1105 | 374 | 405 | 898 | 11 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 72 | 2 | 91 | 16 | 9 | 3 | 1 | 276 | 94 | 101 | 225 | 3 |
| Total Analysis Volume [veh/h] | 286 | 7 | 364 | 63 | 34 | 11 | 5 | 1105 | 374 | 405 | 898 | 11 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.08 | 0.00 | 0.10 | 0.04 | 0.03 | 0.03 | 0.00 | 0.44 | 0.44 | 0.12 | 0.27 | 0.27 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.736 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.154 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 28 | 161 | 9 | 6 | 148 | 18 | 36 | 3 | 62 | 0 | 0 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 28 | 161 | 9 | 6 | 148 | 18 | 36 | 3 | 62 | 0 | 0 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 40 | 2 | 2 | 37 | 5 | 9 | 1 | 16 | 0 | 0 | 0 |
| Total Analysis Volume [veh/h] | 28 | 161 | 9 | 6 | 148 | 18 | 36 | 3 | 62 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.05 | 0.05 | 0.00 | 0.05 | 0.05 | 0.02 | 0.04 | 0.04 | 0.00 | 0.00 | 0.00 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.154 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.203 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 14 | 190 | 132 | 28 | 166 | 6 | 1 | 0 | 1 | 117 | 0 | 22 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 14 | 190 | 132 | 28 | 166 | 6 | 1 | 0 | 1 | 117 | 0 | 22 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 48 | 33 | 7 | 42 | 2 | 0 | 0 | 0 | 29 | 0 | 6 |
| Total Analysis Volume [veh/h] | 14 | 190 | 132 | 28 | 166 | 6 | 1 | 0 | 1 | 117 | 0 | 22 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.09 | 0.09 | 0.02 | 0.05 | 0.05 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.05 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.203 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.277 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 34 | 9 | 17 | 17 | 6 | 67 | 153 | 283 | 17 | 30 | 512 | 29 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 34 | 9 | 17 | 17 | 6 | 67 | 153 | 283 | 17 | 30 | 512 | 29 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 9 | 2 | 4 | 4 | 2 | 17 | 38 | 71 | 4 | 8 | 128 | 7 |
| Total Analysis Volume [veh/h] | 34 | 9 | 17 | 17 | 6 | 67 | 153 | 283 | 17 | 30 | 512 | 29 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.05 | 0.09 | 0.09 | 0.02 | 0.16 | 0.16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.277 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | F |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.019 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 387 | 773 | 293 | 184 | 1484 | 334 | 303 | 1482 | 759 | 424 | 1327 | 279 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 387 | 773 | 293 | 184 | 1484 | 334 | 303 | 1482 | 759 | 424 | 1327 | 279 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 97 | 193 | 73 | 46 | 371 | 84 | 76 | 371 | 190 | 106 | 332 | 70 |
| Total Analysis Volume [veh/h] | 387 | 773 | 293 | 184 | 1484 | 334 | 303 | 1482 | 759 | 424 | 1327 | 279 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.11 | 0.15 | 0.17 | 0.05 | 0.29 | 0.20 | 0.09 | 0.44 | 0.44 | 0.12 | 0.26 | 0.16 |
| Intersection LOS | F | | | | | | | | | | | |
| Intersection V/C | 1.019 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.780 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 64 | 124 | 169 | 300 | 121 | 263 | 246 | 1472 | 85 | 56 | 1577 | 195 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 64 | 124 | 169 | 300 | 121 | 263 | 246 | 1472 | 85 | 56 | 1577 | 195 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 16 | 31 | 42 | 75 | 30 | 66 | 62 | 368 | 21 | 14 | 394 | 49 |
| Total Analysis Volume [veh/h] | 64 | 124 | 169 | 300 | 121 | 263 | 246 | 1472 | 85 | 56 | 1577 | 195 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

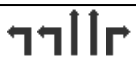
**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.04 | 0.07 | 0.10 | 0.18 | 0.04 | 0.15 | 0.14 | 0.31 | 0.31 | 0.03 | 0.31 | 0.11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.780 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | E |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.952 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 473 | 581 | 203 | 181 | 1222 | 228 | 177 | 1715 | 395 | 223 | 1790 | 122 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 473 | 581 | 203 | 181 | 1222 | 228 | 177 | 1715 | 395 | 223 | 1790 | 122 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 118 | 145 | 51 | 45 | 306 | 57 | 44 | 429 | 99 | 56 | 448 | 31 |
| Total Analysis Volume [veh/h] | 473 | 581 | 203 | 181 | 1222 | 228 | 177 | 1715 | 395 | 223 | 1790 | 122 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.14 | 0.11 | 0.12 | 0.05 | 0.36 | 0.13 | 0.05 | 0.34 | 0.23 | 0.07 | 0.35 | 0.07 |
| Intersection LOS | E | | | | | | | | | | | |
| Intersection V/C | 0.952 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.545 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 39 | 20 | 71 | 192 | 22 | 78 | 138 | 1742 | 27 | 43 | 1882 | 182 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 39 | 20 | 71 | 192 | 22 | 78 | 138 | 1742 | 27 | 43 | 1882 | 182 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 10 | 5 | 18 | 48 | 6 | 20 | 35 | 436 | 7 | 11 | 471 | 46 |
| Total Analysis Volume [veh/h] | 39 | 20 | 71 | 192 | 22 | 78 | 138 | 1742 | 27 | 43 | 1882 | 182 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

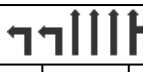
**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.03 | 0.03 | 0.06 | 0.06 | 0.06 | 0.04 | 0.35 | 0.35 | 0.03 | 0.37 | 0.11 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.545 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.857 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 125 | 186 | 479 | 151 | 502 | 33 | 37 | 1775 | 214 | 534 | 1953 | 203 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 125 | 186 | 479 | 151 | 502 | 33 | 37 | 1775 | 214 | 534 | 1953 | 203 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 31 | 47 | 120 | 38 | 126 | 8 | 9 | 444 | 54 | 134 | 488 | 51 |
| Total Analysis Volume [veh/h] | 125 | 186 | 479 | 151 | 502 | 33 | 37 | 1775 | 214 | 534 | 1953 | 203 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.05 | 0.28 | 0.08 | 0.16 | 0.16 | 0.01 | 0.29 | 0.29 | 0.16 | 0.38 | 0.04 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.857 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.732 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 684 | 0 | 571 | 0 | 1739 | 828 | 0 | 2223 | 232 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 684 | 0 | 571 | 0 | 1739 | 828 | 0 | 2223 | 232 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 171 | 0 | 143 | 0 | 435 | 207 | 0 | 556 | 58 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 684 | 0 | 571 | 0 | 1739 | 828 | 0 | 2223 | 232 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |

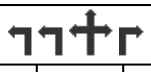
**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.25 | 0.00 | 0.34 | 0.00 | 0.00 | 0.44 | 0.00 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.732 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.682 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1149 | 31 | 949 | 0 | 0 | 87 | 100 | 1552 | 635 | 0 | 1752 | 14 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1149 | 31 | 949 | 0 | 0 | 87 | 100 | 1552 | 635 | 0 | 1752 | 14 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 287 | 8 | 237 | 0 | 0 | 22 | 25 | 388 | 159 | 0 | 438 | 4 |
| Total Analysis Volume [veh/h] | 1149 | 31 | 949 | 0 | 0 | 87 | 100 | 1552 | 635 | 0 | 1752 | 14 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.23 | 0.31 | 0.31 | 0.00 | 0.00 | 0.00 | 0.06 | 0.30 | 0.00 | 0.00 | 0.26 | 0.26 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.682 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.839 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 171 | 241 | 94 | 190 | 382 | 185 | 238 | 2193 | 117 | 104 | 1817 | 112 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 171 | 241 | 94 | 190 | 382 | 185 | 238 | 2193 | 117 | 104 | 1817 | 112 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 43 | 60 | 24 | 48 | 96 | 46 | 60 | 548 | 29 | 26 | 454 | 28 |
| Total Analysis Volume [veh/h] | 171 | 241 | 94 | 190 | 382 | 185 | 238 | 2193 | 117 | 104 | 1817 | 112 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.05 | 0.10 | 0.10 | 0.06 | 0.22 | 0.11 | 0.14 | 0.45 | 0.45 | 0.06 | 0.28 | 0.28 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.839 | | | | | | | | | | | |

**Intersection Level Of Service Report**

**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.721 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 201 | 14 | 167 | 28 | 33 | 16 | 14 | 2169 | 487 | 201 | 1755 | 37 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 201 | 14 | 167 | 28 | 33 | 16 | 14 | 2169 | 487 | 201 | 1755 | 37 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 50 | 4 | 42 | 7 | 8 | 4 | 4 | 542 | 122 | 50 | 439 | 9 |
| Total Analysis Volume [veh/h] | 201 | 14 | 167 | 28 | 33 | 16 | 14 | 2169 | 487 | 201 | 1755 | 37 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.06 | 0.06 | 0.10 | 0.02 | 0.03 | 0.03 | 0.01 | 0.43 | 0.29 | 0.12 | 0.35 | 0.35 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.721 | | | | | | | | | | | |

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 ICU Network.vistro
Report File: N:\...\PM 2045+P.pdf

Scenario 14 PM 2045+P
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | ICU 1 | EB Thru | 0.868 | - | D |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | ICU 1 | WB Thru | 0.692 | - | B |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | ICU 1 | EB Thru | 0.588 | - | A |
| 4 | Randolph Avenue at Birch Street | Signalized | ICU 1 | WB Thru | 0.647 | - | B |
| 5 | State College Boulevard at Birch Street | Signalized | ICU 1 | WB Right | 0.864 | - | D |
| 6 | S Associated Road at Birch Street | Signalized | ICU 1 | WB Thru | 0.741 | - | C |
| 7 | Randolph Avenue at Madison Way | Signalized | ICU 1 | NB Thru | 0.270 | - | A |
| 8 | Randolph Avenue at Brea Mall | Signalized | ICU 1 | NB Thru | 0.444 | - | A |
| 9 | Brea Mall South at State College Boulevard | Signalized | ICU 1 | EB Left | 0.512 | - | A |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | ICU 1 | EB Thru | 1.026 | - | F |
| 11 | Puente Street at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.712 | - | C |
| 12 | Brea Boulevard at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.889 | - | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.765 | - | C |
| 14 | State College Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 1.040 | - | F |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.855 | - | D |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.829 | - | D |
| 17 | Associated Road at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.940 | - | E |
| 18 | Castlegate Lane/Placentia | Signalized | ICU 1 | WB Thru | 0.844 | | D |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.844 | - | D |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.868 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 368 | 687 | 349 | 637 | 459 | 17 | 44 | 1694 | 302 | 454 | 1361 | 801 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 368 | 687 | 349 | 637 | 459 | 17 | 44 | 1694 | 302 | 454 | 1361 | 801 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 92 | 172 | 87 | 159 | 115 | 4 | 11 | 424 | 76 | 114 | 340 | 200 |
| Total Analysis Volume [veh/h] | 368 | 687 | 349 | 637 | 459 | 17 | 44 | 1694 | 302 | 454 | 1361 | 801 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.11 | 0.20 | 0.20 | 0.19 | 0.14 | 0.14 | 0.01 | 0.29 | 0.29 | 0.13 | 0.27 | 0.28 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.868 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.692 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 497 | 0 | 895 | 0 | 1512 | 877 | 280 | 1836 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 497 | 0 | 895 | 0 | 1512 | 877 | 280 | 1836 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 124 | 0 | 224 | 0 | 378 | 219 | 70 | 459 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 497 | 0 | 895 | 0 | 1512 | 877 | 280 | 1836 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.15 | 0.00 | 0.26 | 0.00 | 0.30 | 0.26 | 0.08 | 0.36 | 0.00 |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.692 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.588 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 710 | 0 | 330 | 0 | 0 | 0 | 0 | 1638 | 602 | 0 | 1203 | 571 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 710 | 0 | 330 | 0 | 0 | 0 | 0 | 1638 | 602 | 0 | 1203 | 571 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 178 | 0 | 83 | 0 | 0 | 0 | 0 | 410 | 151 | 0 | 301 | 0 |
| Total Analysis Volume [veh/h] | 710 | 0 | 330 | 0 | 0 | 0 | 0 | 1638 | 602 | 0 | 1203 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.21 | 0.00 | 0.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 | 0.33 | 0.00 | 0.24 | 0.00 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.588 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.647 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 148 | 76 | 187 | 55 | 54 | 112 | 93 | 770 | 117 | 208 | 1215 | 49 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 148 | 76 | 187 | 55 | 54 | 112 | 93 | 770 | 117 | 208 | 1215 | 49 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 37 | 19 | 47 | 14 | 14 | 28 | 23 | 193 | 29 | 52 | 304 | 12 |
| Total Analysis Volume [veh/h] | 148 | 76 | 187 | 55 | 54 | 112 | 93 | 770 | 117 | 208 | 1215 | 49 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.09 | 0.04 | 0.11 | 0.03 | 0.10 | 0.10 | 0.05 | 0.26 | 0.26 | 0.12 | 0.36 | 0.03 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.647 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.864 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 157 | 473 | 184 | 393 | 430 | 363 | 320 | 893 | 182 | 170 | 1140 | 749 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 157 | 473 | 184 | 393 | 430 | 363 | 320 | 893 | 182 | 170 | 1140 | 749 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 39 | 118 | 46 | 98 | 108 | 91 | 80 | 223 | 46 | 43 | 285 | 187 |
| Total Analysis Volume [veh/h] | 157 | 473 | 184 | 393 | 430 | 363 | 320 | 893 | 182 | 170 | 1140 | 749 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.05 | 0.14 | 0.11 | 0.12 | 0.23 | 0.23 | 0.09 | 0.26 | 0.11 | 0.05 | 0.34 | 0.44 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.864 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.741 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 559 | 37 | 403 | 11 | 23 | 11 | 17 | 1042 | 349 | 332 | 1472 | 19 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 559 | 37 | 403 | 11 | 23 | 11 | 17 | 1042 | 349 | 332 | 1472 | 19 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 140 | 9 | 101 | 3 | 6 | 3 | 4 | 261 | 87 | 83 | 368 | 5 |
| Total Analysis Volume [veh/h] | 559 | 37 | 403 | 11 | 23 | 11 | 17 | 1042 | 349 | 332 | 1472 | 19 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.16 | 0.02 | 0.14 | 0.01 | 0.02 | 0.02 | 0.01 | 0.41 | 0.41 | 0.10 | 0.44 | 0.44 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.741 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.270 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 48 | 368 | 45 | 29 | 290 | 32 | 68 | 4 | 55 | 79 | 4 | 38 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 48 | 368 | 45 | 29 | 290 | 32 | 68 | 4 | 55 | 79 | 4 | 38 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 12 | 92 | 11 | 7 | 73 | 8 | 17 | 1 | 14 | 20 | 1 | 10 |
| Total Analysis Volume [veh/h] | 48 | 368 | 45 | 29 | 290 | 32 | 68 | 4 | 55 | 79 | 4 | 38 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.03 | 0.12 | 0.12 | 0.02 | 0.09 | 0.09 | 0.04 | 0.03 | 0.03 | 0.05 | 0.02 | 0.02 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.270 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.444 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 17 | 367 | 430 | 56 | 392 | 21 | 18 | 3 | 12 | 328 | 3 | 57 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 17 | 367 | 430 | 56 | 392 | 21 | 18 | 3 | 12 | 328 | 3 | 57 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 92 | 108 | 14 | 98 | 5 | 5 | 1 | 3 | 82 | 1 | 14 |
| Total Analysis Volume [veh/h] | 17 | 367 | 430 | 56 | 392 | 21 | 18 | 3 | 12 | 328 | 3 | 57 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.23 | 0.23 | 0.03 | 0.12 | 0.12 | 0.01 | 0.01 | 0.01 | 0.10 | 0.15 | 0.15 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.444 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.512 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 151 | 26 | 67 | 56 | 20 | 428 | 620 | 595 | 23 | 104 | 490 | 49 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 151 | 26 | 67 | 56 | 20 | 428 | 620 | 595 | 23 | 104 | 490 | 49 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 38 | 7 | 17 | 14 | 5 | 107 | 155 | 149 | 6 | 26 | 123 | 12 |
| Total Analysis Volume [veh/h] | 151 | 26 | 67 | 56 | 20 | 428 | 620 | 595 | 23 | 104 | 490 | 49 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.05 | 0.04 | 0.03 | 0.01 | 0.07 | 0.18 | 0.18 | 0.18 | 0.06 | 0.16 | 0.16 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.512 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | F |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.026 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 786 | 1305 | 282 | 294 | 1020 | 439 | 336 | 1381 | 417 | 455 | 1699 | 301 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 786 | 1305 | 282 | 294 | 1020 | 439 | 336 | 1381 | 417 | 455 | 1699 | 301 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 197 | 326 | 71 | 74 | 255 | 110 | 84 | 345 | 104 | 114 | 425 | 75 |
| Total Analysis Volume [veh/h] | 786 | 1305 | 282 | 294 | 1020 | 439 | 336 | 1381 | 417 | 455 | 1699 | 301 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.23 | 0.26 | 0.17 | 0.09 | 0.20 | 0.26 | 0.10 | 0.35 | 0.35 | 0.13 | 0.33 | 0.18 |
| Intersection LOS | F | | | | | | | | | | | |
| Intersection V/C | 1.026 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.712 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 38 | 51 | 93 | 243 | 113 | 228 | 146 | 1729 | 40 | 114 | 1930 | 401 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 38 | 51 | 93 | 243 | 113 | 228 | 146 | 1729 | 40 | 114 | 1930 | 401 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 10 | 13 | 23 | 61 | 28 | 57 | 37 | 432 | 10 | 29 | 483 | 100 |
| Total Analysis Volume [veh/h] | 38 | 51 | 93 | 243 | 113 | 228 | 146 | 1729 | 40 | 114 | 1930 | 401 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

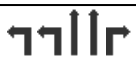
**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.03 | 0.05 | 0.14 | 0.03 | 0.13 | 0.09 | 0.35 | 0.35 | 0.07 | 0.38 | 0.24 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.712 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.889 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 553 | 989 | 319 | 277 | 712 | 234 | 263 | 1965 | 455 | 277 | 1884 | 207 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 553 | 989 | 319 | 277 | 712 | 234 | 263 | 1965 | 455 | 277 | 1884 | 207 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 138 | 247 | 80 | 69 | 178 | 59 | 66 | 491 | 114 | 69 | 471 | 52 |
| Total Analysis Volume [veh/h] | 553 | 989 | 319 | 277 | 712 | 234 | 263 | 1965 | 455 | 277 | 1884 | 207 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.16 | 0.19 | 0.19 | 0.08 | 0.21 | 0.14 | 0.08 | 0.39 | 0.27 | 0.08 | 0.37 | 0.12 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.889 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.765 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 61 | 41 | 72 | 369 | 32 | 250 | 333 | 1903 | 47 | 77 | 2114 | 385 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 61 | 41 | 72 | 369 | 32 | 250 | 333 | 1903 | 47 | 77 | 2114 | 385 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 15 | 10 | 18 | 92 | 8 | 63 | 83 | 476 | 12 | 19 | 529 | 96 |
| Total Analysis Volume [veh/h] | 61 | 41 | 72 | 369 | 32 | 250 | 333 | 1903 | 47 | 77 | 2114 | 385 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.02 | 0.03 | 0.03 | 0.11 | 0.17 | 0.17 | 0.10 | 0.38 | 0.38 | 0.05 | 0.41 | 0.23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.765 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | F |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.040 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 391 | 655 | 471 | 481 | 339 | 103 | 118 | 2096 | 122 | 497 | 2061 | 591 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 391 | 655 | 471 | 481 | 339 | 103 | 118 | 2096 | 122 | 497 | 2061 | 591 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 98 | 164 | 118 | 120 | 85 | 26 | 30 | 524 | 31 | 124 | 515 | 148 |
| Total Analysis Volume [veh/h] | 391 | 655 | 471 | 481 | 339 | 103 | 118 | 2096 | 122 | 497 | 2061 | 591 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.12 | 0.19 | 0.28 | 0.24 | 0.13 | 0.13 | 0.03 | 0.33 | 0.33 | 0.15 | 0.40 | 0.11 |
| Intersection LOS | F | | | | | | | | | | | |
| Intersection V/C | 1.040 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.855 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 764 | 0 | 614 | 0 | 1913 | 1142 | 0 | 2727 | 475 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 764 | 0 | 614 | 0 | 1913 | 1142 | 0 | 2727 | 475 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 191 | 0 | 154 | 0 | 478 | 286 | 0 | 682 | 119 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 764 | 0 | 614 | 0 | 1913 | 1142 | 0 | 2727 | 475 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |

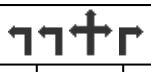
**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.22 | 0.00 | 0.27 | 0.00 | 0.38 | 0.00 | 0.00 | 0.53 | 0.00 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.855 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.829 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1151 | 64 | 506 | 0 | 0 | 193 | 183 | 2129 | 425 | 0 | 2807 | 38 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1151 | 64 | 506 | 0 | 0 | 193 | 183 | 2129 | 425 | 0 | 2807 | 38 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 288 | 16 | 127 | 0 | 0 | 48 | 46 | 532 | 106 | 0 | 702 | 10 |
| Total Analysis Volume [veh/h] | 1151 | 64 | 506 | 0 | 0 | 193 | 183 | 2129 | 425 | 0 | 2807 | 38 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.23 | 0.25 | 0.25 | 0.00 | 0.00 | 0.00 | 0.11 | 0.42 | 0.00 | 0.00 | 0.42 | 0.42 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.829 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | E |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.940 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 250 | 299 | 102 | 335 | 402 | 292 | 310 | 2167 | 160 | 210 | 1992 | 213 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 250 | 299 | 102 | 335 | 402 | 292 | 310 | 2167 | 160 | 210 | 1992 | 213 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 63 | 75 | 26 | 84 | 101 | 73 | 78 | 542 | 40 | 53 | 498 | 53 |
| Total Analysis Volume [veh/h] | 250 | 299 | 102 | 335 | 402 | 292 | 310 | 2167 | 160 | 210 | 1992 | 213 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.07 | 0.12 | 0.12 | 0.10 | 0.24 | 0.17 | 0.18 | 0.46 | 0.46 | 0.12 | 0.32 | 0.32 |
| Intersection LOS | E | | | | | | | | | | | |
| Intersection V/C | 0.940 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.844 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 290 | 54 | 310 | 29 | 26 | 16 | 22 | 2188 | 318 | 268 | 2258 | 66 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 290 | 54 | 310 | 29 | 26 | 16 | 22 | 2188 | 318 | 268 | 2258 | 66 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 73 | 14 | 78 | 7 | 7 | 4 | 6 | 547 | 80 | 67 | 565 | 17 |
| Total Analysis Volume [veh/h] | 290 | 54 | 310 | 29 | 26 | 16 | 22 | 2188 | 318 | 268 | 2258 | 66 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.09 | 0.10 | 0.18 | 0.02 | 0.02 | 0.02 | 0.01 | 0.43 | 0.19 | 0.16 | 0.46 | 0.46 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.844 | | | | | | | | | | | |

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 ICU Network.vistro
Report File: N:\...\Sat 2045+P.pdf

Scenario 15 Sat MD 2045+P
4/18/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | ICU 1 | WB Thru | 0.826 | - | D |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | ICU 1 | WB Thru | 0.839 | - | D |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | ICU 1 | EB Thru | 0.772 | - | C |
| 4 | Randolph Avenue at Birch Street | Signalized | ICU 1 | WB Thru | 0.559 | - | A |
| 5 | State College Boulevard at Birch Street | Signalized | ICU 1 | SB Thru | 0.774 | - | C |
| 6 | S Associated Road at Birch Street | Signalized | ICU 1 | EB Thru | 0.590 | - | A |
| 7 | Randolph Avenue at Madison Way | Signalized | ICU 1 | NB Right | 0.346 | - | A |
| 8 | Randolph Avenue at Brea Mall | Signalized | ICU 1 | NB Thru | 0.566 | - | A |
| 9 | Brea Mall South at State College Boulevard | Signalized | ICU 1 | EB Left | 0.700 | - | C |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.885 | - | D |
| 11 | Puente Street at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.565 | - | A |
| 12 | Brea Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.875 | - | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.892 | - | D |
| 14 | State College Boulevard at Imperial Highway | Signalized | ICU 1 | NB Right | 1.352 | - | F |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.895 | - | D |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.960 | - | E |
| 17 | Associated Road at Imperial Highway | Signalized | ICU 1 | EB Thru | 0.840 | - | D |
| 18 | Castlegate Lane/Placentia | Signalized | ICU 1 | WB Thru | 0.787 | | C |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.767 | - | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.826 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 154 | 294 | 417 | 574 | 408 | 5 | 20 | 1322 | 290 | 784 | 1745 | 789 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 154 | 294 | 417 | 574 | 408 | 5 | 20 | 1322 | 290 | 784 | 1745 | 789 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 39 | 74 | 104 | 144 | 102 | 1 | 5 | 331 | 73 | 196 | 436 | 197 |
| Total Analysis Volume [veh/h] | 154 | 294 | 417 | 574 | 408 | 5 | 20 | 1322 | 290 | 784 | 1745 | 789 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.05 | 0.14 | 0.14 | 0.17 | 0.12 | 0.12 | 0.01 | 0.24 | 0.24 | 0.23 | 0.34 | 0.30 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.826 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.839 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 900 | 0 | 1311 | 0 | 1689 | 609 | 246 | 2003 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 900 | 0 | 1311 | 0 | 1689 | 609 | 246 | 2003 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 225 | 0 | 328 | 0 | 422 | 152 | 62 | 501 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 900 | 0 | 1311 | 0 | 1689 | 609 | 246 | 2003 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.26 | 0.00 | 0.39 | 0.00 | 0.33 | 0.18 | 0.07 | 0.39 | 0.00 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.839 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.772 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1159 | 0 | 519 | 0 | 0 | 0 | 0 | 1831 | 758 | 0 | 1068 | 473 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1159 | 0 | 519 | 0 | 0 | 0 | 0 | 1831 | 758 | 0 | 1068 | 473 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 290 | 0 | 130 | 0 | 0 | 0 | 0 | 458 | 190 | 0 | 267 | 0 |
| Total Analysis Volume [veh/h] | 1159 | 0 | 519 | 0 | 0 | 0 | 0 | 1831 | 758 | 0 | 1068 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.34 | 0.00 | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | 0.38 | 0.00 | 0.21 | 0.00 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.772 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.559 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 120 | 82 | 194 | 63 | 40 | 92 | 93 | 739 | 140 | 169 | 895 | 27 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 120 | 82 | 194 | 63 | 40 | 92 | 93 | 739 | 140 | 169 | 895 | 27 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 30 | 21 | 49 | 16 | 10 | 23 | 23 | 185 | 35 | 42 | 224 | 7 |
| Total Analysis Volume [veh/h] | 120 | 82 | 194 | 63 | 40 | 92 | 93 | 739 | 140 | 169 | 895 | 27 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

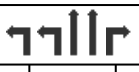
**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.07 | 0.05 | 0.11 | 0.04 | 0.08 | 0.08 | 0.05 | 0.26 | 0.26 | 0.10 | 0.26 | 0.02 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.559 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.774 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 165 | 353 | 212 | 301 | 651 | 531 | 321 | 827 | 180 | 185 | 795 | 270 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 165 | 353 | 212 | 301 | 651 | 531 | 321 | 827 | 180 | 185 | 795 | 270 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 41 | 88 | 53 | 75 | 163 | 133 | 80 | 207 | 45 | 46 | 199 | 68 |
| Total Analysis Volume [veh/h] | 165 | 353 | 212 | 301 | 651 | 531 | 321 | 827 | 180 | 185 | 795 | 270 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.05 | 0.10 | 0.12 | 0.09 | 0.35 | 0.35 | 0.09 | 0.24 | 0.11 | 0.05 | 0.23 | 0.16 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.774 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.590 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 358 | 21 | 179 | 13 | 23 | 17 | 11 | 867 | 371 | 161 | 860 | 15 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 358 | 21 | 179 | 13 | 23 | 17 | 11 | 867 | 371 | 161 | 860 | 15 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 90 | 5 | 45 | 3 | 6 | 4 | 3 | 217 | 93 | 40 | 215 | 4 |
| Total Analysis Volume [veh/h] | 358 | 21 | 179 | 13 | 23 | 17 | 11 | 867 | 371 | 161 | 860 | 15 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.11 | 0.01 | 0.06 | 0.01 | 0.02 | 0.02 | 0.01 | 0.36 | 0.36 | 0.05 | 0.26 | 0.26 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.590 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.346 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 23 | 410 | 120 | 76 | 288 | 25 | 40 | 12 | 63 | 87 | 4 | 60 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 23 | 410 | 120 | 76 | 288 | 25 | 40 | 12 | 63 | 87 | 4 | 60 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 6 | 103 | 30 | 19 | 72 | 6 | 10 | 3 | 16 | 22 | 1 | 15 |
| Total Analysis Volume [veh/h] | 23 | 410 | 120 | 76 | 288 | 25 | 40 | 12 | 63 | 87 | 4 | 60 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.01 | 0.16 | 0.16 | 0.04 | 0.09 | 0.09 | 0.02 | 0.04 | 0.04 | 0.05 | 0.04 | 0.04 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.346 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.566 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 26 | 464 | 501 | 54 | 335 | 23 | 25 | 16 | 28 | 494 | 6 | 100 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 26 | 464 | 501 | 54 | 335 | 23 | 25 | 16 | 28 | 494 | 6 | 100 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 116 | 125 | 14 | 84 | 6 | 6 | 4 | 7 | 124 | 2 | 25 |
| Total Analysis Volume [veh/h] | 26 | 464 | 501 | 54 | 335 | 23 | 25 | 16 | 28 | 494 | 6 | 100 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.28 | 0.28 | 0.03 | 0.11 | 0.11 | 0.01 | 0.02 | 0.02 | 0.15 | 0.24 | 0.24 |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.566 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.700 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 184 | 34 | 99 | 88 | 29 | 636 | 743 | 506 | 41 | 93 | 673 | 47 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 184 | 34 | 99 | 88 | 29 | 636 | 743 | 506 | 41 | 93 | 673 | 47 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 46 | 9 | 25 | 22 | 7 | 159 | 186 | 127 | 10 | 23 | 168 | 12 |
| Total Analysis Volume [veh/h] | 184 | 34 | 99 | 88 | 29 | 636 | 743 | 506 | 41 | 93 | 673 | 47 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.05 | 0.06 | 0.06 | 0.05 | 0.02 | 0.16 | 0.22 | 0.16 | 0.16 | 0.05 | 0.21 | 0.21 |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.700 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.885 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 719 | 989 | 282 | 248 | 896 | 315 | 371 | 1294 | 391 | 368 | 1407 | 236 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 719 | 989 | 282 | 248 | 896 | 315 | 371 | 1294 | 391 | 368 | 1407 | 236 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 180 | 247 | 71 | 62 | 224 | 79 | 93 | 324 | 98 | 92 | 352 | 59 |
| Total Analysis Volume [veh/h] | 719 | 989 | 282 | 248 | 896 | 315 | 371 | 1294 | 391 | 368 | 1407 | 236 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.21 | 0.19 | 0.17 | 0.07 | 0.18 | 0.19 | 0.11 | 0.33 | 0.33 | 0.11 | 0.28 | 0.14 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.885 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.565 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 28 | 33 | 109 | 186 | 46 | 134 | 86 | 1433 | 39 | 88 | 1484 | 248 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 28 | 33 | 109 | 186 | 46 | 134 | 86 | 1433 | 39 | 88 | 1484 | 248 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 8 | 27 | 47 | 12 | 34 | 22 | 358 | 10 | 22 | 371 | 62 |
| Total Analysis Volume [veh/h] | 28 | 33 | 109 | 186 | 46 | 134 | 86 | 1433 | 39 | 88 | 1484 | 248 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

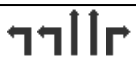
**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.02 | 0.02 | 0.06 | 0.11 | 0.01 | 0.08 | 0.05 | 0.29 | 0.29 | 0.05 | 0.29 | 0.15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.565 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.875 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 451 | 669 | 307 | 490 | 984 | 274 | 296 | 1462 | 302 | 396 | 1512 | 435 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 451 | 669 | 307 | 490 | 984 | 274 | 296 | 1462 | 302 | 396 | 1512 | 435 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 113 | 167 | 77 | 123 | 246 | 69 | 74 | 366 | 76 | 99 | 378 | 109 |
| Total Analysis Volume [veh/h] | 451 | 669 | 307 | 490 | 984 | 274 | 296 | 1462 | 302 | 396 | 1512 | 435 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.13 | 0.13 | 0.18 | 0.14 | 0.29 | 0.16 | 0.09 | 0.29 | 0.18 | 0.12 | 0.30 | 0.26 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.875 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.892 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 107 | 49 | 209 | 467 | 90 | 367 | 360 | 1684 | 68 | 151 | 1996 | 520 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 107 | 49 | 209 | 467 | 90 | 367 | 360 | 1684 | 68 | 151 | 1996 | 520 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 27 | 12 | 52 | 117 | 23 | 92 | 90 | 421 | 17 | 38 | 499 | 130 |
| Total Analysis Volume [veh/h] | 107 | 49 | 209 | 467 | 90 | 367 | 360 | 1684 | 68 | 151 | 1996 | 520 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.06 | 0.08 | 0.08 | 0.14 | 0.27 | 0.27 | 0.11 | 0.34 | 0.34 | 0.09 | 0.39 | 0.31 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.892 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | F |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.352 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 331 | 665 | 780 | 677 | 464 | 195 | 146 | 1791 | 244 | 699 | 2208 | 1173 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 331 | 665 | 780 | 677 | 464 | 195 | 146 | 1791 | 244 | 699 | 2208 | 1173 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 83 | 166 | 195 | 169 | 116 | 49 | 37 | 448 | 61 | 175 | 552 | 293 |
| Total Analysis Volume [veh/h] | 331 | 665 | 780 | 677 | 464 | 195 | 146 | 1791 | 244 | 699 | 2208 | 1173 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.10 | 0.20 | 0.46 | 0.34 | 0.19 | 0.19 | 0.04 | 0.30 | 0.30 | 0.21 | 0.43 | 0.35 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | F | | | | | | | | | | | |
| Intersection V/C | 1.352 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.895 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 581 | 0 | 836 | 0 | 2386 | 1272 | 0 | 2891 | 367 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 581 | 0 | 836 | 0 | 2386 | 1272 | 0 | 2891 | 367 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 145 | 0 | 209 | 0 | 597 | 318 | 0 | 723 | 92 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 581 | 0 | 836 | 0 | 2386 | 1272 | 0 | 2891 | 367 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.17 | 0.00 | 0.28 | 0.00 | 0.47 | 0.00 | 0.00 | 0.57 | 0.00 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.895 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | E |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.960 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1581 | 117 | 638 | 0 | 0 | 372 | 389 | 2123 | 702 | 0 | 2238 | 60 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1581 | 117 | 638 | 0 | 0 | 372 | 389 | 2123 | 702 | 0 | 2238 | 60 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 395 | 29 | 160 | 0 | 0 | 93 | 97 | 531 | 176 | 0 | 560 | 15 |
| Total Analysis Volume [veh/h] | 1581 | 117 | 638 | 0 | 0 | 372 | 389 | 2123 | 702 | 0 | 2238 | 60 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |

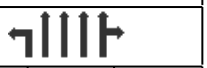
**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.31 | 0.34 | 0.34 | 0.00 | 0.00 | 0.00 | 0.23 | 0.42 | 0.00 | 0.00 | 0.34 | 0.34 |
| Intersection LOS | E | | | | | | | | | | | |
| Intersection V/C | 0.960 | | | | | | | | | | | |

**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.840 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 262 | 198 | 141 | 320 | 254 | 204 | 256 | 2033 | 270 | 191 | 1850 | 227 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 262 | 198 | 141 | 320 | 254 | 204 | 256 | 2033 | 270 | 191 | 1850 | 227 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 66 | 50 | 35 | 80 | 64 | 51 | 64 | 508 | 68 | 48 | 463 | 57 |
| Total Analysis Volume [veh/h] | 262 | 198 | 141 | 320 | 254 | 204 | 256 | 2033 | 270 | 191 | 1850 | 227 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.08 | 0.10 | 0.10 | 0.09 | 0.15 | 0.12 | 0.15 | 0.45 | 0.45 | 0.11 | 0.31 | 0.31 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.840 | | | | | | | | | | | |

**Intersection Level Of Service Report**

**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.787 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 211 | 18 | 276 | 28 | 12 | 13 | 26 | 2161 | 327 | 228 | 2180 | 50 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 211 | 18 | 276 | 28 | 12 | 13 | 26 | 2161 | 327 | 228 | 2180 | 50 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 53 | 5 | 69 | 7 | 3 | 3 | 7 | 540 | 82 | 57 | 545 | 13 |
| Total Analysis Volume [veh/h] | 211 | 18 | 276 | 28 | 12 | 13 | 26 | 2161 | 327 | 228 | 2180 | 50 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.06 | 0.07 | 0.16 | 0.02 | 0.01 | 0.01 | 0.02 | 0.42 | 0.19 | 0.13 | 0.44 | 0.44 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.787 | | | | | | | | | | | |

*APPENDIX C-VII*

# YEAR 2045 PLUS PROJECT WITH IMPROVEMENTS TRAFFIC CONDITIONS

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 ICU Network.vistro
Report File: N:\...\AM 2045+P-MIT.pdf

Scenario 18 [MIT] AM 2045+P
4/18/2022

**Intersection Analysis Summary**

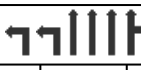
| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 14 | State College Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.826 | - | D |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.826 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 125 | 186 | 479 | 151 | 502 | 33 | 37 | 1775 | 214 | 534 | 1953 | 203 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 125 | 186 | 479 | 151 | 502 | 33 | 37 | 1775 | 214 | 534 | 1953 | 203 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 31 | 47 | 120 | 38 | 126 | 8 | 9 | 444 | 54 | 134 | 488 | 51 |
| Total Analysis Volume [veh/h] | 125 | 186 | 479 | 151 | 502 | 33 | 37 | 1775 | 214 | 534 | 1953 | 203 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.04 | 0.05 | 0.28 | 0.04 | 0.15 | 0.02 | 0.01 | 0.29 | 0.29 | 0.16 | 0.38 | 0.08 |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.826 | | | | | | | | | | | |

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 ICU Network.vistro
Report File: N:\...\PM 2045+P-MIT.pdf

Scenario 17 [MIT] PM 2045+P
4/18/2022

**Intersection Analysis Summary**

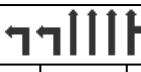
| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 14 | State College Boulevard at Imperial Highway | Signalized | ICU 1 | WB Thru | 0.941 | - | E |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | E |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.941 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 391 | 655 | 471 | 481 | 339 | 103 | 118 | 2096 | 122 | 497 | 2061 | 591 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 391 | 655 | 471 | 481 | 339 | 103 | 118 | 2096 | 122 | 497 | 2061 | 591 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 98 | 164 | 118 | 120 | 85 | 26 | 30 | 524 | 31 | 124 | 515 | 148 |
| Total Analysis Volume [veh/h] | 391 | 655 | 471 | 481 | 339 | 103 | 118 | 2096 | 122 | 497 | 2061 | 591 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.12 | 0.19 | 0.28 | 0.14 | 0.10 | 0.06 | 0.03 | 0.33 | 0.33 | 0.15 | 0.40 | 0.21 |
| Intersection LOS | E | | | | | | | | | | | |
| Intersection V/C | 0.941 | | | | | | | | | | | |

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 ICU Network.vistro
Report File: N:\...\Sat 2045+P-MIT.pdf
Scenario 16 [MIT] Sat MD 2045+P
4/18/2022

**Intersection Analysis Summary**

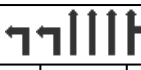
| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 14 | State College Boulevard at Imperial Highway | Signalized | ICU 1 | WB Right | 1.242 | - | F |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | - |
| Analysis Method: | ICU 1 | Level Of Service: | F |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.242 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 331 | 665 | 780 | 677 | 464 | 195 | 146 | 1791 | 244 | 699 | 2208 | 1173 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 331 | 665 | 780 | 677 | 464 | 195 | 146 | 1791 | 244 | 699 | 2208 | 1173 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 83 | 166 | 195 | 169 | 116 | 49 | 37 | 448 | 61 | 175 | 552 | 293 |
| Total Analysis Volume [veh/h] | 331 | 665 | 780 | 677 | 464 | 195 | 146 | 1791 | 244 | 699 | 2208 | 1173 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Cycle Length [s] | 100 |
| Lost time [s] | 5.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.10 | 0.20 | 0.46 | 0.20 | 0.14 | 0.11 | 0.04 | 0.30 | 0.30 | 0.21 | 0.43 | 0.49 |
| Intersection LOS | F | | | | | | | | | | | |
| Intersection V/C | 1.242 | | | | | | | | | | | |

# APPENDIX D

## INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS – HCM

*APPENDIX D-I*

# EXISTING TRAFFIC CONDITIONS

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 HCM Network.vistro
Report File: N:\...\AM Ex.pdf

Scenario 1 AM Existing
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | HCM 6th Edition | NB Thru | 0.746 | 34.0 | C |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | HCM 6th Edition | WB Left | 0.838 | 27.1 | C |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | HCM 6th Edition | EB Left | 0.852 | 28.0 | C |
| 4 | Randolph Avenue at Birch Street | Signalized | HCM 6th Edition | WB Left | 0.356 | 14.2 | B |
| 5 | State College Boulevard at Birch Street | Signalized | HCM 6th Edition | WB Left | 0.597 | 37.6 | D |
| 6 | S Associated Road at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.765 | 26.1 | C |
| 7 | Randolph Avenue at Madison Way | Signalized | HCM 6th Edition | SB Left | 0.140 | 17.3 | B |
| 8 | Randolph Avenue at Brea Mall | Signalized | HCM 6th Edition | EB Left | 0.106 | 8.2 | A |
| 9 | Brea Mall South at State College Boulevard | Signalized | HCM 6th Edition | WB Left | 0.205 | 15.6 | B |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.871 | 40.4 | D |
| 11 | Puente Street at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.514 | 18.1 | B |
| 12 | Brea Boulevard at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.860 | 40.2 | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.481 | 12.4 | B |
| 14 | State College Boulevard at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.781 | 30.4 | C |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.582 | 15.3 | B |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | HCM 6th Edition | EB Left | 0.630 | 21.2 | C |
| 17 | Associated Road at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.773 | 27.2 | C |
| 18 | Castlegate Lane/Placentia | Signalized | HCM 6th | EB Left | 0.669 | 18.1 | B |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | Edition | EB Left | 0.669 | 18.1 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 34.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.746 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 151 | 192 | 133 | 865 | 582 | 8 | 14 | 1220 | 196 | 431 | 1519 | 534 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 151 | 192 | 133 | 865 | 582 | 8 | 14 | 1220 | 196 | 431 | 1519 | 534 |
| Peak Hour Factor | 0.9130 | 0.9130 | 0.9130 | 0.9700 | 0.9700 | 0.9700 | 0.9540 | 0.9540 | 0.9540 | 0.9540 | 0.9540 | 0.9540 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 41 | 53 | 36 | 223 | 150 | 2 | 4 | 320 | 51 | 113 | 398 | 140 |
| Total Analysis Volume [veh/h] | 165 | 210 | 146 | 892 | 600 | 8 | 15 | 1279 | 205 | 452 | 1592 | 560 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 12 | 10 | 0 | 46 | 44 | 0 | 10 | 39 | 0 | 25 | 54 | 54 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 28 | 0 | 0 | 22 | 22 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 8 | 10 | 10 | 10 | 35 | 38 | 38 | 2 | 41 | 41 | 18 | 56 | 96 |
| g / C, Green / Cycle | 0.06 | 0.08 | 0.08 | 0.08 | 0.29 | 0.31 | 0.31 | 0.02 | 0.34 | 0.34 | 0.15 | 0.47 | 0.80 |
| (v / s)_i Volume / Saturation Flow Rate | 0.05 | 0.07 | 0.06 | 0.06 | 0.25 | 0.16 | 0.16 | 0.00 | 0.19 | 0.20 | 0.13 | 0.28 | 0.29 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1900 | 3500 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 222 | 160 | 160 | 160 | 1022 | 594 | 594 | 72 | 1951 | 650 | 518 | 2678 | 1511 |
| d1, Uniform Delay [s] | 55.25 | 53.88 | 53.73 | 53.43 | 40.39 | 33.76 | 33.74 | 57.83 | 32.25 | 32.32 | 50.03 | 23.42 | 3.58 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.82 | 8.05 | 6.90 | 5.14 | 2.51 | 0.69 | 0.68 | 1.41 | 1.21 | 3.66 | 4.72 | 0.98 | 0.70 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.74 | 0.78 | 0.75 | 0.69 | 0.87 | 0.51 | 0.51 | 0.21 | 0.57 | 0.57 | 0.87 | 0.59 | 0.37 |
| d, Delay for Lane Group [s/veh] | 60.06 | 61.93 | 60.63 | 58.56 | 42.90 | 34.45 | 34.42 | 59.24 | 33.46 | 35.98 | 54.75 | 24.40 | 4.28 |
| Lane Group LOS | E | E | E | E | D | C | C | E | C | D | D | C | A |
| Critical Lane Group | No | Yes | No | No | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.60 | 4.07 | 3.86 | 3.46 | 12.76 | 7.38 | 7.35 | 0.24 | 8.97 | 9.50 | 6.96 | 11.12 | 3.41 |
| 50th-Percentile Queue Length [ft/ln] | 65.09 | 101.7 | 96.58 | 86.56 | 319.06 | 184.42 | 183.69 | 5.96 | 224.17 | 237.62 | 174.11 | 277.91 | 85.29 |
| 95th-Percentile Queue Length [veh/ln] | 4.69 | 7.33 | 6.95 | 6.23 | 18.62 | 11.83 | 11.79 | 0.43 | 13.88 | 14.56 | 11.29 | 16.58 | 6.14 |
| 95th-Percentile Queue Length [ft/ln] | 117.1 | 183.2 | 173.8 | 155.8 | 465.53 | 295.78 | 294.83 | 10.73 | 346.94 | 364.02 | 282.31 | 414.61 | 153.52 |

**Movement, Approach, & Intersection Results**

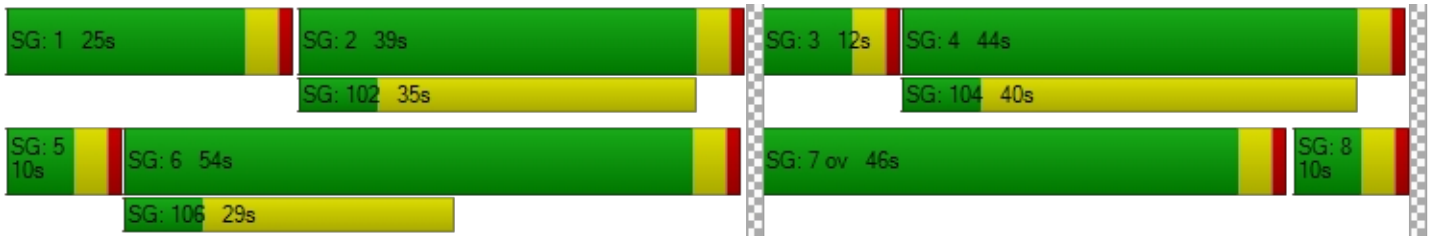
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 60.06 | 61.41 | 58.98 | 42.90 | 34.44 | 34.42 | 59.24 | 33.79 | 35.98 | 54.75 | 24.40 | 4.28 |
| Movement LOS | E | E | E | D | C | C | E | C | D | D | C | A |
| d_A, Approach Delay [s/veh] | 60.33 | | | 39.47 | | | 34.35 | | | 25.34 | | |
| Approach LOS | E | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 33.98 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.746 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.855 | 2.838 | 3.217 | 0.000 |
| Crosswalk LOS | C | C | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 100 | 666 | 583 | 833 |
| d_b, Bicycle Delay [s] | 54.17 | 26.68 | 30.12 | 20.43 |
| l_b,int, Bicycle LOS Score for Intersection | 1.989 | 2.797 | 2.178 | 2.992 |
| Bicycle LOS | A | C | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 27.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.838 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 1026 | 0 | 513 | 0 | 1659 | 565 | 217 | 2027 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 1026 | 0 | 513 | 0 | 1659 | 565 | 217 | 2027 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 0.8640 | 1.0000 | 0.8640 | 1.0000 | 0.9400 | 0.9400 | 0.9190 | 0.9190 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 297 | 0 | 148 | 0 | 441 | 150 | 59 | 551 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 1188 | 0 | 594 | 0 | 1765 | 601 | 236 | 2206 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 47 | 0 | 0 | 0 | 32 | 0 | 11 | 43 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 14 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | No | No | |
| Maximum Recall | | | | No | | | | No | | No | No | |
| Pedestrian Recall | | | | No | | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | C | R | C | C | R | L | C |
|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 35 | 35 | 35 | 36 | 36 | 36 | 7 | 47 |
| g / C, Green / Cycle | | 0.39 | 0.39 | 0.39 | 0.40 | 0.40 | 0.40 | 0.08 | 0.52 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.34 | 0.34 | 0.31 | 0.31 | 0.31 | 0.31 | 0.07 | 0.39 |
| s, saturation flow rate [veh/h] | | 1750 | 1750 | 1900 | 3800 | 1900 | 1900 | 3500 | 5700 |
| c, Capacity [veh/h] | | 682 | 682 | 740 | 1514 | 757 | 757 | 276 | 2973 |
| d1, Uniform Delay [s] | | 25.40 | 25.40 | 24.41 | 23.66 | 23.66 | 23.66 | 40.98 | 16.81 |
| k, delay calibration | | 0.25 | 0.25 | 0.21 | 0.50 | 0.50 | 0.50 | 0.11 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 7.83 | 7.83 | 3.91 | 4.08 | 7.87 | 7.87 | 7.54 | 1.72 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | | 0.87 | 0.87 | 0.80 | 0.78 | 0.78 | 0.78 | 0.86 | 0.74 |
|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | | 33.23 | 33.23 | 28.32 | 27.74 | 31.52 | 31.52 | 48.51 | 18.53 |
| Lane Group LOS | | C | C | C | C | C | C | D | B |
| Critical Lane Group | | Yes | No | No | No | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | | 12.62 | 12.62 | 11.51 | 11.29 | 12.08 | 12.08 | 2.84 | 11.36 |
| 50th-Percentile Queue Length [ft/ln] | | 315.47 | 315.47 | 287.65 | 282.20 | 302.11 | 302.11 | 71.00 | 283.99 |
| 95th-Percentile Queue Length [veh/ln] | | 18.44 | 18.44 | 17.07 | 16.80 | 17.79 | 17.79 | 5.11 | 16.89 |
| 95th-Percentile Queue Length [ft/ln] | | 461.12 | 461.12 | 426.73 | 419.95 | 444.64 | 444.64 | 127.80 | 422.18 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 33.23 | 0.00 | 28.32 | 0.00 | 28.14 | 31.52 | 48.51 | 18.53 | 0.00 |
| Movement LOS | | | | C | | C | | C | C | D | B | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 31.59 | | | 29.63 | | | 21.42 | | |
| Approach LOS | A | | | C | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 27.12 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.838 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.122 | 2.519 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 955 | 622 | 866 |
| d_b, Bicycle Delay [s] | 45.01 | 12.28 | 21.37 | 14.46 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 4.500 | 2.861 | 2.903 |
| Bicycle LOS | D | E | C | C |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 28.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.852 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | | | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1019 | 0 | 482 | 0 | 0 | 0 | 275 | 2399 | 0 | 0 | 1237 | 475 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1019 | 0 | 482 | 0 | 0 | 0 | 275 | 2399 | 0 | 0 | 1237 | 475 |
| Peak Hour Factor | 0.8940 | 1.0000 | 0.8940 | 1.0000 | 1.0000 | 1.0000 | 0.9710 | 0.9710 | 1.0000 | 1.0000 | 0.8830 | 0.8830 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 285 | 0 | 135 | 0 | 0 | 0 | 71 | 618 | 0 | 0 | 350 | 134 |
| Total Analysis Volume [veh/h] | 1140 | 0 | 539 | 0 | 0 | 0 | 283 | 2471 | 0 | 0 | 1401 | 538 |
| Presence of On-Street Parking | No | | No | | | | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 110 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 6 | 0 | 0 | 0 | 0 | 0 | 6 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 0 | 0 | 0 | 0 | 0 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 74 | 0 | 0 | 0 | 0 | 0 | 15 | 36 | 0 | 0 | 21 | 0 |
| Vehicle Extension [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 10 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | No | | | | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | | | | | | No | No | | | No | |
| Maximum Recall | No | | | | | | No | No | | | No | |
| Pedestrian Recall | No | | | | | | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | R | | L | C | C | C | R |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 110 | 110 | | 110 | 110 | 110 | 110 | 110 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 42 | 42 | | 11 | 60 | 46 | 46 | 46 |
| g / C, Green / Cycle | 0.38 | 0.38 | | 0.10 | 0.55 | 0.41 | 0.41 | 0.41 |
| (v / s)_i Volume / Saturation Flow Rate | 0.33 | 0.28 | | 0.08 | 0.43 | 0.26 | 0.26 | 0.26 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | | 3500 | 5700 | 3800 | 1900 | 1900 |
| c, Capacity [veh/h] | 1324 | 719 | | 343 | 3129 | 1575 | 788 | 788 |
| d1, Uniform Delay [s] | 31.51 | 29.67 | | 48.67 | 19.75 | 25.31 | 25.31 | 25.31 |
| k, delay calibration | 0.11 | 0.11 | | 0.11 | 0.50 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.77 | 1.60 | | 5.01 | 2.11 | 1.81 | 3.58 | 3.58 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.86 | 0.75 | | 0.82 | 0.79 | 0.62 | 0.62 | 0.62 |
| d, Delay for Lane Group [s/veh] | 33.28 | 31.26 | | 53.68 | 21.86 | 27.12 | 28.89 | 28.89 |
| Lane Group LOS | C | C | | D | C | C | C | C |
| Critical Lane Group | Yes | No | | No | Yes | No | No | No |
| 50th-Percentile Queue Length [veh/ln] | 13.94 | 12.44 | | 4.04 | 16.46 | 10.16 | 10.55 | 10.55 |
| 50th-Percentile Queue Length [ft/ln] | 348.49 | 310.94 | | 100.94 | 411.52 | 253.97 | 263.68 | 263.68 |
| 95th-Percentile Queue Length [veh/ln] | 20.06 | 18.22 | | 7.27 | 23.11 | 15.39 | 15.87 | 15.87 |
| 95th-Percentile Queue Length [ft/ln] | 501.56 | 455.54 | | 181.70 | 577.86 | 384.65 | 396.83 | 396.83 |

**Movement, Approach, & Intersection Results**

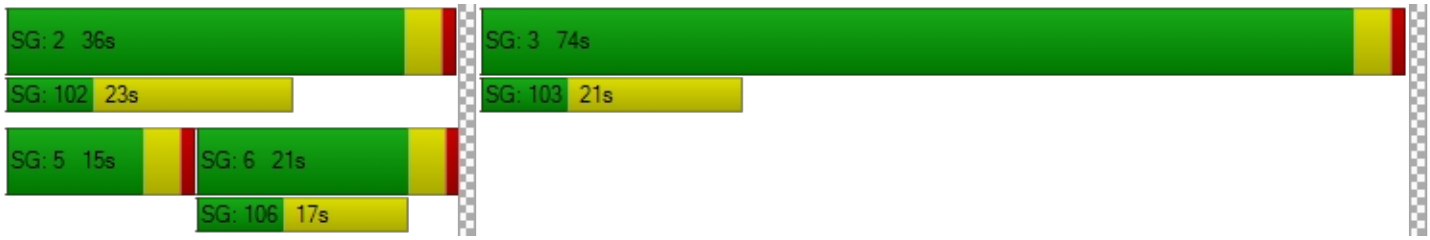
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 33.28 | 0.00 | 31.26 | 0.00 | 0.00 | 0.00 | 53.68 | 21.86 | 0.00 | 0.00 | 27.25 | 28.89 |
| Movement LOS | C | | C | | | | D | C | | | C | C |
| d_A, Approach Delay [s/veh] | 32.64 | | | 0.00 | | | 25.13 | | | 28.00 | | |
| Approach LOS | C | | | A | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 27.98 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.852 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 44.54 | 44.54 | 0.00 | 44.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.495 | 2.125 | 0.000 | 3.293 |
| Crosswalk LOS | B | B | F | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1273 | 0 | 582 | 309 |
| d_b, Bicycle Delay [s] | 7.27 | 54.99 | 27.65 | 39.31 |
| l_b,int, Bicycle LOS Score for Intersection | 1.560 | 4.132 | 3.074 | 2.626 |
| Bicycle LOS | A | D | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 14.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.356 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 23 | 40 | 85 | 37 | 35 | 25 | 39 | 554 | 89 | 70 | 468 | 43 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 23 | 40 | 85 | 37 | 35 | 25 | 39 | 554 | 89 | 70 | 468 | 43 |
| Peak Hour Factor | 0.8140 | 0.8140 | 0.8140 | 0.7190 | 0.7190 | 0.7190 | 0.8220 | 0.8220 | 0.8220 | 0.8940 | 0.8940 | 0.8940 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 12 | 26 | 13 | 12 | 9 | 12 | 168 | 27 | 20 | 131 | 12 |
| Total Analysis Volume [veh/h] | 28 | 49 | 104 | 51 | 49 | 35 | 47 | 674 | 108 | 78 | 523 | 48 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 50 | 0 | 0 | 50 | 0 | 10 | 30 | 0 | 10 | 30 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 25 | 0 | 0 | 19 | 0 | 0 | 18 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 7 | 7 | 7 | 7 | 7 | 4 | 66 | 66 | 5 | 67 | 67 |
| g / C, Green / Cycle | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.05 | 0.73 | 0.73 | 0.06 | 0.74 | 0.74 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.03 | 0.05 | 0.03 | 0.04 | 0.03 | 0.21 | 0.20 | 0.04 | 0.14 | 0.03 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 114 | 152 | 152 | 146 | 152 | 85 | 1384 | 1384 | 105 | 2810 | 1405 |
| d1, Uniform Delay [s] | 38.71 | 39.11 | 40.31 | 39.22 | 39.87 | 41.96 | 4.21 | 4.16 | 41.74 | 3.54 | 3.14 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.10 | 1.21 | 5.34 | 1.41 | 3.11 | 5.49 | 0.53 | 0.49 | 9.89 | 0.15 | 0.05 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.25 | 0.32 | 0.68 | 0.35 | 0.55 | 0.55 | 0.29 | 0.28 | 0.74 | 0.19 | 0.03 |
| d, Delay for Lane Group [s/veh] | 39.81 | 40.33 | 45.65 | 40.63 | 42.98 | 47.46 | 4.74 | 4.65 | 51.62 | 3.69 | 3.18 |
| Lane Group LOS | D | D | D | D | D | D | A | A | D | A | A |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.61 | 1.06 | 2.44 | 1.11 | 1.90 | 1.14 | 2.17 | 2.05 | 1.97 | 1.15 | 0.20 |
| 50th-Percentile Queue Length [ft/ln] | 15.19 | 26.59 | 61.01 | 27.85 | 47.51 | 28.53 | 54.33 | 51.13 | 49.35 | 28.78 | 4.88 |
| 95th-Percentile Queue Length [veh/ln] | 1.09 | 1.91 | 4.39 | 2.01 | 3.42 | 2.05 | 3.91 | 3.68 | 3.55 | 2.07 | 0.35 |
| 95th-Percentile Queue Length [ft/ln] | 27.34 | 47.87 | 109.81 | 50.14 | 85.53 | 51.35 | 97.80 | 92.04 | 88.84 | 51.80 | 8.79 |

**Movement, Approach, & Intersection Results**

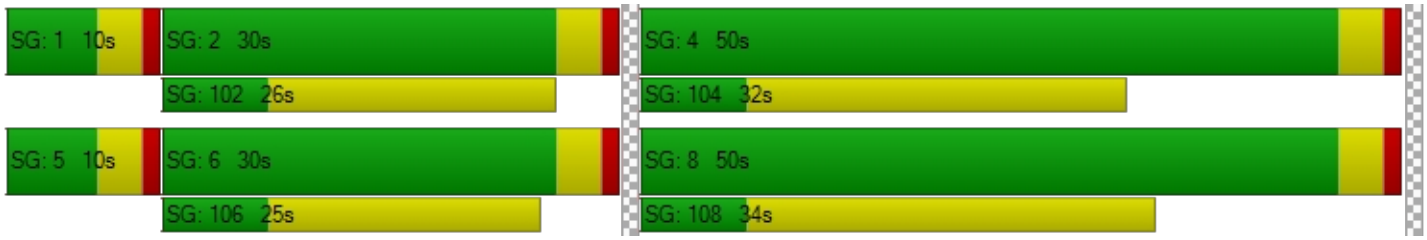
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 39.81 | 40.33 | 45.65 | 40.63 | 42.98 | 42.98 | 47.46 | 4.70 | 4.65 | 51.62 | 3.69 | 3.18 |
| Movement LOS | D | D | D | D | D | D | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 43.31 | | | 42.09 | | | 7.12 | | | 9.41 | | |
| Approach LOS | D | | | D | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 14.23 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.356 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.232 | 2.030 | 2.615 | 2.765 |
| Crosswalk LOS | B | B | B | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1022 | 1022 | 578 | 578 |
| d_b, Bicycle Delay [s] | 10.76 | 10.76 | 22.77 | 22.77 |
| l_b,int, Bicycle LOS Score for Intersection | 1.858 | 1.782 | 2.244 | 2.095 |
| Bicycle LOS | A | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 37.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.597 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 76 | 120 | 96 | 628 | 779 | 145 | 75 | 502 | 47 | 78 | 555 | 273 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 76 | 120 | 96 | 628 | 779 | 145 | 75 | 502 | 47 | 78 | 555 | 273 |
| Peak Hour Factor | 0.8430 | 0.8430 | 0.8430 | 0.8910 | 0.8910 | 0.8910 | 0.8600 | 0.8600 | 0.8600 | 0.7640 | 0.7640 | 0.7640 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 23 | 36 | 28 | 176 | 219 | 41 | 22 | 146 | 14 | 26 | 182 | 89 |
| Total Analysis Volume [veh/h] | 90 | 142 | 114 | 705 | 874 | 163 | 87 | 584 | 55 | 102 | 726 | 357 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 29 | 39 | 0 | 32 | 42 | 0 | 11 | 39 | 0 | 10 | 38 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 16 | 16 | 26 | 37 | 37 | 6 | 56 | 56 | 6 | 56 | 56 |
| g / C, Green / Cycle | 0.05 | 0.13 | 0.13 | 0.22 | 0.30 | 0.30 | 0.05 | 0.47 | 0.47 | 0.05 | 0.47 | 0.47 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.04 | 0.06 | 0.20 | 0.28 | 0.27 | 0.02 | 0.15 | 0.03 | 0.03 | 0.19 | 0.19 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 3500 | 1900 | 1900 | 3500 | 3800 | 1900 | 3500 | 3800 | 1900 |
| c, Capacity [veh/h] | 169 | 507 | 253 | 768 | 579 | 579 | 168 | 1766 | 883 | 172 | 1770 | 885 |
| d1, Uniform Delay [s] | 55.81 | 46.83 | 47.96 | 45.81 | 40.10 | 39.78 | 55.79 | 20.32 | 17.71 | 55.91 | 21.17 | 21.09 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.16 | 0.15 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 2.59 | 0.30 | 1.25 | 5.00 | 7.82 | 6.34 | 2.45 | 0.50 | 0.14 | 3.24 | 0.70 | 1.37 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.53 | 0.28 | 0.45 | 0.92 | 0.91 | 0.89 | 0.52 | 0.33 | 0.06 | 0.59 | 0.41 | 0.40 |
| d, Delay for Lane Group [s/veh] | 58.39 | 47.13 | 49.21 | 50.81 | 47.92 | 46.12 | 58.24 | 20.82 | 17.84 | 59.15 | 21.87 | 22.45 |
| Lane Group LOS | E | D | D | D | D | D | E | C | B | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 1.39 | 1.94 | 3.24 | 10.75 | 15.95 | 15.30 | 1.35 | 5.27 | 0.88 | 1.59 | 6.86 | 6.88 |
| 50th-Percentile Queue Length [ft/ln] | 34.84 | 48.51 | 81.10 | 268.77 | 398.70 | 382.39 | 33.63 | 131.86 | 21.97 | 39.80 | 171.42 | 172.09 |
| 95th-Percentile Queue Length [veh/ln] | 2.51 | 3.49 | 5.84 | 16.13 | 22.50 | 21.71 | 2.42 | 9.04 | 1.58 | 2.87 | 11.15 | 11.19 |
| 95th-Percentile Queue Length [ft/ln] | 62.72 | 87.31 | 145.97 | 403.21 | 562.43 | 542.74 | 60.53 | 226.03 | 39.55 | 71.64 | 278.78 | 279.66 |

**Movement, Approach, & Intersection Results**

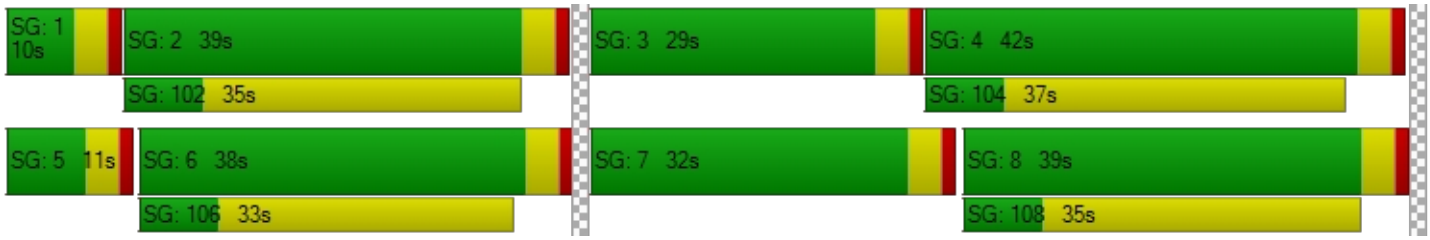
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 58.39 | 47.13 | 49.21 | 50.81 | 47.20 | 46.12 | 58.24 | 20.82 | 17.84 | 59.15 | 21.87 | 22.45 |
| Movement LOS | E | D | D | D | D | D | E | C | B | E | C | C |
| d_A, Approach Delay [s/veh] | 50.75 | | | 48.56 | | | 25.08 | | | 25.26 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 37.58 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.597 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 49.52 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.799 | 2.845 | 2.845 | 2.968 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 583 | 633 | 583 | 567 |
| d_b, Bicycle Delay [s] | 30.12 | 28.03 | 30.12 | 30.83 |
| l_b,int, Bicycle LOS Score for Intersection | 1.845 | 2.997 | 2.159 | 2.537 |
| Bicycle LOS | A | C | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 26.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.765 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 234 | 6 | 307 | 55 | 28 | 8 | 2 | 909 | 302 | 341 | 747 | 11 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 234 | 6 | 307 | 55 | 28 | 8 | 2 | 909 | 302 | 341 | 747 | 11 |
| Peak Hour Factor | 0.8160 | 0.8160 | 0.8160 | 0.7410 | 0.7410 | 0.7410 | 0.8560 | 0.8560 | 0.8560 | 0.9140 | 0.9140 | 0.9140 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 72 | 2 | 94 | 19 | 9 | 3 | 1 | 265 | 88 | 93 | 204 | 3 |
| Total Analysis Volume [veh/h] | 287 | 7 | 376 | 74 | 38 | 11 | 2 | 1062 | 353 | 373 | 817 | 12 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 115 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 6 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 30 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 20 | 57 | 57 | 0 | 37 | 0 | 10 | 38 | 0 | 20 | 48 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 7 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 26 | 0 | 26 | 0 | 0 | 27 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | No | | No | | No | No | | No | No | |
| Maximum Recall | No | No | No | | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | No | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 12 | 22 | 42 | 7 | 7 | 0 | 65 | 65 | 16 | 80 | 80 |
| g / C, Green / Cycle | 0.10 | 0.19 | 0.37 | 0.06 | 0.06 | 0.00 | 0.56 | 0.56 | 0.14 | 0.70 | 0.70 |
| (v / s)_i Volume / Saturation Flow Rate | 0.08 | 0.00 | 0.20 | 0.04 | 0.03 | 0.00 | 0.39 | 0.36 | 0.11 | 0.22 | 0.22 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 |
| c, Capacity [veh/h] | 355 | 371 | 702 | 137 | 112 | 8 | 1066 | 1066 | 488 | 1323 | 1323 |
| d1, Uniform Delay [s] | 50.61 | 37.41 | 28.53 | 53.13 | 52.30 | 57.12 | 18.04 | 17.31 | 47.69 | 6.79 | 6.78 |
| k, delay calibration | 0.11 | 0.11 | 0.27 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.40 | 0.02 | 1.61 | 3.30 | 2.66 | 17.13 | 3.61 | 2.95 | 2.52 | 0.62 | 0.62 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.81 | 0.02 | 0.54 | 0.54 | 0.44 | 0.26 | 0.69 | 0.64 | 0.76 | 0.31 | 0.31 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 55.01 | 37.43 | 30.13 | 56.44 | 54.96 | 74.25 | 21.65 | 20.26 | 50.22 | 7.42 | 7.40 |
| Lane Group LOS | E | D | C | E | D | E | C | C | D | A | A |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 4.26 | 0.16 | 8.42 | 2.22 | 1.45 | 0.09 | 14.31 | 12.73 | 5.31 | 3.84 | 3.81 |
| 50th-Percentile Queue Length [ft/ln] | 106.40 | 4.07 | 210.49 | 55.61 | 36.27 | 2.36 | 357.81 | 318.15 | 132.76 | 95.93 | 95.34 |
| 95th-Percentile Queue Length [veh/ln] | 7.64 | 0.29 | 13.18 | 4.00 | 2.61 | 0.17 | 20.52 | 18.58 | 9.09 | 6.91 | 6.86 |
| 95th-Percentile Queue Length [ft/ln] | 190.98 | 7.32 | 329.45 | 100.09 | 65.29 | 4.25 | 512.92 | 464.41 | 227.24 | 172.68 | 171.61 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 55.01 | 37.43 | 30.13 | 56.44 | 54.96 | 54.96 | 74.25 | 21.22 | 20.26 | 50.22 | 7.41 | 7.40 |
| Movement LOS | E | D | C | E | D | D | E | C | C | D | A | A |
| d_A, Approach Delay [s/veh] | 40.86 | | | 55.85 | | | 21.05 | | | 20.69 | | |
| Approach LOS | D | | | E | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 26.07 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.765 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 47.05 | 47.05 | 47.05 | 47.05 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.698 | 1.999 | 2.805 | 3.011 |
| Crosswalk LOS | B | A | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 921 | 574 | 591 | 765 |
| d_b, Bicycle Delay [s] | 16.73 | 29.25 | 28.54 | 21.93 |
| l_b,int, Bicycle LOS Score for Intersection | 2.665 | 1.763 | 2.729 | 2.551 |
| Bicycle LOS | B | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 17.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.140 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 25 | 130 | 8 | 6 | 119 | 14 | 32 | 2 | 57 | 0 | 0 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 25 | 130 | 8 | 6 | 119 | 14 | 32 | 2 | 57 | 0 | 0 | 0 |
| Peak Hour Factor | 0.9010 | 0.9010 | 0.9010 | 0.6500 | 0.6500 | 0.6500 | 0.5970 | 0.5970 | 0.5970 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 36 | 2 | 2 | 46 | 5 | 13 | 1 | 24 | 0 | 0 | 0 |
| Total Analysis Volume [veh/h] | 28 | 144 | 9 | 9 | 183 | 22 | 54 | 3 | 95 | 0 | 0 | 0 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 26 | 0 | 10 | 26 | 0 | 0 | 54 | 0 | 0 | 54 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 12 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | L | C | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 3 | 70 | 70 | 1 | 68 | 68 | 7 | 7 | 7 | 7 |
| g / C, Green / Cycle | 0.03 | 0.78 | 0.78 | 0.01 | 0.76 | 0.76 | 0.07 | 0.07 | 0.07 | 0.07 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.04 | 0.04 | 0.01 | 0.05 | 0.05 | 0.03 | 0.05 | 0.00 | 0.00 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 63 | 1476 | 1476 | 26 | 1438 | 1438 | 181 | 143 | 92 | 143 |
| d1, Uniform Delay [s] | 42.61 | 2.34 | 2.34 | 43.93 | 2.82 | 2.82 | 39.69 | 40.59 | 0.00 | 0.00 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.92 | 0.07 | 0.07 | 7.37 | 0.10 | 0.10 | 0.91 | 5.68 | 0.00 | 0.00 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.45 | 0.05 | 0.05 | 0.34 | 0.07 | 0.07 | 0.30 | 0.69 | 0.00 | 0.00 |
| d, Delay for Lane Group [s/veh] | 47.53 | 2.41 | 2.40 | 51.30 | 2.92 | 2.91 | 40.60 | 46.28 | 0.00 | 0.00 |
| Lane Group LOS | D | A | A | D | A | A | D | D | A | A |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.69 | 0.24 | 0.24 | 0.25 | 0.39 | 0.38 | 1.17 | 2.32 | 0.00 | 0.00 |
| 50th-Percentile Queue Length [ft/ln] | 17.26 | 6.03 | 5.99 | 6.28 | 9.64 | 9.49 | 29.33 | 57.96 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [veh/ln] | 1.24 | 0.43 | 0.43 | 0.45 | 0.69 | 0.68 | 2.11 | 4.17 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln] | 31.07 | 10.86 | 10.78 | 11.30 | 17.35 | 17.08 | 52.79 | 104.32 | 0.00 | 0.00 |

**Movement, Approach, & Intersection Results**

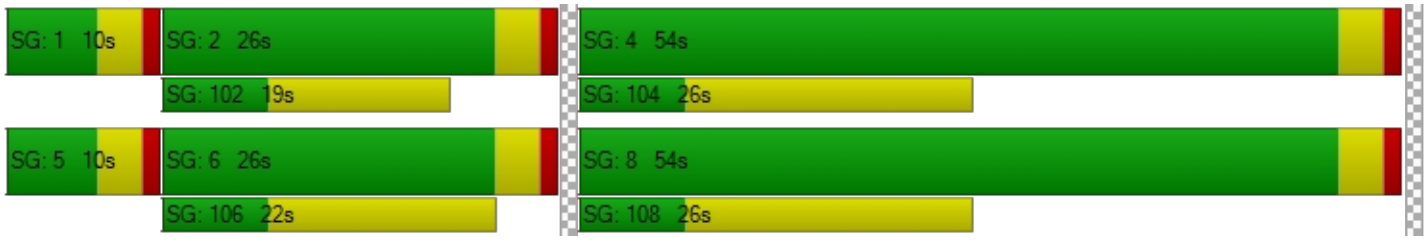
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 47.53 | 2.41 | 2.40 | 51.30 | 2.91 | 2.91 | 40.60 | 46.28 | 46.28 | 0.00 | 0.00 | 0.00 |
| Movement LOS | D | A | A | D | A | A | D | D | D | A | A | A |
| d_A, Approach Delay [s/veh] | 9.39 | | | 4.95 | | | 44.26 | | | 0.00 | | |
| Approach LOS | A | | | A | | | D | | | A | | |
| d_I, Intersection Delay [s/veh] | 17.34 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.140 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.389 | 2.457 | 2.005 | 1.947 |
| Crosswalk LOS | B | B | B | A |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 489 | 489 | 1111 | 1111 |
| d_b, Bicycle Delay [s] | 25.70 | 25.70 | 8.90 | 8.90 |
| l_b,int, Bicycle LOS Score for Intersection | 1.709 | 1.736 | 1.810 | 1.560 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 8.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.106 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 13 | 163 | 66 | 15 | 141 | 6 | 1 | 0 | 1 | 26 | 0 | 5 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 13 | 163 | 66 | 15 | 141 | 6 | 1 | 0 | 1 | 26 | 0 | 5 |
| Peak Hour Factor | 0.8280 | 0.8280 | 0.8280 | 0.9050 | 0.9050 | 0.9050 | 0.2500 | 0.2500 | 0.2500 | 0.6000 | 0.6000 | 0.6000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 49 | 20 | 4 | 39 | 2 | 1 | 0 | 1 | 11 | 0 | 2 |
| Total Analysis Volume [veh/h] | 16 | 197 | 80 | 17 | 156 | 7 | 4 | 0 | 4 | 43 | 0 | 8 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 30 | 0 | 10 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 17 | 0 | 0 | 18 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | C | R | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 0.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 82 | 76 | 76 | 82 | 76 | 76 | 1 | 1 | 5 | 5 |
| g / C, Green / Cycle | 0.82 | 0.76 | 0.76 | 0.82 | 0.76 | 0.76 | 0.01 | 0.01 | 0.05 | 0.05 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.07 | 0.07 | 0.01 | 0.04 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 1558 | 1441 | 1441 | 1541 | 1443 | 1443 | 23 | 24 | 83 | 87 |
| d1, Uniform Delay [s] | 1.61 | 3.16 | 3.15 | 1.61 | 3.03 | 3.03 | 48.89 | 48.89 | 46.19 | 46.15 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.00 | 0.14 | 0.13 | 0.01 | 0.07 | 0.07 | 3.66 | 3.25 | 2.09 | 1.81 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.01 | 0.10 | 0.09 | 0.01 | 0.06 | 0.06 | 0.18 | 0.17 | 0.31 | 0.29 |
|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 1.61 | 3.30 | 3.28 | 1.62 | 3.10 | 3.10 | 52.55 | 52.14 | 48.28 | 47.96 |
| Lane Group LOS | A | A | A | A | A | A | D | D | D | D |
| Critical Lane Group | No | Yes | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.03 | 0.64 | 0.60 | 0.04 | 0.35 | 0.35 | 0.12 | 0.12 | 0.66 | 0.65 |
| 50th-Percentile Queue Length [ft/ln] | 0.86 | 15.99 | 15.12 | 1.02 | 8.82 | 8.77 | 3.04 | 3.00 | 16.54 | 16.31 |
| 95th-Percentile Queue Length [veh/ln] | 0.06 | 1.15 | 1.09 | 0.07 | 0.63 | 0.63 | 0.22 | 0.22 | 1.19 | 1.17 |
| 95th-Percentile Queue Length [ft/ln] | 1.55 | 28.79 | 27.21 | 1.84 | 15.87 | 15.79 | 5.46 | 5.40 | 29.78 | 29.36 |

**Movement, Approach, & Intersection Results**

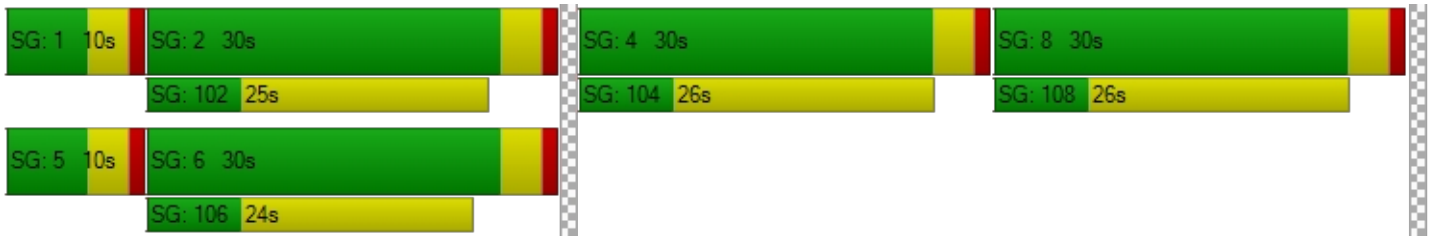
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 1.61 | 3.29 | 3.28 | 1.62 | 3.10 | 3.10 | 52.55 | 52.55 | 52.14 | 48.15 | 47.96 | 47.96 |
| Movement LOS | A | A | A | A | A | A | D | D | D | D | D | D |
| d_A, Approach Delay [s/veh] | 3.19 | | | 2.96 | | | 52.34 | | | 48.12 | | |
| Approach LOS | A | | | A | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 8.16 | | | | | | | | | | | |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.106 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 39.62 | 39.62 | 39.62 | 39.62 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.401 | 2.381 | 1.973 | 2.012 |
| Crosswalk LOS | B | B | A | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 520 | 520 | 520 | 520 |
| d_b, Bicycle Delay [s] | 27.40 | 27.40 | 27.40 | 27.40 |
| l_b,int, Bicycle LOS Score for Intersection | 1.801 | 1.708 | 1.573 | 1.644 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 15.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.205 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 32 | 5 | 15 | 3 | 2 | 27 | 77 | 238 | 15 | 27 | 319 | 12 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 32 | 5 | 15 | 3 | 2 | 27 | 77 | 238 | 15 | 27 | 319 | 12 |
| Peak Hour Factor | 0.5830 | 0.5830 | 0.5830 | 0.5500 | 0.5500 | 0.5500 | 0.8240 | 0.8240 | 0.8240 | 0.9420 | 0.9420 | 0.9420 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 14 | 2 | 6 | 1 | 1 | 12 | 23 | 72 | 5 | 7 | 85 | 3 |
| Total Analysis Volume [veh/h] | 55 | 9 | 26 | 5 | 4 | 49 | 93 | 289 | 18 | 29 | 339 | 13 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 6 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 30 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 37 | 0 | 0 | 10 | 10 | 11 | 33 | 0 | 10 | 32 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 21 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | No | No | No | | No | No | |
| Maximum Recall | | No | | | No | No | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | No | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | C | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 5 | 5 | 5 | 5 | 5 | 24 | 5 | 61 | 61 | 3 | 59 | 59 |
| g / C, Green / Cycle | 0.06 | 0.06 | 0.06 | 0.05 | 0.05 | 0.26 | 0.06 | 0.68 | 0.68 | 0.04 | 0.65 | 0.65 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.03 | 0.01 | 0.00 | 0.00 | 0.03 | 0.03 | 0.08 | 0.08 | 0.02 | 0.09 | 0.09 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 1900 | 1900 |
| c, Capacity [veh/h] | 155 | 181 | 116 | 94 | 99 | 500 | 215 | 1280 | 1280 | 64 | 1232 | 1232 |
| d1, Uniform Delay [s] | 40.17 | 40.82 | 40.33 | 40.61 | 40.58 | 25.13 | 40.82 | 5.23 | 5.22 | 42.61 | 6.15 | 6.15 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.33 | 0.73 | 0.98 | 0.23 | 0.16 | 0.08 | 1.38 | 0.19 | 0.19 | 4.85 | 0.24 | 0.24 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.11 | 0.25 | 0.23 | 0.05 | 0.04 | 0.10 | 0.43 | 0.12 | 0.12 | 0.45 | 0.14 | 0.14 |
| d, Delay for Lane Group [s/veh] | 40.50 | 41.55 | 41.30 | 40.84 | 40.74 | 25.22 | 42.20 | 5.42 | 5.41 | 47.45 | 6.40 | 6.39 |
| Lane Group LOS | D | D | D | D | D | C | D | A | A | D | A | A |
| Critical Lane Group | No | Yes | No | No | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.39 | 1.01 | 0.58 | 0.11 | 0.09 | 0.80 | 1.03 | 0.95 | 0.94 | 0.71 | 1.23 | 1.22 |
| 50th-Percentile Queue Length [ft/ln] | 9.65 | 25.36 | 14.38 | 2.76 | 2.20 | 19.91 | 25.65 | 23.75 | 23.40 | 17.84 | 30.74 | 30.46 |
| 95th-Percentile Queue Length [veh/ln] | 0.69 | 1.83 | 1.04 | 0.20 | 0.16 | 1.43 | 1.85 | 1.71 | 1.69 | 1.28 | 2.21 | 2.19 |
| 95th-Percentile Queue Length [ft/ln] | 17.36 | 45.64 | 25.88 | 4.98 | 3.96 | 35.83 | 46.18 | 42.75 | 42.13 | 32.10 | 55.33 | 54.83 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 41.18 | 41.55 | 41.30 | 40.84 | 40.74 | 25.22 | 42.20 | 5.42 | 5.41 | 47.45 | 6.40 | 6.39 |
| Movement LOS | D | D | D | D | D | C | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 41.27 | | | 27.63 | | | 13.97 | | | 9.52 | | |
| Approach LOS | D | | | C | | | B | | | A | | |
| d_I, Intersection Delay [s/veh] | 15.64 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.205 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.72 | 34.72 | 0.00 | 34.72 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.327 | 2.333 | 0.000 | 2.436 |
| Crosswalk LOS | B | B | F | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 733 | 133 | 644 | 622 |
| d_b, Bicycle Delay [s] | 18.09 | 39.24 | 20.71 | 21.40 |
| l_b,int, Bicycle LOS Score for Intersection | 1.708 | 1.607 | 1.890 | 1.874 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 40.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.871 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 302 | 601 | 259 | 143 | 1241 | 279 | 183 | 1296 | 361 | 282 | 1143 | 99 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 302 | 601 | 259 | 143 | 1241 | 279 | 183 | 1296 | 361 | 282 | 1143 | 99 |
| Peak Hour Factor | 0.8230 | 0.8230 | 0.8230 | 0.9630 | 0.9630 | 0.9630 | 0.8630 | 0.8630 | 0.8630 | 0.9800 | 0.9800 | 0.9800 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 92 | 183 | 79 | 37 | 322 | 72 | 53 | 375 | 105 | 72 | 292 | 25 |
| Total Analysis Volume [veh/h] | 367 | 730 | 315 | 148 | 1289 | 290 | 212 | 1502 | 418 | 288 | 1166 | 101 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 18 | 46 | 0 | 11 | 39 | 0 | 13 | 48 | 0 | 15 | 50 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 31 | 0 | 0 | 28 | 0 | 0 | 31 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 14 | 39 | 39 | 7 | 31 | 31 | 9 | 47 | 47 | 11 | 49 | 49 |
| g / C, Green / Cycle | 0.12 | 0.32 | 0.32 | 0.06 | 0.26 | 0.26 | 0.08 | 0.40 | 0.40 | 0.09 | 0.41 | 0.41 |
| (v / s)_i Volume / Saturation Flow Rate | 0.10 | 0.13 | 0.17 | 0.04 | 0.23 | 0.15 | 0.06 | 0.34 | 0.33 | 0.08 | 0.20 | 0.05 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 410 | 1827 | 609 | 205 | 1493 | 498 | 265 | 1503 | 751 | 323 | 2349 | 783 |
| d1, Uniform Delay [s] | 52.27 | 31.79 | 33.23 | 55.56 | 42.26 | 38.60 | 54.60 | 33.30 | 32.64 | 53.90 | 26.09 | 21.91 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 7.05 | 0.14 | 0.68 | 4.77 | 1.61 | 1.09 | 5.56 | 6.79 | 10.26 | 8.48 | 0.75 | 0.34 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.90 | 0.40 | 0.52 | 0.72 | 0.86 | 0.58 | 0.80 | 0.86 | 0.83 | 0.89 | 0.50 | 0.13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 59.33 | 31.93 | 33.91 | 60.33 | 43.87 | 39.68 | 60.16 | 40.10 | 42.90 | 62.38 | 26.84 | 22.25 |
| Lane Group LOS | E | C | C | E | D | D | E | D | D | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 5.85 | 5.54 | 7.57 | 2.34 | 12.28 | 7.58 | 3.36 | 18.42 | 18.15 | 4.68 | 8.33 | 1.86 |
| 50th-Percentile Queue Length [ft/ln] | 146.16 | 138.42 | 189.36 | 58.48 | 306.92 | 189.51 | 83.94 | 460.50 | 453.80 | 116.96 | 208.28 | 46.43 |
| 95th-Percentile Queue Length [veh/ln] | 9.81 | 9.40 | 12.09 | 4.21 | 18.02 | 12.10 | 6.04 | 25.46 | 25.14 | 8.23 | 13.07 | 3.34 |
| 95th-Percentile Queue Length [ft/ln] | 245.29 | 234.89 | 302.20 | 105.26 | 450.58 | 302.40 | 151.10 | 636.47 | 628.48 | 205.64 | 326.63 | 83.57 |

**Movement, Approach, & Intersection Results**

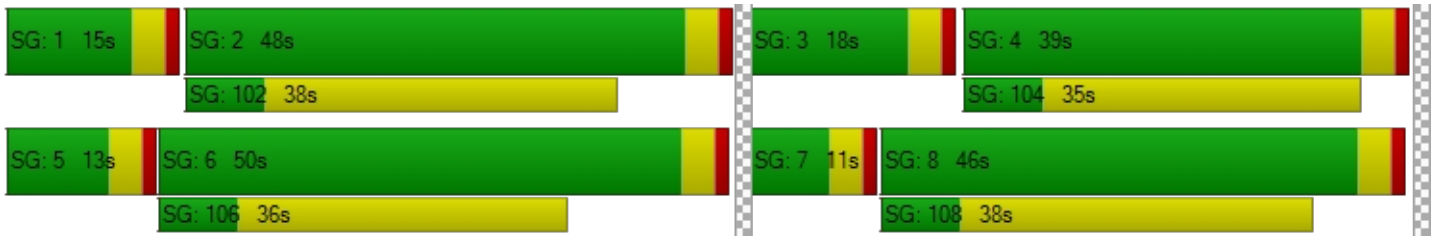
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 59.33 | 31.93 | 33.91 | 60.33 | 43.87 | 39.68 | 60.16 | 40.48 | 42.90 | 62.38 | 26.84 | 22.25 |
| Movement LOS | E | C | C | E | D | D | E | D | D | E | C | C |
| d_A, Approach Delay [s/veh] | 39.49 | | | 44.58 | | | 42.91 | | | 33.12 | | |
| Approach LOS | D | | | D | | | D | | | C | | |
| d_I, Intersection Delay [s/veh] | 40.40 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.871 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 49.52 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.232 | 3.163 | 3.221 | 3.244 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 700 | 583 | 733 | 766 |
| d_b, Bicycle Delay [s] | 25.36 | 30.12 | 24.08 | 22.83 |
| l_b,int, Bicycle LOS Score for Intersection | 2.336 | 2.509 | 2.732 | 2.415 |
| Bicycle LOS | B | B | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 18.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.514 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 59 | 113 | 152 | 120 | 84 | 133 | 218 | 1314 | 78 | 48 | 1195 | 156 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 59 | 113 | 152 | 120 | 84 | 133 | 218 | 1314 | 78 | 48 | 1195 | 156 |
| Peak Hour Factor | 0.8950 | 0.8950 | 0.8950 | 0.8510 | 0.8510 | 0.8510 | 0.8710 | 0.8710 | 0.8710 | 0.9670 | 0.9670 | 0.9670 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 16 | 32 | 42 | 35 | 25 | 39 | 63 | 377 | 22 | 12 | 309 | 40 |
| Total Analysis Volume [veh/h] | 66 | 126 | 170 | 141 | 99 | 156 | 250 | 1509 | 90 | 50 | 1236 | 161 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 39 | 0 | 0 | 39 | 0 | 17 | 31 | 0 | 20 | 34 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 23 | 0 | 0 | 17 | 0 | 0 | 23 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 11 | 11 | 11 | 11 | 11 | 11 | 13 | 63 | 63 | 4 | 54 | 54 |
| g / C, Green / Cycle | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.14 | 0.70 | 0.70 | 0.05 | 0.60 | 0.60 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.07 | 0.09 | 0.08 | 0.03 | 0.08 | 0.14 | 0.28 | 0.28 | 0.03 | 0.22 | 0.08 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 216 | 225 | 225 | 146 | 450 | 225 | 261 | 2659 | 1329 | 88 | 3439 | 1146 |
| d1, Uniform Delay [s] | 36.33 | 37.48 | 38.43 | 37.97 | 35.93 | 38.12 | 38.21 | 5.63 | 5.68 | 41.91 | 9.05 | 7.74 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.79 | 2.18 | 5.11 | 27.06 | 0.24 | 3.81 | 17.46 | 0.45 | 0.93 | 5.70 | 0.29 | 0.26 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.31 | 0.56 | 0.76 | 0.97 | 0.22 | 0.69 | 0.96 | 0.40 | 0.41 | 0.57 | 0.36 | 0.14 |
| d, Delay for Lane Group [s/veh] | 37.12 | 39.66 | 43.55 | 65.03 | 36.17 | 41.93 | 55.67 | 6.08 | 6.61 | 47.61 | 9.34 | 8.00 |
| Lane Group LOS | D | D | D | E | D | D | E | A | A | D | A | A |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 1.36 | 2.72 | 3.90 | 4.03 | 0.99 | 3.50 | 6.64 | 3.54 | 3.83 | 1.21 | 3.79 | 1.32 |
| 50th-Percentile Queue Length [ft/ln] | 34.02 | 68.07 | 97.46 | 100.77 | 24.74 | 87.40 | 165.95 | 88.56 | 95.64 | 30.37 | 94.70 | 32.92 |
| 95th-Percentile Queue Length [veh/ln] | 2.45 | 4.90 | 7.02 | 7.26 | 1.78 | 6.29 | 10.86 | 6.38 | 6.89 | 2.19 | 6.82 | 2.37 |
| 95th-Percentile Queue Length [ft/ln] | 61.24 | 122.53 | 175.43 | 181.38 | 44.53 | 157.31 | 271.59 | 159.41 | 172.16 | 54.67 | 170.45 | 59.26 |

**Movement, Approach, & Intersection Results**

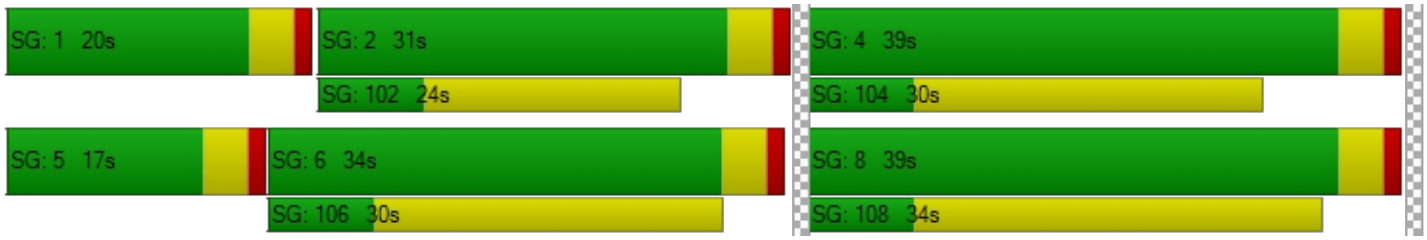
| d_M, Delay for Movement [s/veh] | 37.12 | 39.66 | 43.55 | 65.03 | 36.17 | 41.93 | 55.67 | 6.24 | 6.61 | 47.61 | 9.34 | 8.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | D | D | D | E | D | D | E | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 41.02 | | | 48.72 | | | 12.94 | | | 10.52 | | |
| Approach LOS | D | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 18.08 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.514 | | | | | | | | | | | |

**Other Modes**

| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
|---|---|---|---|---|
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.417 | 2.481 | 3.148 | 3.324 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 778 | 778 | 600 | 666 |
| d_b, Bicycle Delay [s] | 16.82 | 16.82 | 22.06 | 20.01 |
| l_b,int, Bicycle LOS Score for Intersection | 2.157 | 1.886 | 2.577 | 2.355 |
| Bicycle LOS | B | A | B | B |

## Sequence

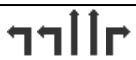
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 40.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.860 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 426 | 452 | 142 | 126 | 944 | 163 | 130 | 1478 | 345 | 150 | 1409 | 63 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 426 | 452 | 142 | 126 | 944 | 163 | 130 | 1478 | 345 | 150 | 1409 | 63 |
| Peak Hour Factor | 0.7960 | 0.7960 | 0.7960 | 0.9500 | 0.9500 | 0.9500 | 0.9210 | 0.9210 | 0.9210 | 0.8690 | 0.8690 | 0.8690 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 134 | 142 | 45 | 33 | 248 | 43 | 35 | 401 | 94 | 43 | 405 | 18 |
| Total Analysis Volume [veh/h] | 535 | 568 | 178 | 133 | 994 | 172 | 141 | 1605 | 375 | 173 | 1621 | 72 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 25 | 57 | 0 | 11 | 43 | 0 | 10 | 41 | 0 | 11 | 42 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 20 | 48 | 48 | 7 | 35 | 35 | 6 | 42 | 42 | 7 | 43 | 43 |
| g / C, Green / Cycle | 0.17 | 0.40 | 0.40 | 0.05 | 0.29 | 0.29 | 0.05 | 0.35 | 0.35 | 0.06 | 0.36 | 0.36 |
| (v / s)_i Volume / Saturation Flow Rate | 0.15 | 0.10 | 0.09 | 0.04 | 0.26 | 0.09 | 0.04 | 0.28 | 0.20 | 0.05 | 0.28 | 0.04 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 592 | 2298 | 766 | 192 | 1098 | 549 | 180 | 1989 | 663 | 209 | 2036 | 679 |
| d1, Uniform Delay [s] | 48.94 | 23.76 | 23.61 | 55.76 | 41.13 | 33.39 | 56.30 | 35.44 | 31.72 | 55.86 | 34.68 | 25.80 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.46 | 0.06 | 0.15 | 4.40 | 3.16 | 0.32 | 7.21 | 3.63 | 3.47 | 8.05 | 3.33 | 0.31 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.90 | 0.25 | 0.23 | 0.69 | 0.91 | 0.31 | 0.78 | 0.81 | 0.57 | 0.83 | 0.80 | 0.11 |
| d, Delay for Lane Group [s/veh] | 54.39 | 23.82 | 23.76 | 60.17 | 44.29 | 33.72 | 63.52 | 39.07 | 35.19 | 63.91 | 38.01 | 26.11 |
| Lane Group LOS | D | C | C | E | D | C | E | D | D | E | D | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 8.29 | 3.59 | 3.37 | 2.10 | 14.50 | 3.99 | 2.29 | 14.67 | 9.42 | 2.83 | 14.61 | 1.45 |
| 50th-Percentile Queue Length [ft/ln] | 207.27 | 89.69 | 84.31 | 52.46 | 362.49 | 99.70 | 57.36 | 366.73 | 235.59 | 70.68 | 365.37 | 36.14 |
| 95th-Percentile Queue Length [veh/ln] | 13.01 | 6.46 | 6.07 | 3.78 | 20.74 | 7.18 | 4.13 | 20.95 | 14.46 | 5.09 | 20.88 | 2.60 |
| 95th-Percentile Queue Length [ft/ln] | 325.32 | 161.45 | 151.76 | 94.43 | 518.61 | 179.47 | 103.24 | 523.76 | 361.45 | 127.22 | 522.11 | 65.05 |

**Movement, Approach, & Intersection Results**

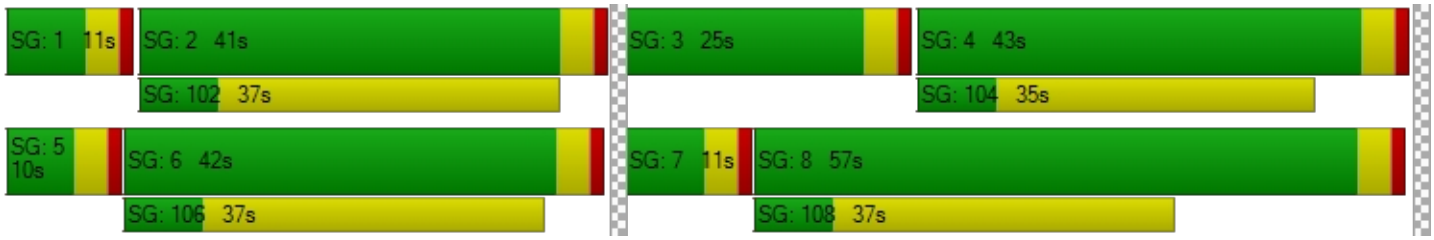
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 54.39 | 23.82 | 23.76 | 60.17 | 44.29 | 33.72 | 63.52 | 39.07 | 35.19 | 63.91 | 38.01 | 26.11 |
| Movement LOS | D | C | C | E | D | C | E | D | D | E | D | C |
| d_A, Approach Delay [s/veh] | 36.58 | | | 44.51 | | | 40.01 | | | 39.96 | | |
| Approach LOS | D | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 40.22 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.860 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.083 | 2.993 | 3.345 | 3.273 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 883 | 650 | 616 | 633 |
| d_b, Bicycle Delay [s] | 18.73 | 27.37 | 28.73 | 28.04 |
| l_b,int, Bicycle LOS Score for Intersection | 2.264 | 2.631 | 2.726 | 2.586 |
| Bicycle LOS | B | B | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 12.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.481 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 15 | 14 | 53 | 125 | 14 | 29 | 58 | 1516 | 9 | 24 | 1466 | 143 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 15 | 14 | 53 | 125 | 14 | 29 | 58 | 1516 | 9 | 24 | 1466 | 143 |
| Peak Hour Factor | 0.7700 | 0.7700 | 0.7700 | 0.8070 | 0.8070 | 0.8070 | 0.8950 | 0.8950 | 0.8950 | 0.8510 | 0.8510 | 0.8510 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 5 | 5 | 17 | 39 | 4 | 9 | 16 | 423 | 3 | 7 | 431 | 42 |
| Total Analysis Volume [veh/h] | 19 | 18 | 69 | 155 | 17 | 36 | 65 | 1694 | 10 | 28 | 1723 | 168 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 10 | 0 | 0 | 40 | 0 | 10 | 40 | 0 | 10 | 40 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 28 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 6 | 6 | 7 | 7 | 5 | 68 | 68 | 3 | 66 | 66 |
| g / C, Green / Cycle | 0.06 | 0.06 | 0.06 | 0.07 | 0.07 | 0.05 | 0.68 | 0.68 | 0.03 | 0.66 | 0.66 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.01 | 0.04 | 0.04 | 0.03 | 0.02 | 0.29 | 0.31 | 0.02 | 0.30 | 0.09 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 3500 | 1900 | 3500 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 104 | 104 | 110 | 243 | 132 | 179 | 2582 | 1291 | 61 | 3772 | 1257 |
| d1, Uniform Delay [s] | 44.92 | 44.90 | 46.12 | 45.37 | 44.61 | 45.93 | 7.29 | 7.44 | 47.50 | 8.21 | 6.28 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.83 | 0.78 | 5.79 | 2.78 | 1.97 | 1.23 | 0.53 | 1.15 | 5.40 | 0.40 | 0.22 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.18 | 0.17 | 0.63 | 0.64 | 0.40 | 0.36 | 0.43 | 0.45 | 0.46 | 0.46 | 0.13 |
| d, Delay for Lane Group [s/veh] | 45.76 | 45.68 | 51.91 | 48.15 | 46.57 | 47.16 | 7.82 | 8.59 | 52.90 | 8.61 | 6.50 |
| Lane Group LOS | D | D | D | D | D | D | A | A | D | A | A |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.47 | 0.45 | 1.85 | 1.96 | 1.33 | 0.81 | 4.94 | 5.48 | 0.77 | 5.47 | 1.27 |
| 50th-Percentile Queue Length [ft/ln] | 11.80 | 11.16 | 46.16 | 48.96 | 33.15 | 20.22 | 123.40 | 137.09 | 19.33 | 136.83 | 31.78 |
| 95th-Percentile Queue Length [veh/ln] | 0.85 | 0.80 | 3.32 | 3.53 | 2.39 | 1.46 | 8.58 | 9.32 | 1.39 | 9.31 | 2.29 |
| 95th-Percentile Queue Length [ft/ln] | 21.23 | 20.09 | 83.08 | 88.13 | 59.66 | 36.40 | 214.49 | 233.11 | 34.80 | 232.75 | 57.20 |

**Movement, Approach, & Intersection Results**

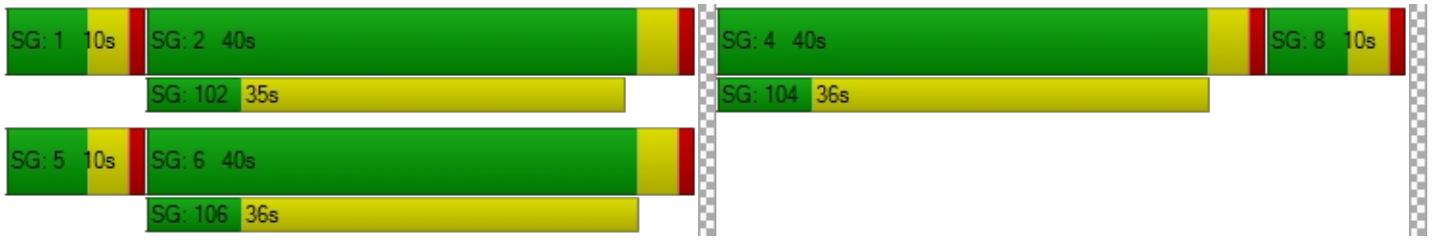
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 45.76 | 45.68 | 51.91 | 48.15 | 46.57 | 46.57 | 47.16 | 8.09 | 8.59 | 52.90 | 8.61 | 6.50 |
| Movement LOS | D | D | D | D | D | D | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 49.75 | | | 47.75 | | | 9.52 | | | 9.07 | | |
| Approach LOS | D | | | D | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 12.36 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.481 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 39.64 | 39.64 | 39.64 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.175 | 2.394 | 3.163 | 0.000 |
| Crosswalk LOS | B | B | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 120 | 719 | 719 | 719 |
| d_b, Bicycle Delay [s] | 44.22 | 20.51 | 20.51 | 20.51 |
| l_b,int, Bicycle LOS Score for Intersection | 1.647 | 1.903 | 2.533 | 2.615 |
| Bicycle LOS | A | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 30.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.781 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 97 | 137 | 397 | 84 | 341 | 26 | 33 | 1518 | 171 | 431 | 1517 | 134 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 97 | 137 | 397 | 84 | 341 | 26 | 33 | 1518 | 171 | 431 | 1517 | 134 |
| Peak Hour Factor | 0.9050 | 0.9050 | 0.9050 | 0.9420 | 0.9420 | 0.9420 | 0.9090 | 0.9090 | 0.9090 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 27 | 38 | 110 | 22 | 90 | 7 | 9 | 417 | 47 | 120 | 421 | 37 |
| Total Analysis Volume [veh/h] | 107 | 151 | 439 | 89 | 362 | 28 | 36 | 1670 | 188 | 479 | 1686 | 149 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 105 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 12 | 41 | 0 | 10 | 39 | 0 | 15 | 34 | 0 | 20 | 39 | 39 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 23 | 0 | 0 | 23 | 23 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 6 | 27 | 27 | 6 | 27 | 27 | 4 | 40 | 40 | 16 | 52 | 62 |
| g / C, Green / Cycle | 0.06 | 0.26 | 0.26 | 0.06 | 0.26 | 0.26 | 0.04 | 0.38 | 0.38 | 0.15 | 0.50 | 0.59 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.04 | 0.23 | 0.04 | 0.10 | 0.10 | 0.01 | 0.24 | 0.25 | 0.14 | 0.30 | 0.08 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 2000 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 194 | 972 | 486 | 116 | 491 | 491 | 134 | 2173 | 724 | 535 | 2826 | 1124 |
| d1, Uniform Delay [s] | 48.36 | 30.31 | 37.85 | 48.82 | 32.25 | 32.18 | 49.12 | 26.57 | 26.83 | 43.71 | 18.98 | 9.51 |
| k, delay calibration | 0.11 | 0.11 | 0.21 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 2.42 | 0.07 | 11.31 | 10.11 | 0.53 | 0.51 | 1.07 | 1.44 | 4.59 | 5.60 | 0.94 | 0.24 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.55 | 0.16 | 0.90 | 0.77 | 0.40 | 0.39 | 0.27 | 0.64 | 0.66 | 0.90 | 0.60 | 0.13 |
| d, Delay for Lane Group [s/veh] | 50.79 | 30.38 | 49.16 | 58.92 | 32.78 | 32.70 | 50.19 | 28.01 | 31.42 | 49.32 | 19.92 | 9.75 |
| Lane Group LOS | D | C | D | E | C | C | D | C | C | D | B | A |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 1.43 | 1.49 | 12.28 | 1.31 | 4.19 | 4.10 | 0.48 | 9.52 | 10.51 | 6.48 | 9.67 | 1.53 |
| 50th-Percentile Queue Length [ft/ln] | 35.70 | 37.27 | 307.01 | 32.73 | 104.80 | 102.61 | 11.95 | 237.95 | 262.85 | 161.95 | 241.67 | 38.35 |
| 95th-Percentile Queue Length [veh/ln] | 2.57 | 2.68 | 18.03 | 2.36 | 7.55 | 7.39 | 0.86 | 14.58 | 15.83 | 10.65 | 14.77 | 2.76 |
| 95th-Percentile Queue Length [ft/ln] | 64.26 | 67.08 | 450.68 | 58.92 | 188.64 | 184.69 | 21.51 | 364.45 | 395.80 | 266.30 | 369.14 | 69.02 |

**Movement, Approach, & Intersection Results**

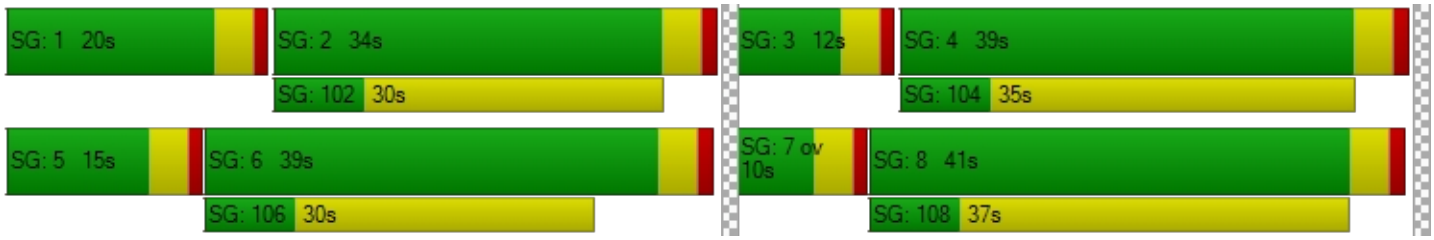
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 50.79 | 30.38 | 49.16 | 58.92 | 32.74 | 32.70 | 50.19 | 28.60 | 31.42 | 49.32 | 19.92 | 9.75 |
| Movement LOS | D | C | D | E | C | C | D | C | C | D | B | A |
| d_A, Approach Delay [s/veh] | 45.34 | | | 37.61 | | | 29.29 | | | 25.35 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 30.41 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.781 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 42.11 | 42.11 | 42.11 | 42.11 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.842 | 2.593 | 3.259 | 3.414 |
| Crosswalk LOS | C | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 704 | 666 | 571 | 666 |
| d_b, Bicycle Delay [s] | 22.05 | 23.36 | 26.81 | 23.36 |
| l_b,int, Bicycle LOS Score for Intersection | 2.135 | 1.955 | 2.341 | 2.832 |
| Bicycle LOS | B | A | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 15.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.582 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 574 | 0 | 460 | 0 | 1410 | 639 | 0 | 1645 | 180 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 574 | 0 | 460 | 0 | 1410 | 639 | 0 | 1645 | 180 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 0.8810 | 1.0000 | 0.8810 | 1.0000 | 0.9270 | 0.9270 | 1.0000 | 0.9400 | 0.9400 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 163 | 0 | 131 | 0 | 380 | 172 | 0 | 438 | 48 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 652 | 0 | 522 | 0 | 1521 | 689 | 0 | 1750 | 191 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 8.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 64 | 0 | 0 | 0 | 26 | 0 | 0 | 26 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | | No | |
| Maximum Recall | | | | No | | | | No | | | No | |
| Pedestrian Recall | | | | No | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | C | R | C | C |
|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 24 | 24 | 24 | 58 | 58 |
| g / C, Green / Cycle | | 0.27 | 0.27 | 0.27 | 0.64 | 0.64 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.22 | 0.22 | 0.21 | 0.27 | 0.31 |
| s, saturation flow rate [veh/h] | | 1750 | 1750 | 1900 | 5700 | 5700 |
| c, Capacity [veh/h] | | 471 | 471 | 512 | 3657 | 3657 |
| d1, Uniform Delay [s] | | 30.88 | 30.88 | 30.20 | 7.87 | 8.33 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 3.84 | 3.84 | 2.41 | 0.35 | 0.45 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.83 | 0.83 | 0.76 | 0.42 | 0.48 |
| d, Delay for Lane Group [s/veh] | | 34.72 | 34.72 | 32.61 | 8.22 | 8.78 |
| Lane Group LOS | | C | C | C | A | A |
| Critical Lane Group | | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | | 8.24 | 8.24 | 7.91 | 4.32 | 5.27 |
| 50th-Percentile Queue Length [ft/ln] | | 206.00 | 206.00 | 197.71 | 108.07 | 131.76 |
| 95th-Percentile Queue Length [veh/ln] | | 12.95 | 12.95 | 12.52 | 7.73 | 9.04 |
| 95th-Percentile Queue Length [ft/ln] | | 323.69 | 323.69 | 313.01 | 193.32 | 225.89 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 34.72 | 0.00 | 33.14 | 0.00 | 8.22 | 0.00 | 0.00 | 8.78 | 0.00 |
| Movement LOS | | | | C | | C | | A | | | A | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 34.02 | | | 8.22 | | | 8.78 | | |
| Approach LOS | A | | | C | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 15.25 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.582 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 0.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 0.00 | 34.63 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 0.000 | 2.417 | 0.000 | 0.000 |
| Crosswalk LOS | F | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 1335 | 489 | 489 |
| d_b, Bicycle Delay [s] | 44.96 | 4.98 | 25.65 | 25.65 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 3.497 | 2.396 | 2.522 |
| Bicycle LOS | D | C | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 21.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.630 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 831 | 43 | 783 | 0 | 0 | 50 | 116 | 1281 | 531 | 0 | 1400 | 18 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 831 | 43 | 783 | 0 | 0 | 50 | 116 | 1281 | 531 | 0 | 1400 | 18 |
| Peak Hour Factor | 0.9080 | 0.9080 | 0.9080 | 1.0000 | 1.0000 | 0.6820 | 0.8790 | 0.8790 | 0.8790 | 1.0000 | 0.8940 | 0.8940 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 229 | 12 | 216 | 0 | 0 | 18 | 33 | 364 | 151 | 0 | 391 | 5 |
| Total Analysis Volume [veh/h] | 915 | 47 | 862 | 0 | 0 | 73 | 132 | 1457 | 604 | 0 | 1566 | 20 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 0 | 6 | 6 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 47 | 0 | 0 | 0 | 13 | 13 | 43 | 0 | 0 | 30 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | | No | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | | No | No | No | | | No | |
| Maximum Recall | | No | | | | No | No | No | | | No | |
| Pedestrian Recall | | No | | | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 30 | 30 | 30 | 8 | 8 | 52 | 40 | 40 |
| g / C, Green / Cycle | 0.33 | 0.33 | 0.33 | 0.09 | 0.09 | 0.58 | 0.44 | 0.44 |
| (v / s)_i Volume / Saturation Flow Rate | 0.26 | 0.26 | 0.24 | 0.02 | 0.07 | 0.26 | 0.21 | 0.21 |
| s, saturation flow rate [veh/h] | 3500 | 1750 | 1900 | 3800 | 1800 | 5700 | 5700 | 1900 |
| c, Capacity [veh/h] | 1161 | 580 | 630 | 349 | 165 | 3304 | 2528 | 843 |
| d1, Uniform Delay [s] | 27.06 | 27.35 | 26.59 | 37.87 | 40.08 | 10.69 | 17.62 | 17.62 |
| k, delay calibration | 0.11 | 0.13 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.14 | 3.09 | 1.68 | 0.30 | 8.58 | 0.43 | 0.63 | 1.88 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.77 | 0.80 | 0.73 | 0.21 | 0.80 | 0.44 | 0.47 | 0.47 |
| d, Delay for Lane Group [s/veh] | 28.20 | 30.44 | 28.28 | 38.17 | 48.66 | 11.12 | 18.26 | 19.51 |
| Lane Group LOS | C | C | C | D | D | B | B | B |
| Critical Lane Group | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 8.55 | 9.20 | 8.76 | 0.75 | 3.22 | 5.11 | 5.67 | 5.96 |
| 50th-Percentile Queue Length [ft/ln] | 213.65 | 230.01 | 218.92 | 18.81 | 80.48 | 127.67 | 141.75 | 149.08 |
| 95th-Percentile Queue Length [veh/ln] | 13.34 | 14.17 | 13.61 | 1.35 | 5.79 | 8.81 | 9.58 | 9.97 |
| 95th-Percentile Queue Length [ft/ln] | 333.51 | 354.37 | 340.25 | 33.87 | 144.86 | 220.32 | 239.38 | 249.20 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 28.21 | 30.44 | 29.29 | 0.00 | 0.00 | 38.17 | 48.66 | 11.12 | 0.00 | 0.00 | 18.56 | 19.51 |
| Movement LOS | C | C | C | | | D | D | B | | | B | B |
| d_A, Approach Delay [s/veh] | 28.79 | | | 38.17 | | | 14.24 | | | 18.57 | | |
| Approach LOS | C | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 21.17 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.630 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.655 | 2.028 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 955 | 200 | 866 | 578 |
| d_b, Bicycle Delay [s] | 12.28 | 36.46 | 14.46 | 22.77 |
| l_b,int, Bicycle LOS Score for Intersection | 4.569 | 1.560 | 2.434 | 2.214 |
| Bicycle LOS | E | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 27.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.773 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 144 | 202 | 69 | 145 | 320 | 143 | 145 | 1794 | 97 | 89 | 1538 | 82 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 144 | 202 | 69 | 145 | 320 | 143 | 145 | 1794 | 97 | 89 | 1538 | 82 |
| Peak Hour Factor | 0.8870 | 0.8870 | 0.8870 | 0.9320 | 0.9320 | 0.9320 | 0.9120 | 0.9120 | 0.9120 | 0.9620 | 0.9620 | 0.9620 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 41 | 57 | 19 | 39 | 86 | 38 | 40 | 492 | 27 | 23 | 400 | 21 |
| Total Analysis Volume [veh/h] | 162 | 228 | 78 | 156 | 343 | 153 | 159 | 1967 | 106 | 93 | 1599 | 85 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 10 | 39 | 0 | 11 | 40 | 0 | 14 | 40 | 0 | 10 | 36 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 29 | 0 | 0 | 26 | 0 | 0 | 25 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 20 | 20 | 6 | 21 | 21 | 10 | 51 | 51 | 6 | 47 | 47 |
| g / C, Green / Cycle | 0.06 | 0.20 | 0.20 | 0.06 | 0.21 | 0.21 | 0.10 | 0.51 | 0.51 | 0.06 | 0.47 | 0.47 |
| (v / s)_i Volume / Saturation Flow Rate | 0.05 | 0.08 | 0.08 | 0.04 | 0.18 | 0.08 | 0.09 | 0.36 | 0.37 | 0.05 | 0.22 | 0.23 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 213 | 387 | 387 | 224 | 393 | 393 | 181 | 1944 | 972 | 110 | 2690 | 897 |
| d1, Uniform Delay [s] | 46.31 | 34.64 | 34.44 | 45.90 | 38.44 | 34.26 | 44.42 | 18.66 | 18.98 | 46.57 | 17.86 | 18.19 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.52 | 0.69 | 0.62 | 3.85 | 6.13 | 0.63 | 12.55 | 2.16 | 4.71 | 16.14 | 0.57 | 1.93 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.76 | 0.41 | 0.38 | 0.70 | 0.87 | 0.39 | 0.88 | 0.70 | 0.73 | 0.85 | 0.46 | 0.49 |
| d, Delay for Lane Group [s/veh] | 51.82 | 35.33 | 35.06 | 49.75 | 44.57 | 34.89 | 56.97 | 20.82 | 23.69 | 62.71 | 18.43 | 20.12 |
| Lane Group LOS | D | D | D | D | D | C | E | C | C | E | B | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.14 | 3.39 | 3.16 | 2.01 | 8.69 | 3.26 | 4.49 | 11.98 | 13.22 | 2.77 | 6.38 | 7.25 |
| 50th-Percentile Queue Length [ft/ln] | 53.41 | 84.86 | 78.94 | 50.24 | 217.36 | 81.48 | 112.25 | 299.39 | 330.49 | 69.24 | 159.41 | 181.13 |
| 95th-Percentile Queue Length [veh/ln] | 3.85 | 6.11 | 5.68 | 3.62 | 13.53 | 5.87 | 7.97 | 17.65 | 19.18 | 4.98 | 10.52 | 11.66 |
| 95th-Percentile Queue Length [ft/ln] | 96.14 | 152.75 | 142.10 | 90.42 | 338.26 | 146.66 | 199.13 | 441.28 | 479.56 | 124.62 | 262.95 | 291.49 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 51.82 | 35.25 | 35.06 | 49.75 | 44.57 | 34.89 | 56.97 | 21.69 | 23.69 | 62.71 | 18.81 | 20.12 |
| Movement LOS | D | D | D | D | D | C | E | C | C | E | B | C |
| d_A, Approach Delay [s/veh] | 40.96 | | | 43.54 | | | 24.30 | | | 21.17 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 27.18 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.773 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 39.64 | 39.64 | 39.64 | 39.64 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.502 | 2.640 | 3.236 | 3.215 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 700 | 719 | 719 | 640 |
| d_b, Bicycle Delay [s] | 21.16 | 20.51 | 20.51 | 23.15 |
| l_b,int, Bicycle LOS Score for Intersection | 1.946 | 2.635 | 2.787 | 2.293 |
| Bicycle LOS | A | B | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 18.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.669 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 168 | 12 | 141 | 24 | 27 | 14 | 13 | 1756 | 347 | 170 | 1406 | 32 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 168 | 12 | 141 | 24 | 27 | 14 | 13 | 1756 | 347 | 170 | 1406 | 32 |
| Peak Hour Factor | 0.8320 | 0.8320 | 0.8320 | 0.6740 | 0.6740 | 0.6740 | 0.9510 | 0.9510 | 0.9510 | 0.8930 | 0.8930 | 0.8930 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 50 | 4 | 42 | 9 | 10 | 5 | 3 | 462 | 91 | 48 | 394 | 9 |
| Total Analysis Volume [veh/h] | 202 | 14 | 169 | 36 | 40 | 21 | 14 | 1846 | 365 | 190 | 1574 | 36 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 26 | 0 | 0 | 10 | 0 | 10 | 32 | 0 | 22 | 44 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 14 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 11 | 11 | 11 | 6 | 6 | 2 | 46 | 46 | 11 | 56 | 56 |
| g / C, Green / Cycle | 0.12 | 0.12 | 0.12 | 0.06 | 0.06 | 0.02 | 0.52 | 0.52 | 0.13 | 0.62 | 0.62 |
| (v / s)_i Volume / Saturation Flow Rate | 0.06 | 0.06 | 0.09 | 0.02 | 0.03 | 0.01 | 0.32 | 0.19 | 0.11 | 0.28 | 0.29 |
| s, saturation flow rate [veh/h] | 1750 | 1750 | 1900 | 1800 | 1900 | 1800 | 5700 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 207 | 207 | 224 | 111 | 118 | 38 | 2934 | 978 | 230 | 2362 | 1181 |
| d1, Uniform Delay [s] | 37.38 | 37.39 | 38.50 | 40.49 | 41.00 | 43.55 | 15.70 | 13.14 | 38.34 | 8.95 | 9.09 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 2.03 | 2.06 | 5.08 | 1.66 | 3.51 | 5.86 | 1.03 | 1.09 | 7.30 | 0.62 | 1.32 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.52 | 0.52 | 0.75 | 0.32 | 0.52 | 0.37 | 0.63 | 0.37 | 0.83 | 0.45 | 0.47 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 39.41 | 39.45 | 43.58 | 42.15 | 44.50 | 49.41 | 16.74 | 14.23 | 45.63 | 9.57 | 10.41 |
| Lane Group LOS | D | D | D | D | D | D | B | B | D | A | B |
| Critical Lane Group | No | No | Yes | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.32 | 2.33 | 3.88 | 0.81 | 1.41 | 0.37 | 8.68 | 4.47 | 4.49 | 5.02 | 5.51 |
| 50th-Percentile Queue Length [ft/ln] | 57.98 | 58.36 | 96.92 | 20.21 | 35.33 | 9.18 | 216.95 | 111.63 | 112.33 | 125.39 | 137.79 |
| 95th-Percentile Queue Length [veh/ln] | 4.17 | 4.20 | 6.98 | 1.45 | 2.54 | 0.66 | 13.51 | 7.93 | 7.97 | 8.69 | 9.36 |
| 95th-Percentile Queue Length [ft/ln] | 104.36 | 105.05 | 174.46 | 36.37 | 63.59 | 16.52 | 337.73 | 198.27 | 199.23 | 217.21 | 234.04 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 39.43 | 39.45 | 43.58 | 42.15 | 44.50 | 44.50 | 49.41 | 16.74 | 14.23 | 45.63 | 9.85 | 10.41 |
| Movement LOS | D | D | D | D | D | D | D | B | B | D | A | B |
| d_A, Approach Delay [s/veh] | 41.25 | | | 43.63 | | | 16.53 | | | 13.64 | | |
| Approach LOS | D | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 18.07 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.669 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.72 | 34.72 | 0.00 | 34.72 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.370 | 1.992 | 0.000 | 3.130 |
| Crosswalk LOS | B | A | F | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 488 | 133 | 622 | 888 |
| d_b, Bicycle Delay [s] | 25.73 | 39.24 | 21.40 | 13.92 |
| l_b,int, Bicycle LOS Score for Intersection | 2.195 | 1.720 | 2.783 | 2.550 |
| Bicycle LOS | B | A | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



Brea Mall Expansion, Brea

Vistro File: N:\...\4099 HCM Network.vistro
Report File: N:\...\PM Ex.pdf

Scenario 2 PM Existing
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | HCM 6th Edition | WB Left | 0.741 | 36.3 | D |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | HCM 6th Edition | WB Left | 0.663 | 19.5 | B |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | HCM 6th Edition | EB Left | 0.633 | 19.9 | B |
| 4 | Randolph Avenue at Birch Street | Signalized | HCM 6th Edition | NB Left | 0.501 | 30.1 | C |
| 5 | State College Boulevard at Birch Street | Signalized | HCM 6th Edition | NB Left | 0.716 | 30.6 | C |
| 6 | S Associated Road at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.661 | 25.6 | C |
| 7 | Randolph Avenue at Madison Way | Signalized | HCM 6th Edition | WB Left | 0.185 | 19.0 | B |
| 8 | Randolph Avenue at Brea Mall | Signalized | HCM 6th Edition | EB Left | 0.333 | 18.3 | B |
| 9 | Brea Mall South at State College Boulevard | Signalized | HCM 6th Edition | WB Left | 0.600 | 30.7 | C |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | HCM 6th Edition | NB Left | 0.812 | 41.7 | D |
| 11 | Puente Street at Imperial Highway | Signalized | HCM 6th Edition | EB Left | 0.625 | 18.5 | B |
| 12 | Brea Boulevard at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.797 | 37.5 | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.694 | 23.4 | C |
| 14 | State College Boulevard at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.960 | 56.0 | E |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.691 | 15.9 | B |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | HCM 6th Edition | EB Left | 0.731 | 22.5 | C |
| 17 | Associated Road at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.850 | 40.7 | D |
| 18 | Castlegate Lane/Placentia | Signalized | HCM 6th | EB Left | 0.782 | 24.0 | C |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | Edition | EB Left | 0.782 | 24.0 | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 36.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.741 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 302 | 576 | 253 | 545 | 372 | 15 | 38 | 1140 | 245 | 316 | 1008 | 686 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 302 | 576 | 253 | 545 | 372 | 15 | 38 | 1140 | 245 | 316 | 1008 | 686 |
| Peak Hour Factor | 0.9470 | 0.9470 | 0.9470 | 0.9220 | 0.9220 | 0.9220 | 0.8360 | 0.8360 | 0.8360 | 0.9740 | 0.9740 | 0.9740 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 80 | 152 | 67 | 148 | 101 | 4 | 11 | 341 | 73 | 81 | 259 | 176 |
| Total Analysis Volume [veh/h] | 319 | 608 | 267 | 591 | 403 | 16 | 45 | 1364 | 293 | 324 | 1035 | 704 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 20 | 36 | 0 | 28 | 44 | 0 | 10 | 39 | 0 | 17 | 46 | 46 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 28 | 0 | 0 | 22 | 22 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 13 | 23 | 23 | 23 | 24 | 34 | 34 | 5 | 44 | 44 | 13 | 53 | 81 |
| g / C, Green / Cycle | 0.11 | 0.19 | 0.19 | 0.19 | 0.20 | 0.28 | 0.28 | 0.04 | 0.37 | 0.37 | 0.11 | 0.44 | 0.67 |
| (v / s)_i Volume / Saturation Flow Rate | 0.09 | 0.16 | 0.16 | 0.14 | 0.17 | 0.11 | 0.11 | 0.01 | 0.22 | 0.21 | 0.09 | 0.18 | 0.37 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1900 | 3500 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 382 | 358 | 358 | 358 | 700 | 531 | 531 | 139 | 2108 | 703 | 379 | 2498 | 1276 |
| d1, Uniform Delay [s] | 52.42 | 47.13 | 47.10 | 45.86 | 46.21 | 35.05 | 34.99 | 56.08 | 30.53 | 30.36 | 52.61 | 23.14 | 10.28 |
| k, delay calibration | 0.11 | 0.16 | 0.16 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.84 | 8.58 | 8.42 | 2.91 | 2.88 | 0.48 | 0.47 | 1.33 | 1.23 | 3.48 | 5.58 | 0.51 | 1.72 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.84 | 0.86 | 0.85 | 0.73 | 0.84 | 0.40 | 0.39 | 0.32 | 0.59 | 0.58 | 0.86 | 0.41 | 0.55 |
| d, Delay for Lane Group [s/veh] | 57.27 | 55.71 | 55.52 | 48.77 | 49.10 | 35.53 | 35.46 | 57.41 | 31.77 | 33.83 | 58.19 | 23.65 | 12.00 |
| Lane Group LOS | E | E | E | D | D | D | D | E | C | C | E | C | B |
| Critical Lane Group | No | Yes | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 4.97 | 9.69 | 9.65 | 7.66 | 8.74 | 5.09 | 5.01 | 0.69 | 9.90 | 10.08 | 5.09 | 6.79 | 9.60 |
| 50th-Percentile Queue Length [ft/ln] | 124.1 | 242.2 | 241.2 | 191.4 | 218.45 | 127.13 | 125.21 | 17.25 | 247.55 | 252.07 | 127.21 | 169.70 | 240.12 |
| 95th-Percentile Queue Length [veh/ln] | 8.62 | 14.80 | 14.74 | 12.19 | 13.59 | 8.78 | 8.68 | 1.24 | 15.06 | 15.29 | 8.79 | 11.06 | 14.69 |
| 95th-Percentile Queue Length [ft/ln] | 215.4 | 369.9 | 368.5 | 304.8 | 339.64 | 219.58 | 216.96 | 31.06 | 376.56 | 382.26 | 219.70 | 276.52 | 367.19 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 57.27 | 55.62 | 48.77 | 49.10 | 35.50 | 35.46 | 57.41 | 31.94 | 33.83 | 58.19 | 23.65 | 12.00 |
| Movement LOS | E | E | D | D | D | D | E | C | C | E | C | B |
| d_A, Approach Delay [s/veh] | 54.55 | | | 43.46 | | | 32.94 | | | 25.10 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 36.33 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.741 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.916 | 2.851 | 3.196 | 0.000 |
| Crosswalk LOS | C | C | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 533 | 666 | 583 | 700 |
| d_b, Bicycle Delay [s] | 32.28 | 26.68 | 30.12 | 25.36 |
| l_b,int, Bicycle LOS Score for Intersection | 2.545 | 2.393 | 2.262 | 2.694 |
| Bicycle LOS | B | B | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 19.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.663 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 443 | 0 | 697 | 0 | 1115 | 746 | 226 | 1610 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 443 | 0 | 697 | 0 | 1115 | 746 | 226 | 1610 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 0.9480 | 1.0000 | 0.9480 | 1.0000 | 0.8820 | 0.8820 | 0.9530 | 0.9530 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 117 | 0 | 184 | 0 | 316 | 211 | 59 | 422 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 467 | 0 | 735 | 0 | 1264 | 846 | 237 | 1689 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 45 | 0 | 0 | 0 | 33 | 0 | 12 | 45 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 14 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | No | No | |
| Maximum Recall | | | | No | | | | No | | No | No | |
| Pedestrian Recall | | | | No | | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | C | R | C | C | R | L | C |
|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 25 | 25 | 25 | 45 | 45 | 45 | 8 | 57 |
| g / C, Green / Cycle | | 0.28 | 0.28 | 0.28 | 0.50 | 0.50 | 0.50 | 0.09 | 0.64 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.23 | 0.23 | 0.21 | 0.28 | 0.28 | 0.28 | 0.07 | 0.30 |
| s, saturation flow rate [veh/h] | | 1750 | 1750 | 1900 | 3800 | 1900 | 1900 | 3500 | 5700 |
| c, Capacity [veh/h] | | 483 | 483 | 524 | 1907 | 953 | 953 | 311 | 3620 |
| d1, Uniform Delay [s] | | 30.61 | 30.61 | 29.91 | 15.47 | 15.47 | 15.47 | 40.08 | 8.52 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.50 | 0.11 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 3.73 | 3.73 | 2.35 | 1.16 | 2.31 | 2.31 | 3.84 | 0.43 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | | 0.83 | 0.83 | 0.76 | 0.55 | 0.55 | 0.55 | 0.76 | 0.47 |
|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | | 34.34 | 34.34 | 32.25 | 16.64 | 17.79 | 17.79 | 43.92 | 8.95 |
| Lane Group LOS | | C | C | C | B | B | B | D | A |
| Critical Lane Group | | Yes | No | No | Yes | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | | 8.41 | 8.41 | 8.07 | 7.29 | 7.60 | 7.60 | 2.70 | 5.14 |
| 50th-Percentile Queue Length [ft/ln] | | 210.30 | 210.30 | 201.80 | 182.28 | 189.90 | 189.90 | 67.41 | 128.38 |
| 95th-Percentile Queue Length [veh/ln] | | 13.17 | 13.17 | 12.73 | 11.72 | 12.12 | 12.12 | 4.85 | 8.85 |
| 95th-Percentile Queue Length [ft/ln] | | 329.22 | 329.22 | 318.28 | 293.00 | 302.89 | 302.89 | 121.33 | 221.29 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 34.34 | 0.00 | 33.20 | 0.00 | 16.64 | 17.79 | 43.92 | 8.95 | 0.00 |
| Movement LOS | | | | C | | C | | B | B | D | A | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 33.65 | | | 17.21 | | | 13.25 | | |
| Approach LOS | A | | | C | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 19.53 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.663 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.242 | 2.330 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 911 | 644 | 911 |
| d_b, Bicycle Delay [s] | 45.01 | 13.35 | 20.68 | 13.35 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 3.543 | 2.720 | 2.619 |
| Bicycle LOS | D | D | B | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 19.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.633 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | | | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 636 | 0 | 260 | 0 | 0 | 0 | 356 | 1407 | 0 | 0 | 1024 | 511 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 636 | 0 | 260 | 0 | 0 | 0 | 356 | 1407 | 0 | 0 | 1024 | 511 |
| Peak Hour Factor | 0.8400 | 1.0000 | 0.8400 | 1.0000 | 1.0000 | 1.0000 | 0.8440 | 0.8440 | 1.0000 | 1.0000 | 0.9530 | 0.9530 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 189 | 0 | 77 | 0 | 0 | 0 | 105 | 417 | 0 | 0 | 269 | 134 |
| Total Analysis Volume [veh/h] | 757 | 0 | 310 | 0 | 0 | 0 | 422 | 1667 | 0 | 0 | 1075 | 536 |
| Presence of On-Street Parking | No | | No | | | | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 6 | 0 | 0 | 0 | 0 | 0 | 6 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 0 | 0 | 0 | 0 | 0 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 47 | 0 | 0 | 0 | 0 | 0 | 22 | 43 | 0 | 0 | 21 | 0 |
| Vehicle Extension [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 10 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | No | | | | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | | | | | | No | No | | | No | |
| Maximum Recall | No | | | | | | No | No | | | No | |
| Pedestrian Recall | No | | | | | | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | R | | L | C | C | C | R |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 24 | 24 | | 13 | 58 | 41 | 41 | 41 |
| g / C, Green / Cycle | 0.26 | 0.26 | | 0.15 | 0.65 | 0.46 | 0.46 | 0.46 |
| (v / s)_i Volume / Saturation Flow Rate | 0.22 | 0.16 | | 0.12 | 0.29 | 0.21 | 0.21 | 0.21 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | | 3500 | 5700 | 3800 | 1900 | 1900 |
| c, Capacity [veh/h] | 922 | 501 | | 515 | 3691 | 1733 | 867 | 867 |
| d1, Uniform Delay [s] | 31.16 | 29.18 | | 37.24 | 7.90 | 16.90 | 16.90 | 16.90 |
| k, delay calibration | 0.11 | 0.11 | | 0.11 | 0.50 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.89 | 1.25 | | 3.30 | 0.40 | 0.90 | 1.79 | 1.79 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.82 | 0.62 | | 0.82 | 0.45 | 0.46 | 0.46 | 0.46 |
| d, Delay for Lane Group [s/veh] | 33.04 | 30.43 | | 40.54 | 8.30 | 17.80 | 18.69 | 18.69 |
| Lane Group LOS | C | C | | D | A | B | B | B |
| Critical Lane Group | Yes | No | | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 7.74 | 5.93 | | 4.66 | 4.79 | 5.69 | 5.90 | 5.90 |
| 50th-Percentile Queue Length [ft/ln] | 193.62 | 148.24 | | 116.57 | 119.74 | 142.21 | 147.58 | 147.58 |
| 95th-Percentile Queue Length [veh/ln] | 12.31 | 9.92 | | 8.20 | 8.38 | 9.60 | 9.89 | 9.89 |
| 95th-Percentile Queue Length [ft/ln] | 307.72 | 248.08 | | 205.11 | 209.47 | 240.00 | 247.19 | 247.19 |

**Movement, Approach, & Intersection Results**

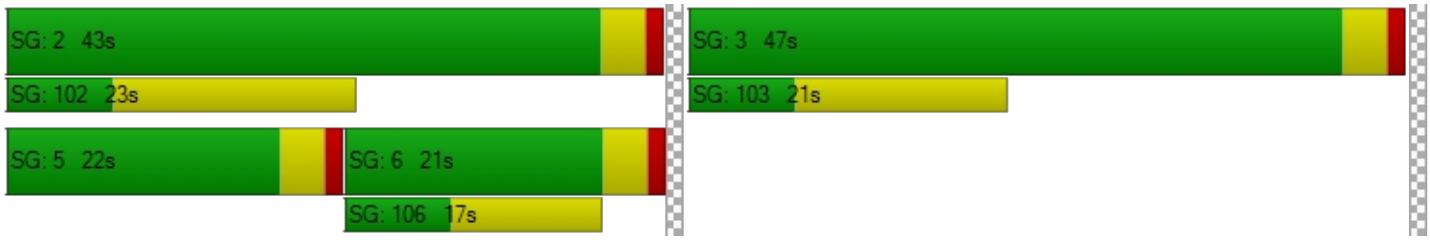
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 33.04 | 0.00 | 30.43 | 0.00 | 0.00 | 0.00 | 40.54 | 8.30 | 0.00 | 0.00 | 17.80 | 18.69 |
| Movement LOS | C | | C | | | | D | A | | | B | B |
| d_A, Approach Delay [s/veh] | 32.29 | | | 0.00 | | | 14.82 | | | 18.25 | | |
| Approach LOS | C | | | A | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 19.89 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.633 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 0.00 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.286 | 2.181 | 0.000 | 3.093 |
| Crosswalk LOS | B | B | F | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 955 | 0 | 866 | 378 |
| d_b, Bicycle Delay [s] | 12.28 | 45.01 | 14.46 | 29.62 |
| l_b,int, Bicycle LOS Score for Intersection | 1.560 | 4.132 | 2.709 | 2.446 |
| Bicycle LOS | A | D | B | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 30.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.501 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 129 | 56 | 162 | 50 | 48 | 106 | 77 | 608 | 93 | 183 | 1034 | 38 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 129 | 56 | 162 | 50 | 48 | 106 | 77 | 608 | 93 | 183 | 1034 | 38 |
| Peak Hour Factor | 0.8740 | 0.8740 | 0.8740 | 0.7860 | 0.7860 | 0.7860 | 0.9250 | 0.9250 | 0.9250 | 0.9540 | 0.9540 | 0.9540 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 37 | 16 | 46 | 16 | 15 | 34 | 21 | 164 | 25 | 48 | 271 | 10 |
| Total Analysis Volume [veh/h] | 148 | 64 | 185 | 64 | 61 | 135 | 83 | 657 | 101 | 192 | 1084 | 40 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 41 | 0 | 0 | 41 | 0 | 11 | 31 | 0 | 18 | 38 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 25 | 0 | 0 | 19 | 0 | 0 | 18 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 12 | 12 | 12 | 12 | 12 | 5 | 55 | 55 | 11 | 61 | 61 |
| g / C, Green / Cycle | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.06 | 0.61 | 0.61 | 0.13 | 0.68 | 0.68 |
| (v / s)_i Volume / Saturation Flow Rate | 0.08 | 0.03 | 0.10 | 0.04 | 0.10 | 0.05 | 0.20 | 0.19 | 0.11 | 0.29 | 0.02 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 104 | 246 | 246 | 227 | 246 | 110 | 1158 | 1158 | 230 | 2569 | 1284 |
| d1, Uniform Delay [s] | 36.21 | 35.32 | 37.81 | 35.38 | 38.05 | 41.62 | 8.64 | 8.54 | 38.36 | 6.62 | 4.83 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 203.63 | 0.55 | 4.58 | 0.67 | 5.79 | 9.86 | 0.78 | 0.73 | 7.72 | 0.51 | 0.05 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 1.43 | 0.26 | 0.75 | 0.28 | 0.80 | 0.75 | 0.33 | 0.32 | 0.83 | 0.42 | 0.03 |
| d, Delay for Lane Group [s/veh] | 239.85 | 35.87 | 42.39 | 36.05 | 43.84 | 51.48 | 9.42 | 9.27 | 46.07 | 7.13 | 4.88 |
| Lane Group LOS | F | D | D | D | D | D | A | A | D | A | A |
| Critical Lane Group | No | No | No | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 7.95 | 1.29 | 4.19 | 1.30 | 4.53 | 2.10 | 3.59 | 3.39 | 4.57 | 4.11 | 0.23 |
| 50th-Percentile Queue Length [ft/ln] | 198.77 | 32.24 | 104.68 | 32.41 | 113.17 | 52.41 | 89.83 | 84.73 | 114.13 | 102.86 | 5.70 |
| 95th-Percentile Queue Length [veh/ln] | 14.14 | 2.32 | 7.54 | 2.33 | 8.02 | 3.77 | 6.47 | 6.10 | 8.07 | 7.41 | 0.41 |
| 95th-Percentile Queue Length [ft/ln] | 353.58 | 58.03 | 188.42 | 58.34 | 200.40 | 94.34 | 161.69 | 152.51 | 201.74 | 185.14 | 10.26 |

**Movement, Approach, & Intersection Results**

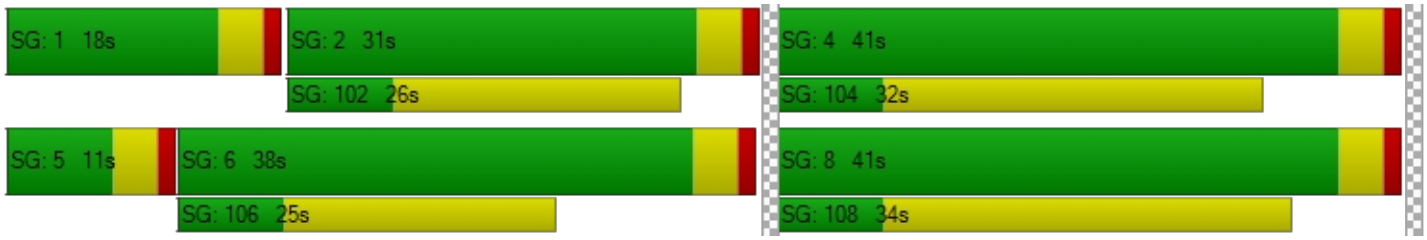
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 239.85 | 35.87 | 42.39 | 36.05 | 43.84 | 43.84 | 51.48 | 9.36 | 9.27 | 46.07 | 7.13 | 4.88 |
| Movement LOS | F | D | D | D | D | D | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 114.95 | | | 41.93 | | | 13.50 | | | 12.74 | | |
| Approach LOS | F | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 30.09 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.501 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.70 | 34.70 | 34.70 | 34.70 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.314 | 2.085 | 2.940 | 2.905 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 822 | 822 | 600 | 755 |
| d_b, Bicycle Delay [s] | 15.63 | 15.63 | 22.07 | 17.44 |
| l_b,int, Bicycle LOS Score for Intersection | 2.215 | 1.989 | 2.253 | 2.645 |
| Bicycle LOS | B | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 30.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.716 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 139 | 353 | 156 | 310 | 324 | 257 | 194 | 741 | 154 | 141 | 949 | 602 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 139 | 353 | 156 | 310 | 324 | 257 | 194 | 741 | 154 | 141 | 949 | 602 |
| Peak Hour Factor | 0.9210 | 0.9210 | 0.9210 | 0.9620 | 0.9620 | 0.9620 | 0.9110 | 0.9110 | 0.9110 | 0.9550 | 0.9550 | 0.9550 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 38 | 96 | 42 | 81 | 84 | 67 | 53 | 203 | 42 | 37 | 248 | 158 |
| Total Analysis Volume [veh/h] | 151 | 383 | 169 | 322 | 337 | 267 | 213 | 813 | 169 | 148 | 994 | 630 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 105 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 10 | 39 | 0 | 17 | 46 | 0 | 12 | 39 | 0 | 10 | 37 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 15 | 15 | 12 | 21 | 21 | 8 | 56 | 56 | 6 | 54 | 54 |
| g / C, Green / Cycle | 0.06 | 0.15 | 0.15 | 0.11 | 0.20 | 0.20 | 0.08 | 0.53 | 0.53 | 0.06 | 0.51 | 0.51 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.10 | 0.09 | 0.09 | 0.17 | 0.15 | 0.06 | 0.21 | 0.09 | 0.04 | 0.26 | 0.33 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 3500 | 1900 | 1900 | 3500 | 3800 | 1900 | 3500 | 3800 | 1900 |
| c, Capacity [veh/h] | 203 | 555 | 278 | 390 | 379 | 379 | 269 | 2022 | 1011 | 203 | 1950 | 975 |
| d1, Uniform Delay [s] | 48.75 | 42.61 | 42.06 | 45.70 | 40.62 | 39.45 | 47.69 | 14.63 | 12.63 | 48.70 | 16.87 | 18.63 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.33 | 1.54 | 2.15 | 4.45 | 5.68 | 2.76 | 5.19 | 0.60 | 0.36 | 4.97 | 0.96 | 3.30 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.74 | 0.69 | 0.61 | 0.83 | 0.86 | 0.73 | 0.79 | 0.40 | 0.17 | 0.73 | 0.51 | 0.65 |
| d, Delay for Lane Group [s/veh] | 54.08 | 44.15 | 44.21 | 50.15 | 46.31 | 42.21 | 52.87 | 15.23 | 12.98 | 53.67 | 17.82 | 21.93 |
| Lane Group LOS | D | D | D | D | D | D | D | B | B | D | B | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | 2.09 | 4.81 | 4.26 | 4.33 | 8.64 | 6.97 | 2.92 | 5.72 | 2.09 | 2.04 | 7.86 | 11.54 |
| 50th-Percentile Queue Length [ft/ln] | 52.32 | 120.33 | 106.38 | 108.24 | 216.10 | 174.37 | 73.07 | 143.02 | 52.30 | 51.06 | 196.48 | 288.44 |
| 95th-Percentile Queue Length [veh/ln] | 3.77 | 8.41 | 7.64 | 7.74 | 13.47 | 11.31 | 5.26 | 9.64 | 3.77 | 3.68 | 12.46 | 17.11 |
| 95th-Percentile Queue Length [ft/ln] | 94.18 | 210.28 | 190.95 | 193.55 | 336.64 | 282.66 | 131.53 | 241.08 | 94.15 | 91.90 | 311.42 | 427.70 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 54.08 | 44.15 | 44.21 | 50.15 | 46.17 | 42.21 | 52.87 | 15.23 | 12.98 | 53.67 | 17.82 | 21.93 |
| Movement LOS | D | D | D | D | D | D | D | B | B | D | B | C |
| d_A, Approach Delay [s/veh] | 46.30 | | | 46.41 | | | 21.62 | | | 22.28 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 30.64 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.716 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 42.11 | 42.11 | 42.11 | 42.11 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.790 | 2.810 | 2.964 | 3.030 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 666 | 800 | 666 | 628 |
| d_b, Bicycle Delay [s] | 23.36 | 18.93 | 23.36 | 24.71 |
| l_b,int, Bicycle LOS Score for Intersection | 2.140 | 2.324 | 2.545 | 3.022 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 25.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.661 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 460 | 32 | 342 | 11 | 19 | 6 | 13 | 855 | 287 | 284 | 1213 | 17 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 460 | 32 | 342 | 11 | 19 | 6 | 13 | 855 | 287 | 284 | 1213 | 17 |
| Peak Hour Factor | 0.9370 | 0.9370 | 0.9370 | 0.8500 | 0.8500 | 0.8500 | 0.9910 | 0.9910 | 0.9910 | 0.9420 | 0.9420 | 0.9420 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 123 | 9 | 91 | 3 | 6 | 2 | 3 | 216 | 72 | 75 | 322 | 5 |
| Total Analysis Volume [veh/h] | 491 | 34 | 365 | 13 | 22 | 7 | 13 | 863 | 290 | 301 | 1288 | 18 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 115 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 6 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 30 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 23 | 60 | 60 | 0 | 37 | 0 | 10 | 38 | 0 | 17 | 45 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 7 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 26 | 0 | 26 | 0 | 0 | 27 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | No | | No | | No | No | | No | No | |
| Maximum Recall | No | No | No | | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | No | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 18 | 27 | 44 | 4 | 4 | 2 | 63 | 63 | 13 | 74 | 74 |
| g / C, Green / Cycle | 0.16 | 0.23 | 0.38 | 0.04 | 0.04 | 0.02 | 0.55 | 0.55 | 0.11 | 0.65 | 0.65 |
| (v / s)_i Volume / Saturation Flow Rate | 0.14 | 0.02 | 0.19 | 0.01 | 0.02 | 0.01 | 0.32 | 0.29 | 0.09 | 0.34 | 0.34 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 |
| c, Capacity [veh/h] | 550 | 439 | 720 | 80 | 74 | 33 | 1048 | 1048 | 396 | 1228 | 1228 |
| d1, Uniform Delay [s] | 47.53 | 34.64 | 27.46 | 53.51 | 53.94 | 55.84 | 16.93 | 16.31 | 49.48 | 10.96 | 10.94 |
| k, delay calibration | 0.11 | 0.11 | 0.26 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.29 | 0.07 | 1.32 | 0.95 | 3.33 | 7.55 | 2.28 | 1.90 | 3.01 | 1.66 | 1.65 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.89 | 0.08 | 0.51 | 0.16 | 0.39 | 0.40 | 0.57 | 0.53 | 0.76 | 0.53 | 0.53 |
| d, Delay for Lane Group [s/veh] | 52.82 | 34.71 | 28.77 | 54.46 | 57.28 | 63.40 | 19.21 | 18.21 | 52.49 | 12.62 | 12.59 |
| Lane Group LOS | D | C | C | D | E | E | B | B | D | B | B |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 7.27 | 0.76 | 7.93 | 0.39 | 0.89 | 0.44 | 10.72 | 9.44 | 4.36 | 8.93 | 8.89 |
| 50th-Percentile Queue Length [ft/ln] | 181.78 | 19.01 | 198.26 | 9.64 | 22.20 | 11.05 | 267.92 | 236.12 | 108.91 | 223.30 | 222.33 |
| 95th-Percentile Queue Length [veh/ln] | 11.69 | 1.37 | 12.55 | 0.69 | 1.60 | 0.80 | 16.09 | 14.49 | 7.78 | 13.83 | 13.78 |
| 95th-Percentile Queue Length [ft/ln] | 292.34 | 34.21 | 313.72 | 17.34 | 39.96 | 19.89 | 402.15 | 362.13 | 194.48 | 345.84 | 344.60 |

**Movement, Approach, & Intersection Results**

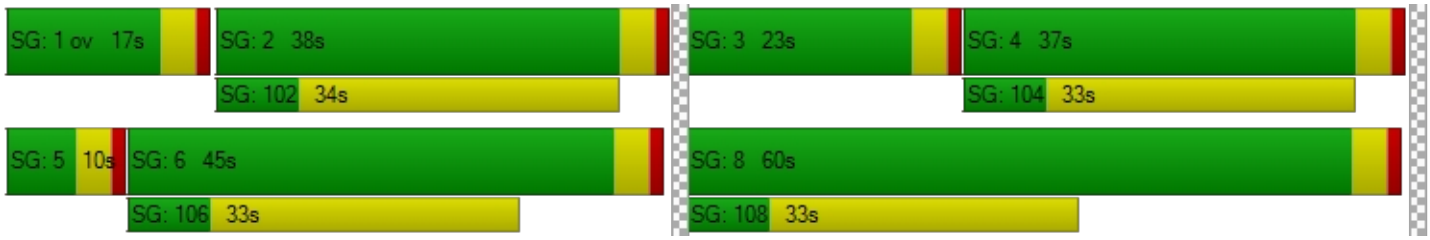
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 52.82 | 34.71 | 28.77 | 54.46 | 57.28 | 57.28 | 63.40 | 18.91 | 18.21 | 52.49 | 12.60 | 12.59 |
| Movement LOS | D | C | C | D | E | E | E | B | B | D | B | B |
| d_A, Approach Delay [s/veh] | 42.26 | | | 56.40 | | | 19.23 | | | 20.07 | | |
| Approach LOS | D | | | E | | | B | | | C | | |
| d_I, Intersection Delay [s/veh] | 25.55 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.661 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 47.04 | 47.04 | 47.04 | 47.04 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.709 | 1.987 | 2.887 | 2.946 |
| Crosswalk LOS | B | A | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 974 | 574 | 591 | 713 |
| d_b, Bicycle Delay [s] | 15.14 | 29.24 | 28.54 | 23.82 |
| l_b,int, Bicycle LOS Score for Intersection | 3.028 | 1.629 | 2.522 | 2.885 |
| Bicycle LOS | C | A | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 19.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.185 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 46 | 308 | 41 | 27 | 245 | 27 | 60 | 4 | 50 | 72 | 4 | 37 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 46 | 308 | 41 | 27 | 245 | 27 | 60 | 4 | 50 | 72 | 4 | 37 |
| Peak Hour Factor | 0.9560 | 0.9560 | 0.9560 | 0.9590 | 0.9590 | 0.9590 | 0.6990 | 0.6990 | 0.6990 | 0.8710 | 0.8710 | 0.8710 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 12 | 81 | 11 | 7 | 64 | 7 | 21 | 1 | 18 | 21 | 1 | 11 |
| Total Analysis Volume [veh/h] | 48 | 322 | 43 | 28 | 255 | 28 | 86 | 6 | 72 | 83 | 5 | 42 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 12 | 26 | 0 | 10 | 24 | 0 | 0 | 54 | 0 | 0 | 54 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 12 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | L | C | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 4 | 69 | 69 | 3 | 67 | 67 | 6 | 6 | 6 | 6 |
| g / C, Green / Cycle | 0.05 | 0.76 | 0.76 | 0.03 | 0.75 | 0.75 | 0.07 | 0.07 | 0.07 | 0.07 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.10 | 0.09 | 0.02 | 0.08 | 0.07 | 0.05 | 0.04 | 0.05 | 0.02 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 86 | 1444 | 1444 | 63 | 1419 | 1419 | 134 | 137 | 105 | 137 |
| d1, Uniform Delay [s] | 41.94 | 2.87 | 2.87 | 42.61 | 3.12 | 3.11 | 40.72 | 40.43 | 40.65 | 39.76 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.56 | 0.18 | 0.18 | 4.92 | 0.14 | 0.14 | 5.08 | 3.70 | 12.31 | 1.48 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.56 | 0.13 | 0.12 | 0.45 | 0.10 | 0.10 | 0.64 | 0.57 | 0.79 | 0.34 |
| d, Delay for Lane Group [s/veh] | 47.50 | 3.06 | 3.04 | 47.53 | 3.26 | 3.25 | 45.80 | 44.14 | 52.96 | 41.24 |
| Lane Group LOS | D | A | A | D | A | A | D | D | D | D |
| Critical Lane Group | No | Yes | No | Yes | No | No | Yes | No | No | No |
| 50th-Percentile Queue Length [veh/ln] | 1.17 | 0.71 | 0.69 | 0.69 | 0.58 | 0.57 | 2.03 | 1.79 | 2.13 | 1.04 |
| 50th-Percentile Queue Length [ft/ln] | 29.14 | 17.69 | 17.15 | 17.26 | 14.60 | 14.30 | 50.63 | 44.86 | 53.21 | 25.90 |
| 95th-Percentile Queue Length [veh/ln] | 2.10 | 1.27 | 1.23 | 1.24 | 1.05 | 1.03 | 3.65 | 3.23 | 3.83 | 1.87 |
| 95th-Percentile Queue Length [ft/ln] | 52.45 | 31.84 | 30.87 | 31.07 | 26.27 | 25.75 | 91.13 | 80.76 | 95.79 | 46.63 |

**Movement, Approach, & Intersection Results**

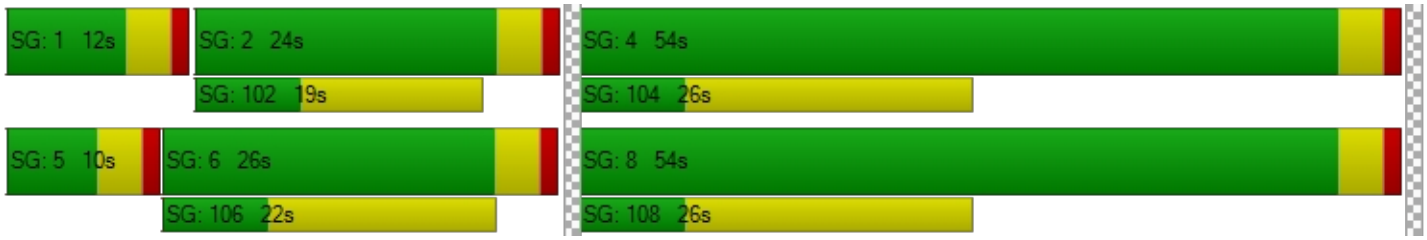
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 47.50 | 3.05 | 3.04 | 47.53 | 3.26 | 3.25 | 45.80 | 44.14 | 44.14 | 52.96 | 41.24 | 41.24 |
| Movement LOS | D | A | A | D | A | A | D | D | D | D | D | D |
| d_A, Approach Delay [s/veh] | 8.22 | | | 7.24 | | | 45.01 | | | 48.72 | | |
| Approach LOS | A | | | A | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 19.02 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.185 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.578 | 2.570 | 2.019 | 2.007 |
| Crosswalk LOS | B | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 489 | 444 | 1111 | 1111 |
| d_b, Bicycle Delay [s] | 25.70 | 27.23 | 8.90 | 8.90 |
| l_b,int, Bicycle LOS Score for Intersection | 1.900 | 1.816 | 1.830 | 1.774 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 18.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.333 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 16 | 314 | 310 | 36 | 345 | 19 | 17 | 3 | 12 | 263 | 3 | 45 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 16 | 314 | 310 | 36 | 345 | 19 | 17 | 3 | 12 | 263 | 3 | 45 |
| Peak Hour Factor | 0.9560 | 0.9560 | 0.9560 | 0.9310 | 0.9310 | 0.9310 | 0.9380 | 0.9380 | 0.9380 | 0.8620 | 0.8620 | 0.8620 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 82 | 81 | 10 | 93 | 5 | 5 | 1 | 3 | 76 | 1 | 13 |
| Total Analysis Volume [veh/h] | 17 | 328 | 324 | 39 | 371 | 20 | 18 | 3 | 13 | 305 | 3 | 52 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 29 | 0 | 10 | 29 | 0 | 0 | 30 | 0 | 0 | 31 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 17 | 0 | 0 | 18 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | C | R | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 0.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 72 | 64 | 64 | 72 | 65 | 65 | 4 | 4 | 13 | 13 |
| g / C, Green / Cycle | 0.72 | 0.64 | 0.64 | 0.72 | 0.65 | 0.65 | 0.04 | 0.04 | 0.13 | 0.13 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.17 | 0.17 | 0.02 | 0.10 | 0.10 | 0.01 | 0.01 | 0.10 | 0.09 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 1315 | 1208 | 1208 | 1249 | 1240 | 1240 | 67 | 71 | 228 | 241 |
| d1, Uniform Delay [s] | 4.07 | 8.02 | 8.00 | 4.13 | 6.73 | 6.72 | 46.92 | 46.69 | 42.46 | 42.07 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.00 | 0.55 | 0.55 | 0.05 | 0.27 | 0.27 | 2.62 | 1.23 | 6.40 | 4.32 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.01 | 0.27 | 0.27 | 0.03 | 0.16 | 0.16 | 0.31 | 0.18 | 0.80 | 0.74 |
|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 4.08 | 8.58 | 8.55 | 4.17 | 7.00 | 6.99 | 49.54 | 47.92 | 48.86 | 46.39 |
| Lane Group LOS | A | A | A | A | A | A | D | D | D | D |
| Critical Lane Group | No | Yes | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.09 | 3.05 | 3.00 | 0.22 | 1.57 | 1.55 | 0.56 | 0.34 | 4.76 | 4.47 |
| 50th-Percentile Queue Length [ft/ln] | 2.18 | 76.18 | 75.05 | 5.38 | 39.34 | 38.80 | 13.90 | 8.42 | 118.97 | 111.67 |
| 95th-Percentile Queue Length [veh/ln] | 0.16 | 5.49 | 5.40 | 0.39 | 2.83 | 2.79 | 1.00 | 0.61 | 8.34 | 7.93 |
| 95th-Percentile Queue Length [ft/ln] | 3.92 | 137.13 | 135.09 | 9.68 | 70.81 | 69.83 | 25.03 | 15.15 | 208.41 | 198.33 |

**Movement, Approach, & Intersection Results**

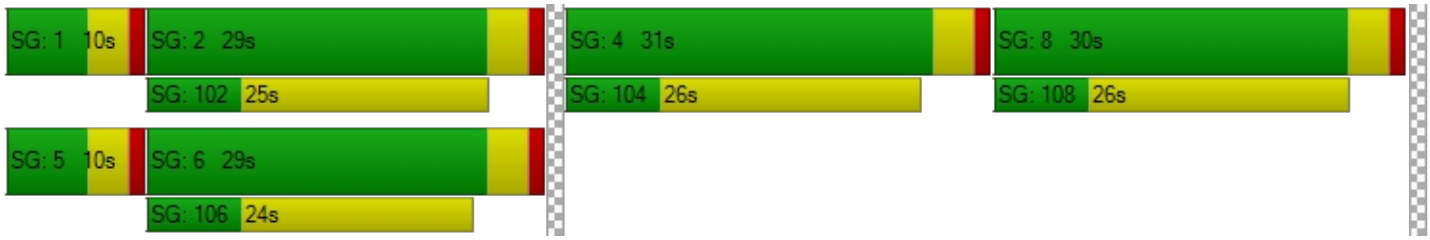
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 4.08 | 8.58 | 8.55 | 4.17 | 6.99 | 6.99 | 49.54 | 49.54 | 47.92 | 47.87 | 46.39 | 46.39 |
| Movement LOS | A | A | A | A | A | A | D | D | D | D | D | D |
| d_A, Approach Delay [s/veh] | 8.45 | | | 6.74 | | | 48.92 | | | 47.65 | | |
| Approach LOS | A | | | A | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 18.33 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.333 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 39.62 | 39.62 | 39.62 | 39.62 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.570 | 2.466 | 1.985 | 2.217 |
| Crosswalk LOS | B | B | A | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 500 | 500 | 520 | 540 |
| d_b, Bicycle Delay [s] | 28.14 | 28.14 | 27.40 | 26.66 |
| l_b,int, Bicycle LOS Score for Intersection | 2.112 | 1.914 | 1.616 | 2.154 |
| Bicycle LOS | B | A | A | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 30.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.600 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 138 | 19 | 64 | 43 | 13 | 368 | 475 | 494 | 22 | 95 | 414 | 26 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 138 | 19 | 64 | 43 | 13 | 368 | 475 | 494 | 22 | 95 | 414 | 26 |
| Peak Hour Factor | 0.8330 | 0.8330 | 0.8330 | 0.9000 | 0.9000 | 0.9000 | 0.8700 | 0.8700 | 0.8700 | 0.9090 | 0.9090 | 0.9090 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 41 | 6 | 19 | 12 | 4 | 102 | 136 | 142 | 6 | 26 | 114 | 7 |
| Total Analysis Volume [veh/h] | 166 | 23 | 77 | 48 | 14 | 409 | 546 | 568 | 25 | 105 | 455 | 29 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 6 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 30 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 37 | 0 | 0 | 10 | 10 | 41 | 31 | 0 | 42 | 32 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 21 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | No | No | No | | No | No | |
| Maximum Recall | | No | | | No | No | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | No | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | C | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 10 | 10 | 10 | 6 | 6 | 49 | 24 | 79 | 79 | 9 | 63 | 63 |
| g / C, Green / Cycle | 0.09 | 0.09 | 0.09 | 0.05 | 0.05 | 0.41 | 0.20 | 0.66 | 0.66 | 0.07 | 0.53 | 0.53 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.07 | 0.04 | 0.03 | 0.01 | 0.22 | 0.16 | 0.16 | 0.15 | 0.06 | 0.13 | 0.13 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 1900 | 1900 |
| c, Capacity [veh/h] | 190 | 209 | 163 | 93 | 98 | 770 | 705 | 1244 | 1244 | 134 | 1003 | 1003 |
| d1, Uniform Delay [s] | 52.17 | 53.80 | 52.31 | 55.51 | 54.44 | 27.07 | 45.40 | 8.50 | 8.47 | 54.61 | 15.35 | 15.31 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.35 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.15 | 2.52 | 2.11 | 4.41 | 0.66 | 1.84 | 1.87 | 0.46 | 0.45 | 9.41 | 0.58 | 0.56 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.36 | 0.58 | 0.47 | 0.52 | 0.14 | 0.53 | 0.78 | 0.24 | 0.24 | 0.78 | 0.24 | 0.24 |
| d, Delay for Lane Group [s/veh] | 53.32 | 56.32 | 54.42 | 59.93 | 55.10 | 28.91 | 47.27 | 8.95 | 8.92 | 64.03 | 15.92 | 15.87 |
| Lane Group LOS | D | E | D | E | E | C | D | A | A | E | B | B |
| Critical Lane Group | No | Yes | No | No | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 2.02 | 3.72 | 2.31 | 1.53 | 0.42 | 9.22 | 7.86 | 3.20 | 3.15 | 3.47 | 3.76 | 3.69 |
| 50th-Percentile Queue Length [ft/ln] | 50.45 | 92.96 | 57.76 | 38.32 | 10.60 | 230.59 | 196.45 | 80.08 | 78.72 | 86.83 | 94.09 | 92.17 |
| 95th-Percentile Queue Length [veh/ln] | 3.63 | 6.69 | 4.16 | 2.76 | 0.76 | 14.20 | 12.46 | 5.77 | 5.67 | 6.25 | 6.77 | 6.64 |
| 95th-Percentile Queue Length [ft/ln] | 90.81 | 167.32 | 103.96 | 68.97 | 19.07 | 355.11 | 311.39 | 144.15 | 141.69 | 156.29 | 169.36 | 165.91 |

**Movement, Approach, & Intersection Results**

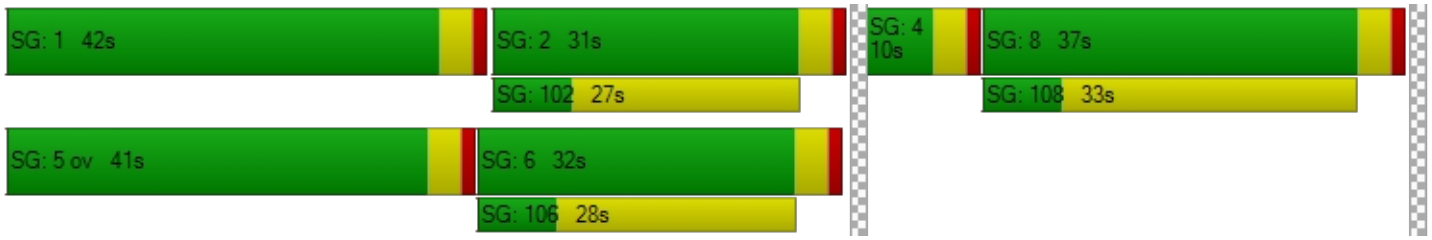
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 55.04 | 56.32 | 54.42 | 59.93 | 55.10 | 28.91 | 47.27 | 8.94 | 8.92 | 64.03 | 15.90 | 15.87 |
| Movement LOS | E | E | D | E | E | C | D | A | A | E | B | B |
| d_A, Approach Delay [s/veh] | 55.00 | | | 32.85 | | | 27.31 | | | 24.48 | | |
| Approach LOS | D | | | C | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 30.68 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.600 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 0.00 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.394 | 2.522 | 0.000 | 2.564 |
| Crosswalk LOS | B | B | F | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 550 | 100 | 450 | 466 |
| d_b, Bicycle Delay [s] | 31.57 | 54.18 | 36.07 | 35.30 |
| l_b,int, Bicycle LOS Score for Intersection | 1.999 | 1.948 | 2.499 | 2.046 |
| Bicycle LOS | A | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 41.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.812 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 426 | 1091 | 211 | 196 | 852 | 306 | 268 | 1189 | 287 | 425 | 1498 | 219 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 426 | 1091 | 211 | 196 | 852 | 306 | 268 | 1189 | 287 | 425 | 1498 | 219 |
| Peak Hour Factor | 0.9550 | 0.9550 | 0.9550 | 0.9460 | 0.9460 | 0.9460 | 0.9460 | 0.9460 | 0.9460 | 0.9450 | 0.9450 | 0.9450 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 112 | 286 | 55 | 52 | 225 | 81 | 71 | 314 | 76 | 112 | 396 | 58 |
| Total Analysis Volume [veh/h] | 446 | 1142 | 221 | 207 | 901 | 323 | 283 | 1257 | 303 | 450 | 1585 | 232 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 19 | 46 | 0 | 12 | 39 | 0 | 15 | 42 | 0 | 20 | 47 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 31 | 0 | 0 | 28 | 0 | 0 | 31 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 15 | 32 | 32 | 8 | 25 | 25 | 11 | 48 | 48 | 16 | 53 | 53 |
| g / C, Green / Cycle | 0.13 | 0.27 | 0.27 | 0.07 | 0.21 | 0.21 | 0.09 | 0.40 | 0.40 | 0.13 | 0.44 | 0.44 |
| (v / s)_i Volume / Saturation Flow Rate | 0.13 | 0.20 | 0.12 | 0.06 | 0.16 | 0.17 | 0.08 | 0.28 | 0.27 | 0.13 | 0.28 | 0.12 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 440 | 1516 | 505 | 238 | 1186 | 395 | 325 | 1515 | 758 | 469 | 2508 | 836 |
| d1, Uniform Delay [s] | 52.50 | 40.47 | 36.62 | 55.45 | 44.73 | 45.37 | 53.78 | 30.07 | 29.57 | 51.68 | 26.09 | 21.45 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.15 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 23.09 | 0.78 | 0.60 | 9.38 | 1.03 | 5.75 | 7.21 | 2.68 | 4.60 | 11.78 | 1.22 | 0.82 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 1.01 | 0.75 | 0.44 | 0.87 | 0.76 | 0.82 | 0.87 | 0.70 | 0.67 | 0.96 | 0.63 | 0.28 |
| d, Delay for Lane Group [s/veh] | 75.59 | 41.25 | 37.22 | 64.82 | 45.76 | 51.12 | 60.99 | 32.74 | 34.17 | 63.46 | 27.31 | 22.28 |
| Lane Group LOS | F | D | D | E | D | D | E | C | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 8.03 | 10.39 | 5.48 | 3.41 | 8.50 | 9.79 | 4.54 | 13.09 | 12.75 | 7.48 | 11.82 | 4.36 |
| 50th-Percentile Queue Length [ft/ln] | 200.85 | 259.66 | 137.07 | 85.36 | 212.62 | 244.66 | 113.54 | 327.23 | 318.63 | 187.07 | 295.45 | 108.91 |
| 95th-Percentile Queue Length [veh/ln] | 12.75 | 15.67 | 9.32 | 6.15 | 13.29 | 14.92 | 8.04 | 19.02 | 18.60 | 11.97 | 17.46 | 7.78 |
| 95th-Percentile Queue Length [ft/ln] | 318.76 | 391.79 | 233.08 | 153.65 | 332.18 | 372.92 | 200.92 | 475.57 | 465.00 | 299.22 | 436.40 | 194.49 |

**Movement, Approach, & Intersection Results**

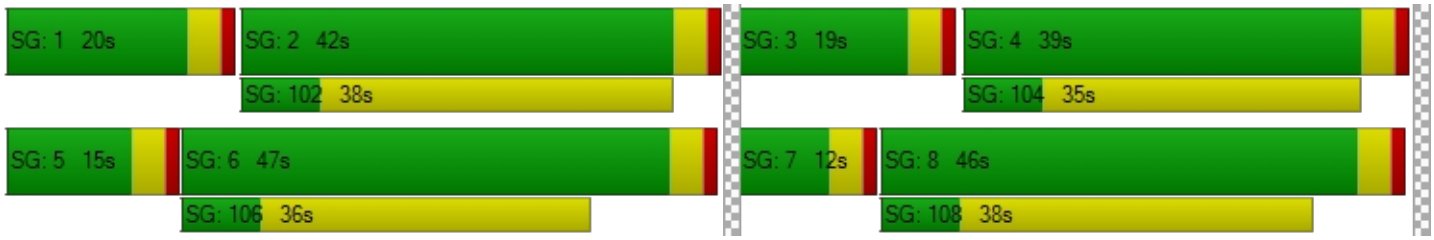
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 75.59 | 41.25 | 37.22 | 64.82 | 45.76 | 51.12 | 60.99 | 32.97 | 34.17 | 63.46 | 27.31 | 22.28 |
| Movement LOS | F | D | D | E | D | D | E | C | C | E | C | C |
| d_A, Approach Delay [s/veh] | 49.22 | | | 49.73 | | | 37.47 | | | 33.97 | | |
| Approach LOS | D | | | D | | | D | | | C | | |
| d_I, Intersection Delay [s/veh] | 41.67 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.812 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.238 | 3.198 | 3.251 | 3.291 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 700 | 583 | 633 | 716 |
| d_b, Bicycle Delay [s] | 25.38 | 30.13 | 28.04 | 24.73 |
| l_b,int, Bicycle LOS Score for Intersection | 2.555 | 2.347 | 2.573 | 2.806 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 18.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.625 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 35 | 47 | 81 | 163 | 104 | 204 | 125 | 1421 | 37 | 103 | 1643 | 253 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 35 | 47 | 81 | 163 | 104 | 204 | 125 | 1421 | 37 | 103 | 1643 | 253 |
| Peak Hour Factor | 0.7970 | 0.7970 | 0.7970 | 0.6700 | 0.6700 | 0.6700 | 0.9700 | 0.9700 | 0.9700 | 0.9160 | 0.9160 | 0.9160 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 11 | 15 | 25 | 61 | 39 | 76 | 32 | 366 | 10 | 28 | 448 | 69 |
| Total Analysis Volume [veh/h] | 44 | 59 | 102 | 243 | 155 | 304 | 129 | 1465 | 38 | 112 | 1794 | 276 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 95 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 47 | 0 | 0 | 47 | 0 | 12 | 34 | 0 | 14 | 36 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 23 | 0 | 0 | 17 | 0 | 0 | 23 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 18 | 18 | 18 | 18 | 18 | 18 | 8 | 57 | 57 | 8 | 57 | 57 |
| g / C, Green / Cycle | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.09 | 0.60 | 0.60 | 0.08 | 0.60 | 0.60 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.03 | 0.05 | 0.14 | 0.04 | 0.16 | 0.07 | 0.26 | 0.27 | 0.06 | 0.31 | 0.15 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 326 | 364 | 364 | 341 | 728 | 364 | 155 | 2289 | 1145 | 144 | 3398 | 1133 |
| d1, Uniform Delay [s] | 31.84 | 32.05 | 32.82 | 35.91 | 32.38 | 36.98 | 42.77 | 10.16 | 10.29 | 42.92 | 11.31 | 9.07 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.19 | 0.21 | 0.42 | 2.78 | 0.14 | 5.06 | 10.99 | 0.60 | 1.27 | 8.83 | 0.59 | 0.51 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.14 | 0.16 | 0.28 | 0.71 | 0.21 | 0.84 | 0.83 | 0.43 | 0.45 | 0.78 | 0.53 | 0.24 |
| d, Delay for Lane Group [s/veh] | 32.02 | 32.26 | 33.24 | 38.69 | 32.52 | 42.04 | 53.77 | 10.76 | 11.57 | 51.75 | 11.90 | 9.58 |
| Lane Group LOS | C | C | C | D | C | D | D | B | B | D | B | A |
| Critical Lane Group | No | No | No | No | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.85 | 1.14 | 2.03 | 5.45 | 1.51 | 7.19 | 3.43 | 5.27 | 5.74 | 2.91 | 6.95 | 2.66 |
| 50th-Percentile Queue Length [ft/ln] | 21.24 | 28.62 | 50.80 | 136.24 | 37.65 | 179.83 | 85.69 | 131.67 | 143.47 | 72.78 | 173.65 | 66.56 |
| 95th-Percentile Queue Length [veh/ln] | 1.53 | 2.06 | 3.66 | 9.28 | 2.71 | 11.59 | 6.17 | 9.03 | 9.67 | 5.24 | 11.27 | 4.79 |
| 95th-Percentile Queue Length [ft/ln] | 38.23 | 51.52 | 91.43 | 231.95 | 67.78 | 289.79 | 154.24 | 225.76 | 241.69 | 131.00 | 281.70 | 119.80 |

**Movement, Approach, & Intersection Results**

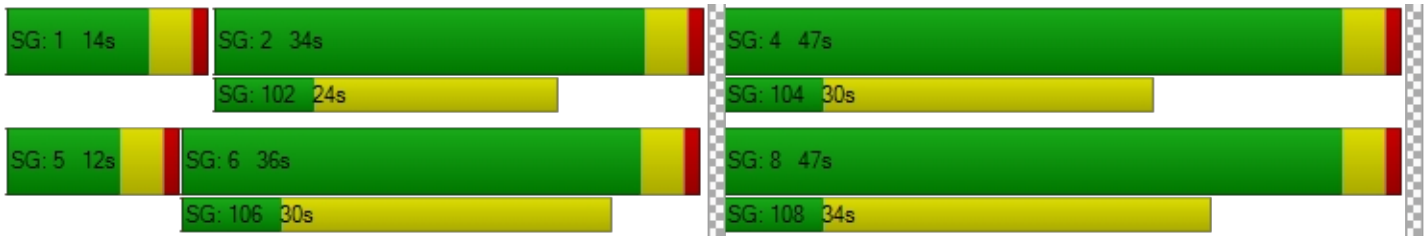
| d_M, Delay for Movement [s/veh] | 32.02 | 32.26 | 33.24 | 38.69 | 32.52 | 42.04 | 53.77 | 11.02 | 11.57 | 51.75 | 11.90 | 9.58 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | C | C | C | D | C | D | D | B | B | D | B | A |
| d_A, Approach Delay [s/veh] | 32.70 | | | 38.78 | | | 14.41 | | | 13.65 | | |
| Approach LOS | C | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 18.48 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.625 | | | | | | | | | | | |

**Other Modes**

| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
|---|---|---|---|---|
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 37.15 | 37.15 | 37.15 | 37.15 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.402 | 2.529 | 3.184 | 3.560 |
| Crosswalk LOS | B | B | C | D |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 905 | 905 | 631 | 673 |
| d_b, Bicycle Delay [s] | 14.24 | 14.24 | 22.25 | 20.90 |
| l_b,int, Bicycle LOS Score for Intersection | 1.898 | 2.139 | 2.457 | 2.760 |
| Bicycle LOS | A | B | B | C |

## Sequence

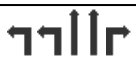
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 37.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.797 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 504 | 802 | 243 | 205 | 629 | 175 | 187 | 1650 | 405 | 224 | 1687 | 138 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 504 | 802 | 243 | 205 | 629 | 175 | 187 | 1650 | 405 | 224 | 1687 | 138 |
| Peak Hour Factor | 0.9630 | 0.9630 | 0.9630 | 0.9380 | 0.9380 | 0.9380 | 0.9710 | 0.9710 | 0.9710 | 0.9670 | 0.9670 | 0.9670 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 131 | 208 | 63 | 55 | 168 | 47 | 48 | 425 | 104 | 58 | 436 | 36 |
| Total Analysis Volume [veh/h] | 523 | 833 | 252 | 219 | 671 | 187 | 193 | 1699 | 417 | 232 | 1745 | 143 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 25 | 50 | 0 | 14 | 39 | 0 | 12 | 43 | 0 | 13 | 44 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 20 | 35 | 35 | 9 | 24 | 24 | 8 | 51 | 51 | 9 | 52 | 52 |
| g / C, Green / Cycle | 0.17 | 0.29 | 0.29 | 0.08 | 0.20 | 0.20 | 0.07 | 0.42 | 0.42 | 0.08 | 0.43 | 0.43 |
| (v / s)_i Volume / Saturation Flow Rate | 0.15 | 0.15 | 0.13 | 0.06 | 0.18 | 0.10 | 0.06 | 0.30 | 0.22 | 0.07 | 0.31 | 0.08 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 581 | 1660 | 553 | 277 | 776 | 388 | 236 | 2399 | 800 | 265 | 2446 | 815 |
| d1, Uniform Delay [s] | 49.09 | 35.32 | 34.77 | 54.32 | 46.17 | 42.16 | 55.27 | 28.69 | 25.80 | 54.93 | 28.19 | 21.16 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.38 | 0.24 | 0.59 | 5.07 | 3.05 | 0.93 | 6.87 | 1.80 | 2.43 | 8.96 | 1.81 | 0.47 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.90 | 0.50 | 0.46 | 0.79 | 0.86 | 0.48 | 0.82 | 0.71 | 0.52 | 0.88 | 0.71 | 0.18 |
| d, Delay for Lane Group [s/veh] | 54.47 | 35.56 | 35.36 | 59.39 | 49.21 | 43.09 | 62.14 | 30.48 | 28.22 | 63.90 | 30.00 | 21.62 |
| Lane Group LOS | D | D | D | E | D | D | E | C | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 8.10 | 6.78 | 6.12 | 3.45 | 9.97 | 5.01 | 3.11 | 13.64 | 9.30 | 3.80 | 13.93 | 2.60 |
| 50th-Percentile Queue Length [ft/ln] | 202.46 | 169.58 | 152.96 | 86.15 | 249.14 | 125.15 | 77.69 | 340.91 | 232.61 | 95.04 | 348.26 | 65.01 |
| 95th-Percentile Queue Length [veh/ln] | 12.77 | 11.05 | 10.17 | 6.20 | 15.14 | 8.68 | 5.59 | 19.69 | 14.31 | 6.84 | 20.05 | 4.68 |
| 95th-Percentile Queue Length [ft/ln] | 319.14 | 276.37 | 254.37 | 155.06 | 378.57 | 216.88 | 139.84 | 492.31 | 357.67 | 171.07 | 501.29 | 117.02 |

**Movement, Approach, & Intersection Results**

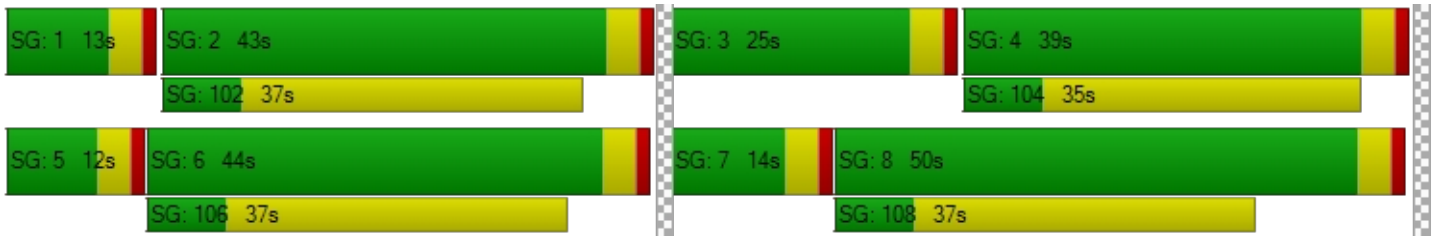
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 54.47 | 35.56 | 35.36 | 59.39 | 49.21 | 43.09 | 62.14 | 30.48 | 28.22 | 63.90 | 30.00 | 21.62 |
| Movement LOS | D | D | D | E | D | D | E | C | C | E | C | C |
| d_A, Approach Delay [s/veh] | 41.68 | | | 50.22 | | | 32.72 | | | 33.15 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 37.52 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.797 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 49.52 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.096 | 3.013 | 3.379 | 3.328 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 766 | 583 | 650 | 666 |
| d_b, Bicycle Delay [s] | 22.83 | 30.12 | 27.35 | 26.68 |
| l_b,int, Bicycle LOS Score for Intersection | 2.444 | 2.448 | 2.830 | 2.726 |
| Bicycle LOS | B | B | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 23.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.694 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 43 | 33 | 59 | 314 | 24 | 208 | 245 | 1593 | 27 | 56 | 1841 | 322 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 43 | 33 | 59 | 314 | 24 | 208 | 245 | 1593 | 27 | 56 | 1841 | 322 |
| Peak Hour Factor | 0.8890 | 0.8890 | 0.8890 | 0.8820 | 0.8820 | 0.8820 | 0.9540 | 0.9540 | 0.9540 | 0.9450 | 0.9450 | 0.9450 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 12 | 9 | 17 | 89 | 7 | 59 | 64 | 417 | 7 | 15 | 487 | 85 |
| Total Analysis Volume [veh/h] | 48 | 37 | 66 | 356 | 27 | 236 | 257 | 1670 | 28 | 59 | 1948 | 341 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 105 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 10 | 0 | 0 | 41 | 0 | 14 | 44 | 0 | 10 | 40 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 28 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 6 | 6 | 18 | 18 | 10 | 60 | 60 | 5 | 56 | 56 |
| g / C, Green / Cycle | 0.06 | 0.06 | 0.06 | 0.17 | 0.17 | 0.09 | 0.57 | 0.57 | 0.05 | 0.53 | 0.53 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.02 | 0.03 | 0.10 | 0.14 | 0.07 | 0.29 | 0.31 | 0.03 | 0.34 | 0.18 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 3500 | 1900 | 3500 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 103 | 103 | 109 | 595 | 323 | 323 | 2176 | 1088 | 86 | 3012 | 1004 |
| d1, Uniform Delay [s] | 47.99 | 47.69 | 48.39 | 40.32 | 42.04 | 46.75 | 13.59 | 13.83 | 49.26 | 17.75 | 14.24 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 3.24 | 2.09 | 5.34 | 0.97 | 5.01 | 4.50 | 0.87 | 1.88 | 9.16 | 1.09 | 0.92 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.47 | 0.36 | 0.61 | 0.60 | 0.81 | 0.80 | 0.51 | 0.53 | 0.68 | 0.65 | 0.34 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 51.23 | 49.78 | 53.73 | 41.29 | 47.05 | 51.25 | 14.45 | 15.72 | 58.42 | 18.84 | 15.16 |
| Lane Group LOS | D | D | D | D | D | D | B | B | E | B | B |
| Critical Lane Group | No | No | Yes | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 1.31 | 0.99 | 1.85 | 4.31 | 6.97 | 3.48 | 7.81 | 8.58 | 1.74 | 11.00 | 4.76 |
| 50th-Percentile Queue Length [ft/ln] | 32.70 | 24.77 | 46.16 | 107.78 | 174.16 | 86.94 | 195.24 | 214.50 | 43.48 | 275.04 | 119.09 |
| 95th-Percentile Queue Length [veh/ln] | 2.35 | 1.78 | 3.32 | 7.72 | 11.30 | 6.26 | 12.39 | 13.38 | 3.13 | 16.44 | 8.34 |
| 95th-Percentile Queue Length [ft/ln] | 58.86 | 44.59 | 83.08 | 192.91 | 282.38 | 156.49 | 309.82 | 334.60 | 78.27 | 411.03 | 208.57 |

**Movement, Approach, & Intersection Results**

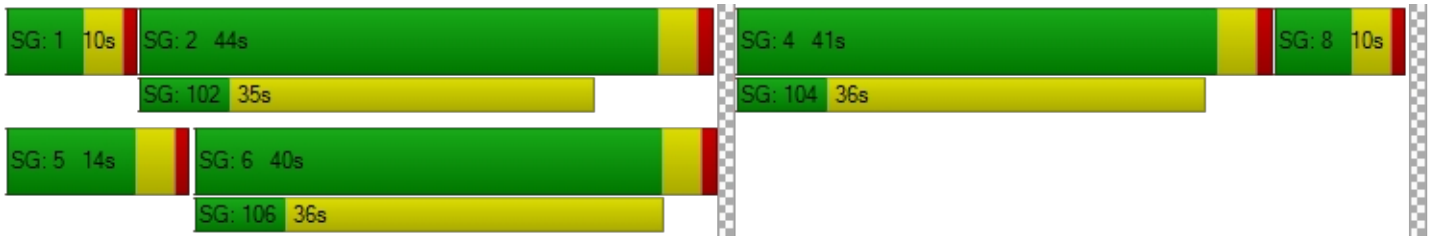
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 51.23 | 49.78 | 53.73 | 41.29 | 47.05 | 47.05 | 51.25 | 14.87 | 15.72 | 58.42 | 18.84 | 15.16 |
| Movement LOS | D | D | D | D | D | D | D | B | B | E | B | B |
| d_A, Approach Delay [s/veh] | 51.97 | | | 43.74 | | | 19.67 | | | 19.30 | | |
| Approach LOS | D | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 23.40 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.694 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 42.11 | 42.11 | 42.11 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.203 | 2.552 | 3.243 | 0.000 |
| Crosswalk LOS | B | B | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 114 | 704 | 761 | 685 |
| d_b, Bicycle Delay [s] | 46.70 | 22.05 | 20.14 | 22.70 |
| l_b,int, Bicycle LOS Score for Intersection | 1.684 | 2.581 | 2.635 | 2.851 |
| Bicycle LOS | A | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 56.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | E |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.960 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 351 | 536 | 344 | 417 | 275 | 93 | 107 | 1759 | 91 | 439 | 1787 | 465 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 351 | 536 | 344 | 417 | 275 | 93 | 107 | 1759 | 91 | 439 | 1787 | 465 |
| Peak Hour Factor | 0.8990 | 0.8990 | 0.8990 | 0.8970 | 0.8970 | 0.8970 | 0.9570 | 0.9570 | 0.9570 | 0.9550 | 0.9550 | 0.9550 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 98 | 149 | 96 | 116 | 77 | 26 | 28 | 460 | 24 | 115 | 468 | 122 |
| Total Analysis Volume [veh/h] | 390 | 596 | 383 | 465 | 307 | 104 | 112 | 1838 | 95 | 460 | 1871 | 487 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 18 | 44 | 0 | 25 | 51 | 0 | 13 | 34 | 0 | 17 | 38 | 38 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 23 | 0 | 0 | 23 | 23 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 14 | 28 | 28 | 21 | 35 | 35 | 6 | 42 | 42 | 13 | 49 | 74 |
| g / C, Green / Cycle | 0.12 | 0.23 | 0.23 | 0.18 | 0.29 | 0.29 | 0.05 | 0.35 | 0.35 | 0.11 | 0.41 | 0.62 |
| (v / s)_i Volume / Saturation Flow Rate | 0.11 | 0.16 | 0.20 | 0.23 | 0.11 | 0.10 | 0.03 | 0.25 | 0.27 | 0.13 | 0.33 | 0.26 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 2000 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 410 | 878 | 439 | 350 | 549 | 549 | 174 | 2004 | 668 | 381 | 2342 | 1177 |
| d1, Uniform Delay [s] | 52.66 | 42.09 | 44.45 | 49.51 | 34.19 | 33.83 | 56.02 | 33.66 | 34.42 | 53.50 | 31.02 | 11.70 |
| k, delay calibration | 0.11 | 0.11 | 0.17 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 11.99 | 0.93 | 8.24 | 151.54 | 0.45 | 0.39 | 3.98 | 2.18 | 7.90 | 99.04 | 2.96 | 1.08 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.95 | 0.68 | 0.87 | 1.33 | 0.39 | 0.36 | 0.65 | 0.71 | 0.76 | 1.21 | 0.80 | 0.41 |
| d, Delay for Lane Group [s/veh] | 64.65 | 43.02 | 52.69 | 201.06 | 34.64 | 34.22 | 60.00 | 35.84 | 42.32 | 152.54 | 33.98 | 12.77 |
| Lane Group LOS | E | D | D | F | C | C | E | D | D | F | C | B |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 6.51 | 8.16 | 11.92 | 12.60 | 5.10 | 4.62 | 1.76 | 12.27 | 14.41 | 10.98 | 16.18 | 6.76 |
| 50th-Percentile Queue Length [ft/ln] | 162.78 | 203.90 | 298.04 | 315.12 | 127.61 | 115.49 | 44.08 | 306.85 | 360.15 | 274.38 | 404.60 | 169.09 |
| 95th-Percentile Queue Length [veh/ln] | 10.70 | 12.84 | 17.58 | 20.73 | 8.81 | 8.14 | 3.17 | 18.02 | 20.63 | 17.62 | 22.78 | 11.03 |
| 95th-Percentile Queue Length [ft/ln] | 267.40 | 320.99 | 439.60 | 518.20 | 220.24 | 203.62 | 79.34 | 450.49 | 515.77 | 440.49 | 569.54 | 275.72 |

**Movement, Approach, & Intersection Results**

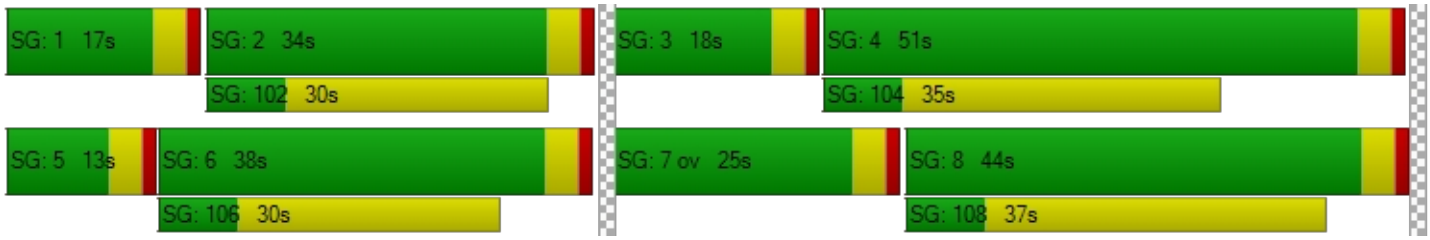
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 64.65 | 43.02 | 52.69 | 201.06 | 34.52 | 34.22 | 60.00 | 37.30 | 42.32 | 152.54 | 33.98 | 12.77 |
| Movement LOS | E | D | D | F | C | C | E | D | D | F | C | B |
| d_A, Approach Delay [s/veh] | 51.89 | | | 122.88 | | | 38.77 | | | 49.67 | | |
| Approach LOS | D | | | F | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 55.98 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |
| Intersection V/C | 0.960 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 49.52 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.918 | 2.803 | 3.341 | 3.517 |
| Crosswalk LOS | C | C | C | D |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 666 | 783 | 500 | 567 |
| d_b, Bicycle Delay [s] | 26.68 | 22.22 | 33.76 | 30.83 |
| l_b,int, Bicycle LOS Score for Intersection | 2.689 | 2.282 | 2.403 | 3.110 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 15.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.691 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 651 | 0 | 522 | 0 | 1637 | 902 | 0 | 2170 | 386 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 651 | 0 | 522 | 0 | 1637 | 902 | 0 | 2170 | 386 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 0.9390 | 1.0000 | 0.9390 | 1.0000 | 0.9540 | 0.9540 | 1.0000 | 0.9730 | 0.9730 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 173 | 0 | 139 | 0 | 429 | 236 | 0 | 558 | 99 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 693 | 0 | 556 | 0 | 1716 | 945 | 0 | 2230 | 397 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_di, Inbound Pedestrian Volume crossing m | | 0 | | | 0 | | | 0 | | | 0 | |
| v_co, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ci, Inbound Pedestrian Volume crossing mi | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ab, Corner Pedestrian Volume [ped/h] | | 0 | | | 0 | | | 0 | | | 0 | |
| Bicycle Volume [bicycles/h] | | 0 | | | 0 | | | 0 | | | 0 | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 8.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 64 | 0 | 0 | 0 | 26 | 0 | 0 | 26 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | | No | |
| Maximum Recall | | | | No | | | | No | | | No | |
| Pedestrian Recall | | | | No | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | C | R | C | C |
|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 26 | 26 | 26 | 56 | 56 |
| g / C, Green / Cycle | | 0.29 | 0.29 | 0.29 | 0.63 | 0.63 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.24 | 0.24 | 0.22 | 0.30 | 0.39 |
| s, saturation flow rate [veh/h] | | 1750 | 1750 | 1900 | 5700 | 5700 |
| c, Capacity [veh/h] | | 499 | 499 | 542 | 3566 | 3566 |
| d1, Uniform Delay [s] | | 30.11 | 30.11 | 29.38 | 9.00 | 10.34 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 3.73 | 3.73 | 2.33 | 0.47 | 0.84 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.83 | 0.83 | 0.77 | 0.48 | 0.63 |
| d, Delay for Lane Group [s/veh] | | 33.84 | 33.84 | 31.71 | 9.47 | 11.17 |
| Lane Group LOS | | C | C | C | A | B |
| Critical Lane Group | | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | | 8.69 | 8.69 | 8.32 | 5.45 | 8.19 |
| 50th-Percentile Queue Length [ft/ln] | | 217.15 | 217.15 | 208.06 | 136.37 | 204.63 |
| 95th-Percentile Queue Length [veh/ln] | | 13.52 | 13.52 | 13.05 | 9.29 | 12.88 |
| 95th-Percentile Queue Length [ft/ln] | | 337.98 | 337.98 | 326.34 | 232.13 | 321.94 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 33.84 | 0.00 | 32.24 | 0.00 | 9.47 | 0.00 | 0.00 | 11.17 | 0.00 |
| Movement LOS | | | | C | | C | | A | | | B | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 33.13 | | | 9.47 | | | 11.17 | | |
| Approach LOS | A | | | C | | | A | | | B | | |
| d_I, Intersection Delay [s/veh] | 15.89 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.691 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 0.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 0.00 | 34.63 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 0.000 | 2.435 | 0.000 | 0.000 |
| Crosswalk LOS | F | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 1335 | 489 | 489 |
| d_b, Bicycle Delay [s] | 44.96 | 4.98 | 25.65 | 25.65 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 3.620 | 2.503 | 2.786 |
| Bicycle LOS | D | D | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 22.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.731 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 886 | 72 | 408 | 0 | 0 | 231 | 206 | 1738 | 360 | 0 | 2267 | 46 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 886 | 72 | 408 | 0 | 0 | 231 | 206 | 1738 | 360 | 0 | 2267 | 46 |
| Peak Hour Factor | 0.9490 | 0.9490 | 0.9490 | 1.0000 | 1.0000 | 0.8840 | 0.9510 | 0.9510 | 0.9510 | 1.0000 | 0.9830 | 0.9830 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 233 | 19 | 107 | 0 | 0 | 65 | 54 | 457 | 95 | 0 | 577 | 12 |
| Total Analysis Volume [veh/h] | 934 | 76 | 430 | 0 | 0 | 261 | 217 | 1828 | 379 | 0 | 2306 | 47 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 95 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 0 | 6 | 6 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 36 | 0 | 0 | 0 | 29 | 29 | 59 | 0 | 0 | 30 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | | No | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | | No | No | No | | | No | |
| Maximum Recall | | No | | | | No | No | No | | | No | |
| Pedestrian Recall | | No | | | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 24 | 24 | 24 | 14 | 14 | 63 | 45 | 45 |
| g / C, Green / Cycle | 0.26 | 0.26 | 0.26 | 0.15 | 0.15 | 0.66 | 0.47 | 0.47 |
| (v / s)_i Volume / Saturation Flow Rate | 0.20 | 0.21 | 0.19 | 0.07 | 0.12 | 0.32 | 0.31 | 0.31 |
| s, saturation flow rate [veh/h] | 3500 | 1750 | 1900 | 3800 | 1800 | 5700 | 5700 | 1900 |
| c, Capacity [veh/h] | 897 | 449 | 487 | 564 | 267 | 3759 | 2674 | 891 |
| d1, Uniform Delay [s] | 32.96 | 33.21 | 32.53 | 37.01 | 39.19 | 8.11 | 19.40 | 19.40 |
| k, delay calibration | 0.11 | 0.17 | 0.14 | 0.11 | 0.11 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.61 | 5.72 | 2.97 | 0.59 | 5.91 | 0.45 | 1.30 | 3.82 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.79 | 0.81 | 0.75 | 0.46 | 0.81 | 0.49 | 0.66 | 0.66 |
| d, Delay for Lane Group [s/veh] | 34.57 | 38.93 | 35.50 | 37.60 | 45.11 | 8.56 | 20.69 | 23.22 |
| Lane Group LOS | C | D | D | D | D | A | C | C |
| Critical Lane Group | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 7.65 | 8.44 | 7.98 | 2.79 | 5.27 | 5.63 | 9.80 | 10.42 |
| 50th-Percentile Queue Length [ft/ln] | 191.27 | 211.09 | 199.38 | 69.82 | 131.87 | 140.73 | 244.90 | 260.55 |
| 95th-Percentile Queue Length [veh/ln] | 12.19 | 13.21 | 12.61 | 5.03 | 9.04 | 9.52 | 14.93 | 15.72 |
| 95th-Percentile Queue Length [ft/ln] | 304.67 | 330.22 | 315.16 | 125.68 | 226.03 | 238.01 | 373.22 | 392.91 |

**Movement, Approach, & Intersection Results**

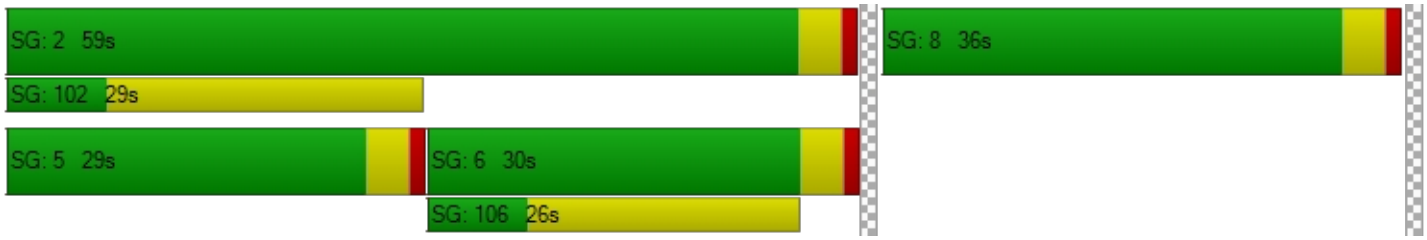
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 35.59 | 38.93 | 36.06 | 0.00 | 0.00 | 37.60 | 45.11 | 8.56 | 0.00 | 0.00 | 21.29 | 23.22 |
| Movement LOS | D | D | D | | | D | D | A | | | C | C |
| d_A, Approach Delay [s/veh] | 35.91 | | | 37.60 | | | 12.44 | | | 21.32 | | |
| Approach LOS | D | | | D | | | B | | | C | | |
| d_I, Intersection Delay [s/veh] | 22.49 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.731 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 37.14 | 37.14 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.583 | 2.138 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 674 | 526 | 1158 | 547 |
| d_b, Bicycle Delay [s] | 20.90 | 25.80 | 8.43 | 25.06 |
| l_b,int, Bicycle LOS Score for Intersection | 3.936 | 1.560 | 2.684 | 2.530 |
| Bicycle LOS | D | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 40.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.850 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 211 | 252 | 82 | 284 | 339 | 218 | 247 | 1745 | 137 | 170 | 1641 | 166 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 211 | 252 | 82 | 284 | 339 | 218 | 247 | 1745 | 137 | 170 | 1641 | 166 |
| Peak Hour Factor | 0.9100 | 0.9100 | 0.9100 | 0.8290 | 0.8290 | 0.8290 | 0.9480 | 0.9480 | 0.9480 | 0.9350 | 0.9350 | 0.9350 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 58 | 69 | 23 | 86 | 102 | 66 | 65 | 460 | 36 | 45 | 439 | 44 |
| Total Analysis Volume [veh/h] | 232 | 277 | 90 | 343 | 409 | 263 | 261 | 1841 | 145 | 182 | 1755 | 178 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 13 | 39 | 0 | 17 | 43 | 0 | 23 | 47 | 0 | 17 | 41 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 29 | 0 | 0 | 26 | 0 | 0 | 25 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 9 | 25 | 25 | 13 | 29 | 29 | 19 | 53 | 53 | 13 | 47 | 47 |
| g / C, Green / Cycle | 0.08 | 0.20 | 0.20 | 0.11 | 0.24 | 0.24 | 0.16 | 0.44 | 0.44 | 0.11 | 0.39 | 0.39 |
| (v / s)_i Volume / Saturation Flow Rate | 0.07 | 0.10 | 0.09 | 0.10 | 0.22 | 0.14 | 0.15 | 0.35 | 0.35 | 0.10 | 0.25 | 0.26 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 267 | 389 | 389 | 383 | 452 | 452 | 286 | 1684 | 842 | 197 | 2244 | 748 |
| d1, Uniform Delay [s] | 54.89 | 42.19 | 41.85 | 52.82 | 44.44 | 40.47 | 49.70 | 28.47 | 28.81 | 53.01 | 29.53 | 29.89 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.21 | 0.11 | 0.14 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 8.44 | 0.95 | 0.83 | 7.57 | 12.51 | 1.19 | 13.87 | 3.66 | 7.78 | 16.38 | 1.42 | 4.61 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.87 | 0.49 | 0.45 | 0.90 | 0.90 | 0.58 | 0.91 | 0.78 | 0.80 | 0.92 | 0.64 | 0.66 |
| d, Delay for Lane Group [s/veh] | 63.33 | 43.14 | 42.68 | 60.39 | 56.94 | 41.66 | 63.57 | 32.13 | 36.60 | 69.39 | 30.95 | 34.50 |
| Lane Group LOS | E | D | D | E | E | D | E | C | D | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 3.78 | 5.10 | 4.69 | 5.50 | 13.31 | 7.03 | 8.79 | 16.58 | 18.09 | 6.33 | 11.38 | 12.59 |
| 50th-Percentile Queue Length [ft/ln] | 94.62 | 127.50 | 117.36 | 137.62 | 332.80 | 175.64 | 219.69 | 414.39 | 452.37 | 158.23 | 284.49 | 314.66 |
| 95th-Percentile Queue Length [veh/ln] | 6.81 | 8.80 | 8.25 | 9.35 | 19.30 | 11.37 | 13.65 | 23.25 | 25.07 | 10.46 | 16.91 | 18.40 |
| 95th-Percentile Queue Length [ft/ln] | 170.31 | 220.08 | 206.20 | 233.81 | 482.39 | 284.31 | 341.23 | 581.32 | 626.78 | 261.38 | 422.80 | 460.11 |

**Movement, Approach, & Intersection Results**

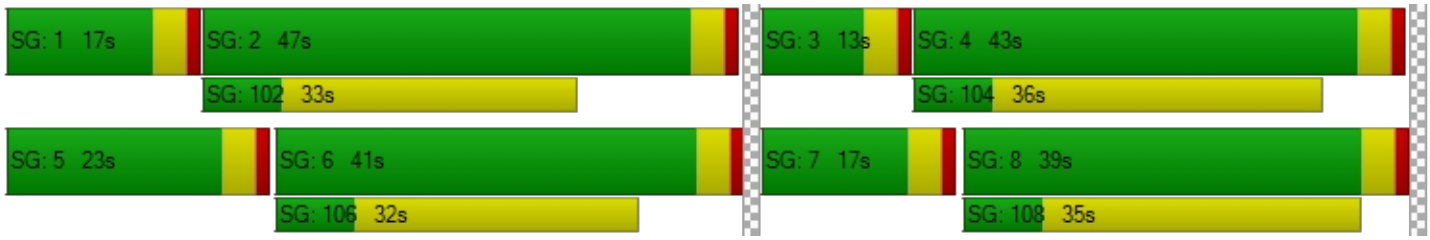
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 63.33 | 42.99 | 42.68 | 60.39 | 56.94 | 41.66 | 63.57 | 33.41 | 36.60 | 69.39 | 31.59 | 34.50 |
| Movement LOS | E | D | D | E | E | D | E | C | D | E | C | C |
| d_A, Approach Delay [s/veh] | 50.82 | | | 54.15 | | | 37.12 | | | 35.09 | | |
| Approach LOS | D | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 40.67 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.850 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.574 | 2.748 | 3.287 | 3.274 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 583 | 650 | 716 | 616 |
| d_b, Bicycle Delay [s] | 30.13 | 27.37 | 24.73 | 28.73 |
| l_b,int, Bicycle LOS Score for Intersection | 2.054 | 3.234 | 2.795 | 2.432 |
| Bicycle LOS | B | C | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 24.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.782 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 235 | 46 | 258 | 24 | 22 | 14 | 18 | 1755 | 274 | 224 | 1806 | 55 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 235 | 46 | 258 | 24 | 22 | 14 | 18 | 1755 | 274 | 224 | 1806 | 55 |
| Peak Hour Factor | 0.8580 | 0.8580 | 0.8580 | 0.6480 | 0.6480 | 0.6480 | 0.9520 | 0.9520 | 0.9520 | 0.9460 | 0.9460 | 0.9460 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 68 | 13 | 75 | 9 | 8 | 5 | 5 | 461 | 72 | 59 | 477 | 15 |
| Total Analysis Volume [veh/h] | 274 | 54 | 301 | 37 | 34 | 22 | 19 | 1843 | 288 | 237 | 1909 | 58 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 26 | 0 | 0 | 10 | 0 | 10 | 32 | 0 | 22 | 44 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 14 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 17 | 17 | 17 | 5 | 5 | 2 | 38 | 38 | 14 | 49 | 49 |
| g / C, Green / Cycle | 0.19 | 0.19 | 0.19 | 0.06 | 0.06 | 0.03 | 0.42 | 0.42 | 0.15 | 0.55 | 0.55 |
| (v / s)_i Volume / Saturation Flow Rate | 0.09 | 0.09 | 0.16 | 0.02 | 0.03 | 0.01 | 0.32 | 0.15 | 0.13 | 0.34 | 0.35 |
| s, saturation flow rate [veh/h] | 1750 | 1750 | 1900 | 1800 | 1900 | 1800 | 5700 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 327 | 327 | 355 | 110 | 116 | 48 | 2396 | 799 | 277 | 2081 | 1041 |
| d1, Uniform Delay [s] | 32.86 | 32.91 | 35.42 | 40.57 | 40.94 | 43.18 | 22.40 | 17.86 | 37.16 | 13.99 | 14.28 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.17 | 1.21 | 5.61 | 1.77 | 3.05 | 5.23 | 2.45 | 1.27 | 7.41 | 1.41 | 3.10 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.50 | 0.50 | 0.85 | 0.34 | 0.48 | 0.40 | 0.77 | 0.36 | 0.85 | 0.62 | 0.65 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 34.03 | 34.12 | 41.03 | 42.33 | 43.99 | 48.40 | 24.84 | 19.13 | 44.57 | 15.40 | 17.38 |
| Lane Group LOS | C | C | D | D | D | D | C | B | D | B | B |
| Critical Lane Group | No | No | Yes | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 3.24 | 3.29 | 6.80 | 0.83 | 1.29 | 0.48 | 11.08 | 4.22 | 5.57 | 8.67 | 9.65 |
| 50th-Percentile Queue Length [ft/ln] | 81.01 | 82.34 | 169.94 | 20.83 | 32.22 | 12.06 | 276.97 | 105.50 | 139.15 | 216.72 | 241.28 |
| 95th-Percentile Queue Length [veh/ln] | 5.83 | 5.93 | 11.07 | 1.50 | 2.32 | 0.87 | 16.54 | 7.59 | 9.43 | 13.50 | 14.75 |
| 95th-Percentile Queue Length [ft/ln] | 145.81 | 148.21 | 276.83 | 37.49 | 57.99 | 21.70 | 413.43 | 189.73 | 235.87 | 337.43 | 368.65 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 34.07 | 34.12 | 41.03 | 42.33 | 43.99 | 43.99 | 48.40 | 24.84 | 19.13 | 44.57 | 16.04 | 17.38 |
| Movement LOS | C | C | D | D | D | D | D | C | B | D | B | B |
| d_A, Approach Delay [s/veh] | 37.40 | | | 43.33 | | | 24.29 | | | 19.14 | | |
| Approach LOS | D | | | D | | | C | | | B | | |
| d_I, Intersection Delay [s/veh] | 24.03 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.782 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.72 | 34.72 | 0.00 | 34.72 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.420 | 2.013 | 0.000 | 3.204 |
| Crosswalk LOS | B | B | F | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 488 | 133 | 622 | 888 |
| d_b, Bicycle Delay [s] | 25.73 | 39.24 | 21.40 | 13.92 |
| l_b,int, Bicycle LOS Score for Intersection | 2.597 | 1.713 | 2.742 | 2.772 |
| Bicycle LOS | B | A | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |



Brea Mall Expansion, Brea

Vistro File: N:\...\4099 HCM Network.vistro
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Scenario 3 Sat MD Existing
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | HCM 6th Edition | WB Left | 0.772 | 35.7 | D |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | HCM 6th Edition | WB Left | 0.773 | 25.1 | C |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | HCM 6th Edition | EB Left | 0.726 | 24.9 | C |
| 4 | Randolph Avenue at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.445 | 20.0 | C |
| 5 | State College Boulevard at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.691 | 37.3 | D |
| 6 | S Associated Road at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.548 | 22.3 | C |
| 7 | Randolph Avenue at Madison Way | Signalized | HCM 6th Edition | WB Left | 0.246 | 20.5 | C |
| 8 | Randolph Avenue at Brea Mall | Signalized | HCM 6th Edition | EB Left | 0.469 | 22.7 | C |
| 9 | Brea Mall South at State College Boulevard | Signalized | HCM 6th Edition | WB Left | 0.785 | 32.8 | C |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.705 | 38.7 | D |
| 11 | Puente Street at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.436 | 13.0 | B |
| 12 | Brea Boulevard at Imperial Highway | Signalized | HCM 6th Edition | EB Left | 0.845 | 40.3 | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.810 | 36.2 | D |
| 14 | State College Boulevard at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 1.241 | 111.9 | F |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.771 | 17.5 | B |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | HCM 6th Edition | EB Left | 0.871 | 36.5 | D |
| 17 | Associated Road at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.767 | 34.5 | C |
| 18 | Castlegate Lane/Placentia | Signalized | HCM 6th | EB Left | 0.750 | 20.8 | C |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | Edition | EB Left | 0.750 | 20.8 | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 35.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.772 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 128 | 247 | 318 | 496 | 351 | 5 | 18 | 970 | 259 | 650 | 1334 | 689 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 128 | 247 | 318 | 496 | 351 | 5 | 18 | 970 | 259 | 650 | 1334 | 689 |
| Peak Hour Factor | 0.9010 | 0.9010 | 0.9010 | 0.8760 | 0.8760 | 0.8760 | 0.8390 | 0.8390 | 0.8390 | 0.9650 | 0.9650 | 0.9650 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 36 | 69 | 88 | 142 | 100 | 1 | 5 | 289 | 77 | 168 | 346 | 178 |
| Total Analysis Volume [veh/h] | 142 | 274 | 353 | 566 | 401 | 6 | 21 | 1156 | 309 | 674 | 1382 | 714 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 10 | 29 | 0 | 25 | 44 | 0 | 10 | 39 | 0 | 27 | 56 | 56 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 28 | 0 | 0 | 22 | 22 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 6 | 17 | 17 | 17 | 21 | 32 | 32 | 3 | 43 | 43 | 23 | 63 | 88 |
| g / C, Green / Cycle | 0.05 | 0.14 | 0.14 | 0.14 | 0.18 | 0.27 | 0.27 | 0.03 | 0.36 | 0.36 | 0.19 | 0.52 | 0.73 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.12 | 0.11 | 0.10 | 0.16 | 0.11 | 0.11 | 0.01 | 0.19 | 0.19 | 0.19 | 0.24 | 0.38 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1900 | 3500 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 178 | 274 | 274 | 274 | 613 | 511 | 511 | 91 | 2026 | 675 | 671 | 2970 | 1386 |
| d1, Uniform Delay [s] | 56.38 | 49.97 | 49.19 | 49.01 | 48.72 | 35.96 | 35.94 | 57.28 | 30.97 | 30.69 | 48.52 | 18.17 | 7.03 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 8.01 | 6.58 | 3.87 | 3.45 | 6.42 | 0.51 | 0.50 | 1.27 | 1.07 | 2.93 | 17.12 | 0.53 | 1.37 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.80 | 0.83 | 0.74 | 0.71 | 0.92 | 0.40 | 0.40 | 0.23 | 0.55 | 0.53 | 1.00 | 0.47 | 0.52 |
| d, Delay for Lane Group [s/veh] | 64.39 | 56.55 | 53.06 | 52.46 | 55.13 | 36.47 | 36.44 | 58.55 | 32.04 | 33.61 | 65.63 | 18.70 | 8.40 |
| Lane Group LOS | E | E | D | D | E | D | D | E | C | C | F | B | A |
| Critical Lane Group | No | Yes | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.33 | 7.18 | 6.10 | 5.86 | 8.86 | 4.98 | 4.96 | 0.33 | 8.74 | 8.69 | 11.59 | 8.09 | 7.52 |
| 50th-Percentile Queue Length [ft/ln] | 58.18 | 179.3 | 152.5 | 146.5 | 221.45 | 124.61 | 123.88 | 8.22 | 218.48 | 217.23 | 289.75 | 202.17 | 187.94 |
| 95th-Percentile Queue Length [veh/ln] | 4.19 | 11.57 | 10.15 | 9.83 | 13.74 | 8.65 | 8.61 | 0.59 | 13.59 | 13.52 | 17.21 | 12.75 | 12.01 |
| 95th-Percentile Queue Length [ft/ln] | 104.7 | 289.2 | 253.8 | 245.8 | 343.47 | 216.14 | 215.15 | 14.79 | 339.68 | 338.09 | 430.24 | 318.76 | 300.36 |

**Movement, Approach, & Intersection Results**

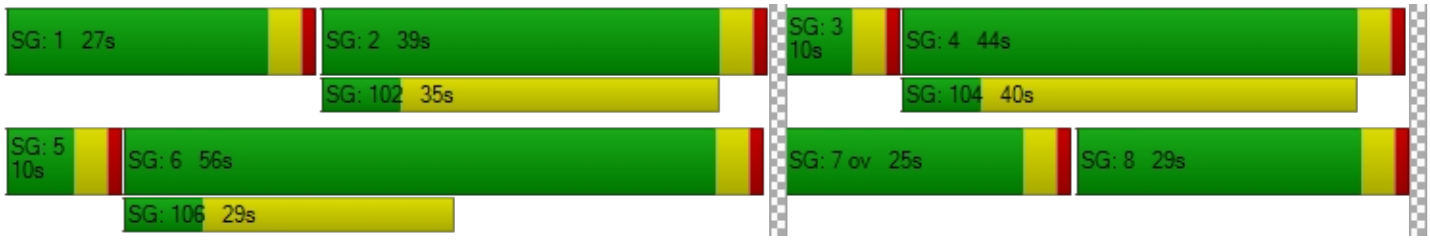
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 64.39 | 55.98 | 52.71 | 55.13 | 36.45 | 36.44 | 58.55 | 32.10 | 33.61 | 65.63 | 18.70 | 8.40 |
| Movement LOS | E | E | D | E | D | D | E | C | C | F | B | A |
| d_A, Approach Delay [s/veh] | 56.04 | | | 47.32 | | | 32.79 | | | 27.46 | | |
| Approach LOS | E | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 35.67 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.772 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.908 | 2.789 | 3.190 | 0.000 |
| Crosswalk LOS | C | C | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 417 | 666 | 583 | 866 |
| d_b, Bicycle Delay [s] | 37.62 | 26.68 | 30.12 | 19.28 |
| l_b,int, Bicycle LOS Score for Intersection | 2.194 | 2.362 | 2.173 | 3.083 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 25.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.773 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 794 | 0 | 1020 | 0 | 1250 | 520 | 165 | 1654 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 794 | 0 | 1020 | 0 | 1250 | 520 | 165 | 1654 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 0.9460 | 1.0000 | 0.9460 | 1.0000 | 0.9230 | 0.9230 | 0.9510 | 0.9510 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 210 | 0 | 270 | 0 | 339 | 141 | 43 | 435 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 839 | 0 | 1078 | 0 | 1354 | 563 | 174 | 1739 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 57 | 0 | 0 | 0 | 23 | 0 | 10 | 33 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 14 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | No | No | |
| Maximum Recall | | | | No | | | | No | | No | No | |
| Pedestrian Recall | | | | No | | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | C | R | C | C | R | L | C |
|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 38 | 38 | 38 | 34 | 34 | 34 | 6 | 44 |
| g / C, Green / Cycle | | 0.43 | 0.43 | 0.43 | 0.37 | 0.37 | 0.37 | 0.07 | 0.48 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.37 | 0.37 | 0.34 | 0.25 | 0.25 | 0.25 | 0.05 | 0.31 |
| s, saturation flow rate [veh/h] | | 1750 | 1750 | 1900 | 3800 | 1900 | 1900 | 3500 | 5700 |
| c, Capacity [veh/h] | | 746 | 746 | 810 | 1416 | 708 | 708 | 237 | 2764 |
| d1, Uniform Delay [s] | | 23.34 | 23.34 | 22.33 | 23.69 | 23.69 | 23.69 | 41.18 | 17.20 |
| k, delay calibration | | 0.18 | 0.18 | 0.15 | 0.50 | 0.50 | 0.50 | 0.11 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 4.94 | 4.94 | 2.39 | 2.61 | 5.14 | 5.14 | 4.38 | 1.10 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.86 | 0.86 | 0.79 | 0.68 | 0.68 | 0.68 | 0.73 | 0.63 |
| d, Delay for Lane Group [s/veh] | | 28.28 | 28.28 | 24.72 | 26.30 | 28.83 | 28.83 | 45.57 | 18.29 |
| Lane Group LOS | | C | C | C | C | C | C | D | B |
| Critical Lane Group | | Yes | No | No | No | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | | 12.56 | 12.56 | 11.58 | 8.71 | 9.21 | 9.21 | 2.02 | 8.62 |
| 50th-Percentile Queue Length [ft/ln] | | 314.09 | 314.09 | 289.42 | 217.73 | 230.15 | 230.15 | 50.39 | 215.47 |
| 95th-Percentile Queue Length [veh/ln] | | 18.38 | 18.38 | 17.16 | 13.55 | 14.18 | 14.18 | 3.63 | 13.43 |
| 95th-Percentile Queue Length [ft/ln] | | 459.41 | 459.41 | 428.92 | 338.72 | 354.55 | 354.55 | 90.71 | 335.84 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 28.28 | 0.00 | 26.17 | 0.00 | 26.45 | 28.83 | 45.57 | 18.29 | 0.00 |
| Movement LOS | | | | C | | C | | C | C | D | B | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 27.09 | | | 27.57 | | | 20.77 | | |
| Approach LOS | A | | | C | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 25.15 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.773 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.074 | 2.563 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 1177 | 422 | 644 |
| d_b, Bicycle Delay [s] | 45.01 | 7.61 | 28.02 | 20.68 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 4.723 | 2.614 | 2.612 |
| Bicycle LOS | D | E | B | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 24.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.726 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | | | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1031 | 0 | 421 | 0 | 0 | 0 | 539 | 1510 | 0 | 0 | 788 | 399 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1031 | 0 | 421 | 0 | 0 | 0 | 539 | 1510 | 0 | 0 | 788 | 399 |
| Peak Hour Factor | 0.9860 | 1.0000 | 0.9860 | 1.0000 | 1.0000 | 1.0000 | 0.9080 | 0.9080 | 1.0000 | 1.0000 | 0.9400 | 0.9400 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 261 | 0 | 107 | 0 | 0 | 0 | 148 | 416 | 0 | 0 | 210 | 106 |
| Total Analysis Volume [veh/h] | 1046 | 0 | 427 | 0 | 0 | 0 | 594 | 1663 | 0 | 0 | 838 | 424 |
| Presence of On-Street Parking | No | | No | | | | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 95 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 6 | 0 | 0 | 0 | 0 | 0 | 6 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 0 | 0 | 0 | 0 | 0 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 46 | 0 | 0 | 0 | 0 | 0 | 28 | 49 | 0 | 0 | 21 | 0 |
| Vehicle Extension [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 10 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | No | | | | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | | | | | | No | No | | | No | |
| Maximum Recall | No | | | | | | No | No | | | No | |
| Pedestrian Recall | No | | | | | | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | R | | L | C | C | C | R |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 95 | 95 | | 95 | 95 | 95 | 95 | 95 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 33 | 33 | | 19 | 54 | 31 | 31 | 31 |
| g / C, Green / Cycle | 0.35 | 0.35 | | 0.20 | 0.57 | 0.33 | 0.33 | 0.33 |
| (v / s)_i Volume / Saturation Flow Rate | 0.30 | 0.22 | | 0.17 | 0.29 | 0.17 | 0.17 | 0.17 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | | 3500 | 5700 | 3800 | 1900 | 1900 |
| c, Capacity [veh/h] | 1212 | 658 | | 690 | 3246 | 1255 | 628 | 628 |
| d1, Uniform Delay [s] | 28.96 | 26.19 | | 36.88 | 12.43 | 25.56 | 25.56 | 25.56 |
| k, delay calibration | 0.11 | 0.11 | | 0.11 | 0.50 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.96 | 1.09 | | 3.31 | 0.58 | 1.44 | 2.86 | 2.86 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.86 | 0.65 | | 0.86 | 0.51 | 0.50 | 0.50 | 0.50 |
| d, Delay for Lane Group [s/veh] | 30.92 | 27.28 | | 40.19 | 13.01 | 27.00 | 28.42 | 28.42 |
| Lane Group LOS | C | C | | D | B | C | C | C |
| Critical Lane Group | Yes | No | | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 11.05 | 8.11 | | 6.87 | 6.81 | 5.85 | 6.09 | 6.09 |
| 50th-Percentile Queue Length [ft/ln] | 276.26 | 202.86 | | 171.64 | 170.19 | 146.13 | 152.33 | 152.33 |
| 95th-Percentile Queue Length [veh/ln] | 16.50 | 12.79 | | 11.16 | 11.09 | 9.81 | 10.14 | 10.14 |
| 95th-Percentile Queue Length [ft/ln] | 412.55 | 319.65 | | 279.07 | 277.16 | 245.26 | 253.54 | 253.54 |

**Movement, Approach, & Intersection Results**

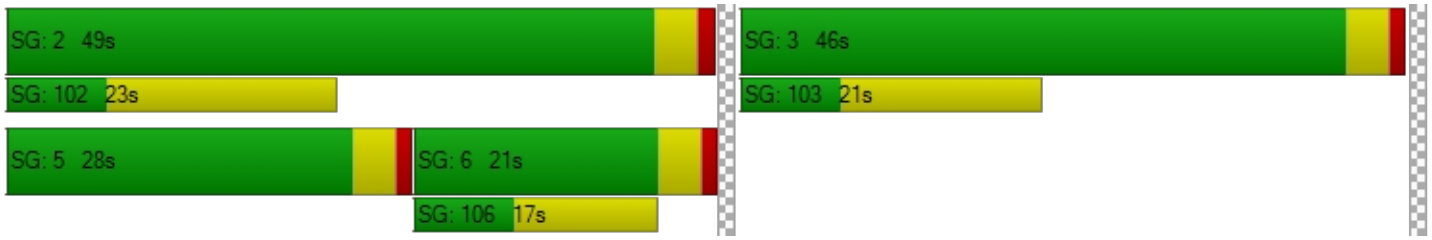
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 30.92 | 0.00 | 27.28 | 0.00 | 0.00 | 0.00 | 40.19 | 13.01 | 0.00 | 0.00 | 27.00 | 28.42 |
| Movement LOS | C | | C | | | | D | B | | | C | C |
| d_A, Approach Delay [s/veh] | 29.87 | | | 0.00 | | | 20.16 | | | 27.71 | | |
| Approach LOS | C | | | A | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 24.93 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.726 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 37.14 | 37.14 | 0.00 | 37.14 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.421 | 2.213 | 0.000 | 3.063 |
| Crosswalk LOS | B | B | F | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 884 | 0 | 947 | 358 |
| d_b, Bicycle Delay [s] | 14.79 | 47.51 | 13.16 | 32.03 |
| l_b,int, Bicycle LOS Score for Intersection | 1.560 | 4.132 | 2.801 | 2.254 |
| Bicycle LOS | A | D | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 20.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.445 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 96 | 74 | 168 | 54 | 37 | 77 | 86 | 564 | 121 | 146 | 710 | 25 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 96 | 74 | 168 | 54 | 37 | 77 | 86 | 564 | 121 | 146 | 710 | 25 |
| Peak Hour Factor | 0.8630 | 0.8630 | 0.8630 | 0.7790 | 0.7790 | 0.7790 | 0.9320 | 0.9320 | 0.9320 | 0.9670 | 0.9670 | 0.9670 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 28 | 21 | 49 | 17 | 12 | 25 | 23 | 151 | 32 | 38 | 184 | 6 |
| Total Analysis Volume [veh/h] | 111 | 86 | 195 | 69 | 47 | 99 | 92 | 605 | 130 | 151 | 734 | 26 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 38 | 0 | 0 | 38 | 0 | 23 | 30 | 0 | 22 | 29 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 25 | 0 | 0 | 19 | 0 | 0 | 18 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 12 | 12 | 12 | 12 | 12 | 6 | 57 | 57 | 9 | 60 | 60 |
| g / C, Green / Cycle | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.07 | 0.63 | 0.63 | 0.10 | 0.67 | 0.67 |
| (v / s)_i Volume / Saturation Flow Rate | 0.06 | 0.05 | 0.10 | 0.04 | 0.08 | 0.05 | 0.20 | 0.19 | 0.08 | 0.19 | 0.01 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 157 | 251 | 251 | 213 | 251 | 123 | 1196 | 1196 | 190 | 2533 | 1266 |
| d1, Uniform Delay [s] | 36.17 | 35.55 | 37.82 | 35.29 | 36.76 | 41.22 | 7.72 | 7.61 | 39.36 | 6.21 | 5.08 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.66 | 0.81 | 5.15 | 0.88 | 2.13 | 8.77 | 0.70 | 0.64 | 7.43 | 0.29 | 0.03 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.70 | 0.34 | 0.78 | 0.32 | 0.58 | 0.75 | 0.32 | 0.30 | 0.80 | 0.29 | 0.02 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 41.82 | 36.35 | 42.97 | 36.17 | 38.90 | 49.99 | 8.42 | 8.25 | 46.79 | 6.50 | 5.11 |
| Lane Group LOS | D | D | D | D | D | D | A | A | D | A | A |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.48 | 1.75 | 4.45 | 1.40 | 3.13 | 2.28 | 3.24 | 3.00 | 3.61 | 2.57 | 0.15 |
| 50th-Percentile Queue Length [ft/ln] | 61.90 | 43.83 | 111.32 | 35.09 | 78.21 | 57.04 | 80.93 | 74.96 | 90.18 | 64.21 | 3.84 |
| 95th-Percentile Queue Length [veh/ln] | 4.46 | 3.16 | 7.91 | 2.53 | 5.63 | 4.11 | 5.83 | 5.40 | 6.49 | 4.62 | 0.28 |
| 95th-Percentile Queue Length [ft/ln] | 111.42 | 78.90 | 197.83 | 63.16 | 140.77 | 102.67 | 145.67 | 134.93 | 162.33 | 115.57 | 6.90 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 41.82 | 36.35 | 42.97 | 36.17 | 38.90 | 38.90 | 49.99 | 8.36 | 8.25 | 46.79 | 6.50 | 5.11 |
| Movement LOS | D | D | D | D | D | D | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 41.19 | | | 38.02 | | | 12.97 | | | 13.14 | | |
| Approach LOS | D | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 20.05 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.445 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.70 | 34.70 | 34.70 | 34.70 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.306 | 2.076 | 2.803 | 2.840 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 755 | 755 | 577 | 555 |
| d_b, Bicycle Delay [s] | 17.44 | 17.44 | 22.78 | 23.49 |
| l_b,int, Bicycle LOS Score for Intersection | 2.206 | 1.914 | 2.242 | 2.311 |
| Bicycle LOS | B | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 37.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.691 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 123 | 263 | 176 | 252 | 549 | 429 | 225 | 691 | 162 | 164 | 656 | 216 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 123 | 263 | 176 | 252 | 549 | 429 | 225 | 691 | 162 | 164 | 656 | 216 |
| Peak Hour Factor | 0.9440 | 0.9440 | 0.9440 | 0.9150 | 0.9150 | 0.9150 | 0.9030 | 0.9030 | 0.9030 | 0.9260 | 0.9260 | 0.9260 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 33 | 70 | 47 | 69 | 150 | 117 | 62 | 191 | 45 | 44 | 177 | 58 |
| Total Analysis Volume [veh/h] | 130 | 279 | 186 | 275 | 600 | 469 | 249 | 765 | 179 | 177 | 708 | 233 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 115 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 10 | 39 | 0 | 26 | 55 | 0 | 13 | 39 | 0 | 11 | 37 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 33 | 33 | 11 | 38 | 38 | 9 | 48 | 48 | 7 | 46 | 46 |
| g / C, Green / Cycle | 0.05 | 0.28 | 0.28 | 0.10 | 0.33 | 0.33 | 0.08 | 0.42 | 0.42 | 0.06 | 0.40 | 0.40 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.07 | 0.10 | 0.08 | 0.30 | 0.26 | 0.07 | 0.20 | 0.09 | 0.05 | 0.19 | 0.12 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 3500 | 1900 | 1900 | 3500 | 3800 | 1900 | 3500 | 3800 | 1900 |
| c, Capacity [veh/h] | 185 | 1074 | 537 | 349 | 626 | 626 | 276 | 1584 | 792 | 216 | 1518 | 759 |
| d1, Uniform Delay [s] | 53.60 | 31.95 | 32.82 | 50.60 | 36.94 | 35.08 | 52.56 | 24.50 | 21.61 | 53.37 | 25.50 | 23.65 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.23 | 0.16 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.76 | 0.13 | 0.38 | 3.95 | 10.54 | 3.58 | 10.43 | 1.06 | 0.66 | 7.56 | 1.03 | 1.05 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.70 | 0.26 | 0.35 | 0.79 | 0.91 | 0.80 | 0.90 | 0.48 | 0.23 | 0.82 | 0.47 | 0.31 |
| d, Delay for Lane Group [s/veh] | 58.36 | 32.08 | 33.20 | 54.55 | 47.48 | 38.66 | 62.99 | 25.56 | 22.27 | 60.93 | 26.53 | 24.70 |
| Lane Group LOS | E | C | C | D | D | D | E | C | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 1.97 | 3.04 | 4.19 | 4.05 | 16.92 | 13.17 | 3.96 | 7.77 | 3.25 | 2.75 | 7.30 | 4.55 |
| 50th-Percentile Queue Length [ft/ln] | 49.29 | 75.91 | 104.74 | 101.37 | 423.10 | 329.35 | 99.00 | 194.13 | 81.35 | 68.84 | 182.54 | 113.63 |
| 95th-Percentile Queue Length [veh/ln] | 3.55 | 5.47 | 7.54 | 7.30 | 23.67 | 19.13 | 7.13 | 12.34 | 5.86 | 4.96 | 11.73 | 8.04 |
| 95th-Percentile Queue Length [ft/ln] | 88.73 | 136.63 | 188.52 | 182.47 | 591.77 | 478.16 | 178.21 | 308.38 | 146.43 | 123.92 | 293.33 | 201.03 |

**Movement, Approach, & Intersection Results**

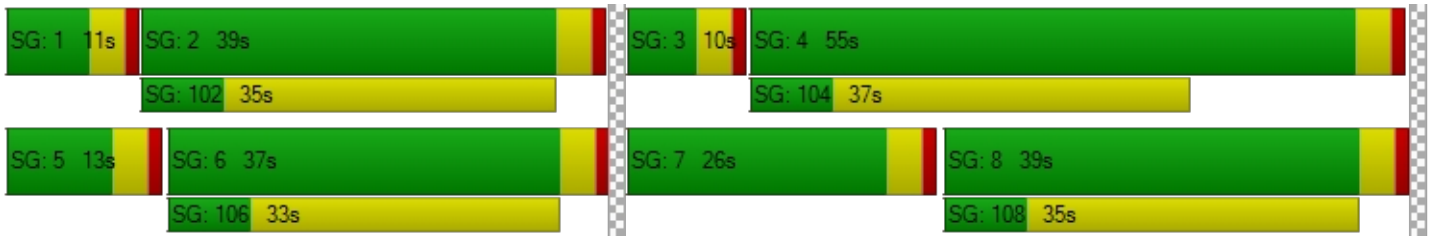
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 58.36 | 32.08 | 33.20 | 54.55 | 47.03 | 38.66 | 62.99 | 25.56 | 22.27 | 60.93 | 26.53 | 24.70 |
| Movement LOS | E | C | C | D | D | D | E | C | C | E | C | C |
| d_A, Approach Delay [s/veh] | 38.17 | | | 45.65 | | | 32.88 | | | 31.59 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 37.32 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.691 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 47.05 | 47.05 | 47.05 | 47.05 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.822 | 2.807 | 2.954 | 2.932 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 608 | 887 | 608 | 574 |
| d_b, Bicycle Delay [s] | 27.84 | 17.83 | 27.84 | 29.25 |
| l_b,int, Bicycle LOS Score for Intersection | 2.050 | 2.668 | 2.544 | 2.482 |
| Bicycle LOS | B | B | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 22.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.548 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 318 | 19 | 167 | 12 | 21 | 13 | 8 | 705 | 334 | 152 | 689 | 13 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 318 | 19 | 167 | 12 | 21 | 13 | 8 | 705 | 334 | 152 | 689 | 13 |
| Peak Hour Factor | 0.9600 | 0.9600 | 0.9600 | 0.7170 | 0.7170 | 0.7170 | 0.9350 | 0.9350 | 0.9350 | 0.9260 | 0.9260 | 0.9260 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 83 | 5 | 43 | 4 | 7 | 5 | 2 | 189 | 89 | 41 | 186 | 4 |
| Total Analysis Volume [veh/h] | 331 | 20 | 174 | 17 | 29 | 18 | 9 | 754 | 357 | 164 | 744 | 14 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 6 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 30 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 33 | 70 | 70 | 0 | 37 | 0 | 10 | 38 | 0 | 12 | 40 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 7 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 26 | 0 | 26 | 0 | 0 | 27 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | No | | No | | No | No | | No | No | |
| Maximum Recall | No | No | No | | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | No | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 14 | 23 | 35 | 5 | 5 | 2 | 77 | 77 | 8 | 83 | 83 |
| g / C, Green / Cycle | 0.12 | 0.19 | 0.29 | 0.04 | 0.04 | 0.01 | 0.64 | 0.64 | 0.07 | 0.69 | 0.69 |
| (v / s)_i Volume / Saturation Flow Rate | 0.09 | 0.01 | 0.09 | 0.01 | 0.02 | 0.01 | 0.31 | 0.28 | 0.05 | 0.20 | 0.20 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 |
| c, Capacity [veh/h] | 407 | 369 | 559 | 98 | 85 | 24 | 1214 | 1214 | 234 | 1316 | 1316 |
| d1, Uniform Delay [s] | 51.77 | 39.40 | 32.89 | 55.32 | 56.18 | 58.71 | 11.31 | 10.81 | 54.81 | 7.09 | 7.08 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 3.98 | 0.06 | 0.31 | 0.84 | 5.60 | 9.22 | 1.38 | 1.12 | 3.75 | 0.56 | 0.55 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.81 | 0.05 | 0.31 | 0.17 | 0.56 | 0.37 | 0.48 | 0.43 | 0.70 | 0.29 | 0.29 |
| d, Delay for Lane Group [s/veh] | 55.75 | 39.46 | 33.21 | 56.15 | 61.79 | 67.93 | 12.69 | 11.93 | 58.57 | 7.65 | 7.63 |
| Lane Group LOS | E | D | C | E | E | E | B | B | E | A | A |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 5.08 | 0.49 | 4.00 | 0.52 | 1.53 | 0.33 | 8.21 | 7.00 | 2.55 | 3.70 | 3.67 |
| 50th-Percentile Queue Length [ft/ln] | 127.09 | 12.28 | 100.12 | 13.00 | 38.20 | 8.34 | 205.29 | 175.06 | 63.76 | 92.41 | 91.65 |
| 95th-Percentile Queue Length [veh/ln] | 8.78 | 0.88 | 7.21 | 0.94 | 2.75 | 0.60 | 12.91 | 11.34 | 4.59 | 6.65 | 6.60 |
| 95th-Percentile Queue Length [ft/ln] | 219.53 | 22.10 | 180.22 | 23.40 | 68.76 | 15.00 | 322.78 | 283.55 | 114.77 | 166.33 | 164.98 |

**Movement, Approach, & Intersection Results**

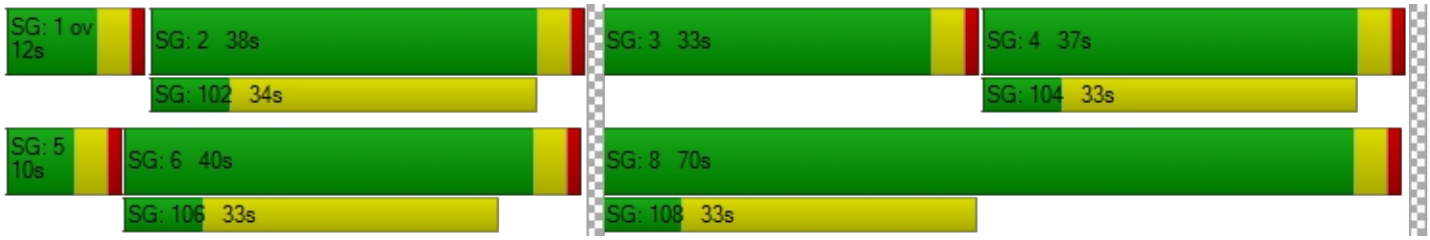
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 55.75 | 39.46 | 33.21 | 56.15 | 61.79 | 61.79 | 67.93 | 12.52 | 11.93 | 58.57 | 7.64 | 7.63 |
| Movement LOS | E | D | C | E | E | E | E | B | B | E | A | A |
| d_A, Approach Delay [s/veh] | 47.66 | | | 60.29 | | | 12.78 | | | 16.70 | | |
| Approach LOS | D | | | E | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 22.27 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.548 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.51 | 49.51 | 49.51 | 49.51 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.641 | 1.989 | 2.745 | 2.794 |
| Crosswalk LOS | B | A | B | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1100 | 550 | 567 | 600 |
| d_b, Bicycle Delay [s] | 12.16 | 31.54 | 30.82 | 29.41 |
| l_b,int, Bicycle LOS Score for Intersection | 2.426 | 1.665 | 2.484 | 2.320 |
| Bicycle LOS | B | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 20.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.246 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 21 | 273 | 111 | 69 | 259 | 20 | 34 | 11 | 58 | 80 | 4 | 57 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 21 | 273 | 111 | 69 | 259 | 20 | 34 | 11 | 58 | 80 | 4 | 57 |
| Peak Hour Factor | 0.9200 | 0.9200 | 0.9200 | 0.9030 | 0.9030 | 0.9030 | 0.6380 | 0.6380 | 0.6380 | 0.9310 | 0.9310 | 0.9310 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 6 | 74 | 30 | 19 | 72 | 6 | 13 | 4 | 23 | 21 | 1 | 15 |
| Total Analysis Volume [veh/h] | 23 | 297 | 121 | 76 | 287 | 22 | 53 | 17 | 91 | 86 | 4 | 61 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 26 | 0 | 10 | 26 | 0 | 0 | 54 | 0 | 0 | 54 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 12 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | L | C | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 3 | 66 | 66 | 5 | 68 | 68 | 7 | 7 | 7 | 7 |
| g / C, Green / Cycle | 0.03 | 0.73 | 0.73 | 0.06 | 0.76 | 0.76 | 0.08 | 0.08 | 0.08 | 0.08 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.11 | 0.11 | 0.04 | 0.08 | 0.08 | 0.03 | 0.06 | 0.05 | 0.03 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 55 | 1383 | 1383 | 104 | 1435 | 1435 | 133 | 154 | 93 | 154 |
| d1, Uniform Delay [s] | 42.88 | 3.76 | 3.72 | 41.73 | 2.93 | 2.93 | 39.19 | 40.33 | 39.95 | 39.39 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.05 | 0.24 | 0.22 | 9.39 | 0.15 | 0.15 | 1.91 | 5.76 | 28.68 | 1.85 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.42 | 0.16 | 0.15 | 0.73 | 0.11 | 0.11 | 0.40 | 0.70 | 0.93 | 0.42 |
| d, Delay for Lane Group [s/veh] | 47.93 | 4.00 | 3.95 | 51.12 | 3.08 | 3.08 | 41.11 | 46.09 | 68.63 | 41.23 |
| Lane Group LOS | D | A | A | D | A | A | D | D | E | D |
| Critical Lane Group | No | Yes | No | Yes | No | No | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.57 | 1.04 | 0.96 | 1.91 | 0.60 | 0.59 | 1.17 | 2.55 | 2.55 | 1.43 |
| 50th-Percentile Queue Length [ft/ln] | 14.37 | 26.09 | 24.06 | 47.83 | 15.11 | 14.85 | 29.23 | 63.71 | 63.87 | 35.81 |
| 95th-Percentile Queue Length [veh/ln] | 1.03 | 1.88 | 1.73 | 3.44 | 1.09 | 1.07 | 2.10 | 4.59 | 4.60 | 2.58 |
| 95th-Percentile Queue Length [ft/ln] | 25.87 | 46.96 | 43.32 | 86.10 | 27.20 | 26.73 | 52.61 | 114.68 | 114.96 | 64.45 |

**Movement, Approach, & Intersection Results**

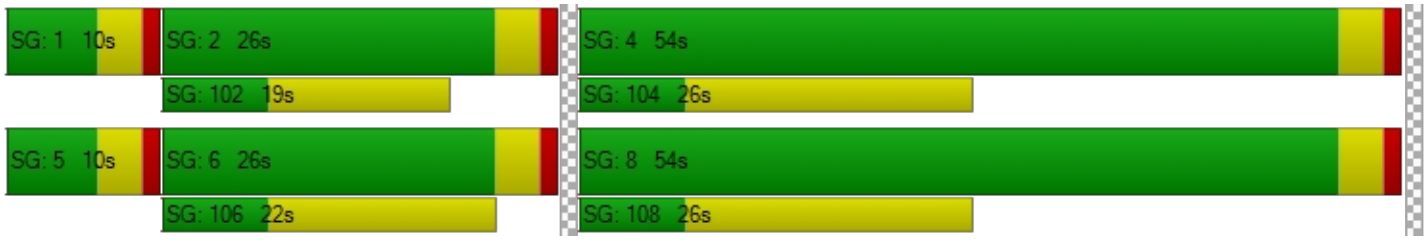
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 47.93 | 3.98 | 3.95 | 51.12 | 3.08 | 3.08 | 41.11 | 46.09 | 46.09 | 68.63 | 41.23 | 41.23 |
| Movement LOS | D | A | A | D | A | A | D | D | D | E | D | D |
| d_A, Approach Delay [s/veh] | 6.26 | | | 12.56 | | | 44.45 | | | 56.84 | | |
| Approach LOS | A | | | B | | | D | | | E | | |
| d_I, Intersection Delay [s/veh] | 20.51 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.246 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.598 | 2.530 | 2.008 | 2.058 |
| Crosswalk LOS | B | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 489 | 489 | 1111 | 1111 |
| d_b, Bicycle Delay [s] | 25.70 | 25.70 | 8.90 | 8.90 |
| l_b,int, Bicycle LOS Score for Intersection | 1.923 | 1.877 | 1.825 | 1.809 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 22.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.469 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 22 | 324 | 414 | 41 | 292 | 21 | 24 | 14 | 26 | 380 | 6 | 75 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 22 | 324 | 414 | 41 | 292 | 21 | 24 | 14 | 26 | 380 | 6 | 75 |
| Peak Hour Factor | 0.9560 | 0.9560 | 0.9560 | 0.8510 | 0.8510 | 0.8510 | 0.8970 | 0.8970 | 0.8970 | 0.8690 | 0.8690 | 0.8690 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 6 | 85 | 108 | 12 | 86 | 6 | 7 | 4 | 7 | 109 | 2 | 22 |
| Total Analysis Volume [veh/h] | 23 | 339 | 433 | 48 | 343 | 25 | 27 | 16 | 29 | 437 | 7 | 86 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 29 | 0 | 10 | 29 | 0 | 0 | 30 | 0 | 0 | 31 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 17 | 0 | 0 | 18 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | C | R | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 0.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 65 | 57 | 57 | 65 | 58 | 58 | 5 | 5 | 18 | 18 |
| g / C, Green / Cycle | 0.65 | 0.57 | 0.57 | 0.65 | 0.58 | 0.58 | 0.05 | 0.05 | 0.18 | 0.18 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.18 | 0.23 | 0.03 | 0.10 | 0.10 | 0.02 | 0.02 | 0.15 | 0.14 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 1190 | 1076 | 1076 | 1038 | 1106 | 1106 | 94 | 100 | 318 | 335 |
| d1, Uniform Delay [s] | 6.16 | 11.44 | 12.18 | 6.25 | 9.67 | 9.66 | 46.03 | 45.62 | 39.93 | 39.32 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.01 | 0.77 | 1.12 | 0.08 | 0.33 | 0.32 | 3.40 | 1.60 | 6.35 | 3.86 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.02 | 0.31 | 0.40 | 0.05 | 0.17 | 0.16 | 0.46 | 0.29 | 0.85 | 0.78 |
| d, Delay for Lane Group [s/veh] | 6.17 | 12.21 | 13.30 | 6.34 | 10.00 | 9.98 | 49.43 | 47.22 | 46.28 | 43.18 |
| Lane Group LOS | A | B | B | A | B | A | D | D | D | D |
| Critical Lane Group | No | No | Yes | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.16 | 4.00 | 5.46 | 0.36 | 1.89 | 1.86 | 1.12 | 0.73 | 6.91 | 6.39 |
| 50th-Percentile Queue Length [ft/ln] | 4.01 | 100.03 | 136.55 | 8.98 | 47.23 | 46.39 | 28.06 | 18.37 | 172.86 | 159.68 |
| 95th-Percentile Queue Length [veh/ln] | 0.29 | 7.20 | 9.29 | 0.65 | 3.40 | 3.34 | 2.02 | 1.32 | 11.23 | 10.53 |
| 95th-Percentile Queue Length [ft/ln] | 7.22 | 180.06 | 232.37 | 16.17 | 85.02 | 83.51 | 50.51 | 33.07 | 280.68 | 263.30 |

**Movement, Approach, & Intersection Results**

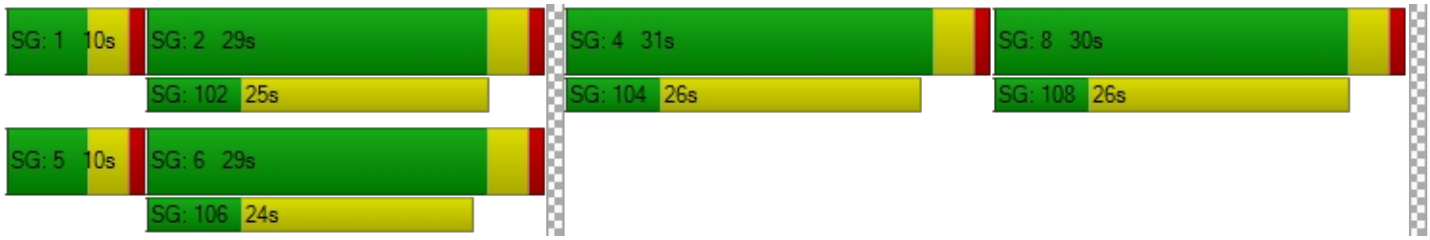
| d_M, Delay for Movement [s/veh] | 6.17 | 12.21 | 13.30 | 6.34 | 9.99 | 9.98 | 49.43 | 49.43 | 47.22 | 45.09 | 43.18 | 43.18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | A | B | B | A | A | A | D | D | D | D | D | D |
| d_A, Approach Delay [s/veh] | 12.63 | | | 9.57 | | | 48.54 | | | 44.76 | | |
| Approach LOS | B | | | A | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 22.75 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.469 | | | | | | | | | | | |

**Other Modes**

| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
|---|---|---|---|---|
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 39.62 | 39.62 | 39.62 | 39.62 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.617 | 2.474 | 2.006 | 2.319 |
| Crosswalk LOS | B | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 500 | 500 | 520 | 540 |
| d_b, Bicycle Delay [s] | 28.14 | 28.14 | 27.40 | 26.66 |
| l_b,int, Bicycle LOS Score for Intersection | 2.215 | 1.903 | 1.678 | 2.434 |
| Bicycle LOS | B | A | A | B |

## Sequence

| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 32.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.785 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 168 | 24 | 90 | 60 | 19 | 509 | 651 | 350 | 29 | 86 | 583 | 35 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 168 | 24 | 90 | 60 | 19 | 509 | 651 | 350 | 29 | 86 | 583 | 35 |
| Peak Hour Factor | 0.8300 | 0.8300 | 0.8300 | 0.8970 | 0.8970 | 0.8970 | 0.9440 | 0.9440 | 0.9440 | 0.8860 | 0.8860 | 0.8860 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 51 | 7 | 27 | 17 | 5 | 142 | 172 | 93 | 8 | 24 | 165 | 10 |
| Total Analysis Volume [veh/h] | 202 | 29 | 108 | 67 | 21 | 567 | 690 | 371 | 31 | 97 | 658 | 40 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 6 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 30 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 37 | 0 | 0 | 12 | 12 | 39 | 31 | 0 | 40 | 32 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 21 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | No | No | No | | No | No | |
| Maximum Recall | | No | | | No | No | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | No | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | C | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 12 | 12 | 12 | 8 | 8 | 59 | 31 | 76 | 76 | 8 | 53 | 53 |
| g / C, Green / Cycle | 0.10 | 0.10 | 0.10 | 0.07 | 0.07 | 0.49 | 0.26 | 0.63 | 0.63 | 0.07 | 0.44 | 0.44 |
| (v / s)_i Volume / Saturation Flow Rate | 0.05 | 0.08 | 0.06 | 0.04 | 0.01 | 0.30 | 0.20 | 0.11 | 0.10 | 0.05 | 0.19 | 0.18 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 1900 | 1900 |
| c, Capacity [veh/h] | 215 | 234 | 190 | 122 | 129 | 929 | 889 | 1195 | 1195 | 125 | 845 | 845 |
| d1, Uniform Delay [s] | 51.12 | 52.89 | 51.59 | 54.19 | 52.75 | 22.38 | 41.62 | 9.25 | 9.23 | 54.94 | 22.74 | 22.64 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.22 | 2.63 | 2.66 | 3.77 | 0.58 | 2.99 | 1.49 | 0.31 | 0.30 | 9.65 | 1.52 | 1.47 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.40 | 0.62 | 0.57 | 0.55 | 0.16 | 0.61 | 0.78 | 0.17 | 0.17 | 0.77 | 0.42 | 0.41 |
| d, Delay for Lane Group [s/veh] | 52.34 | 55.52 | 54.25 | 57.95 | 53.33 | 25.37 | 43.11 | 9.56 | 9.52 | 64.59 | 24.26 | 24.11 |
| Lane Group LOS | D | E | D | E | D | C | D | A | A | E | C | C |
| Critical Lane Group | No | Yes | No | No | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 2.55 | 4.42 | 3.25 | 2.09 | 0.62 | 12.21 | 9.62 | 2.26 | 2.19 | 3.22 | 7.13 | 6.96 |
| 50th-Percentile Queue Length [ft/ln] | 63.74 | 110.52 | 81.18 | 52.30 | 15.50 | 305.26 | 240.51 | 56.45 | 54.78 | 80.59 | 178.17 | 173.88 |
| 95th-Percentile Queue Length [veh/ln] | 4.59 | 7.87 | 5.84 | 3.77 | 1.12 | 17.94 | 14.71 | 4.06 | 3.94 | 5.80 | 11.51 | 11.28 |
| 95th-Percentile Queue Length [ft/ln] | 114.74 | 196.73 | 146.12 | 94.14 | 27.91 | 448.53 | 367.68 | 101.61 | 98.60 | 145.06 | 287.63 | 282.00 |

**Movement, Approach, & Intersection Results**

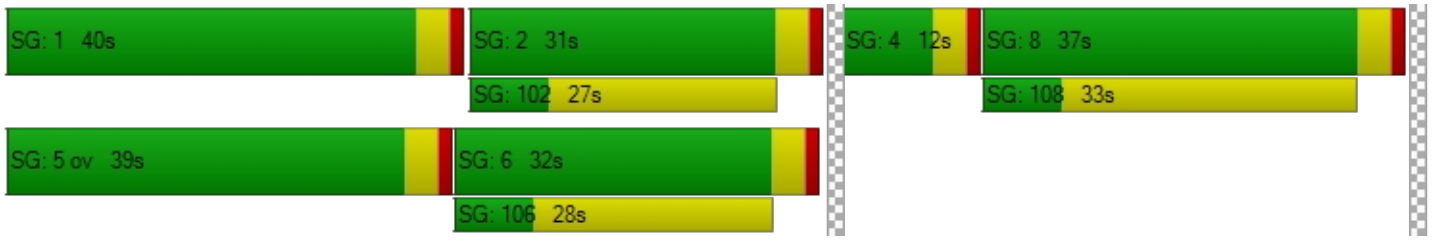
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 54.10 | 55.52 | 54.25 | 57.95 | 53.33 | 25.37 | 43.11 | 9.55 | 9.52 | 64.59 | 24.19 | 24.11 |
| Movement LOS | D | E | D | E | D | C | D | A | A | E | C | C |
| d_A, Approach Delay [s/veh] | 54.30 | | | 29.60 | | | 30.75 | | | 29.11 | | |
| Approach LOS | D | | | C | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 32.81 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.785 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 0.00 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.409 | 2.589 | 0.000 | 2.575 |
| Crosswalk LOS | B | B | F | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 550 | 133 | 450 | 466 |
| d_b, Bicycle Delay [s] | 31.57 | 52.30 | 36.07 | 35.30 |
| l_b,int, Bicycle LOS Score for Intersection | 2.119 | 2.100 | 2.461 | 2.215 |
| Bicycle LOS | B | B | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 38.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.705 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 343 | 746 | 198 | 210 | 775 | 270 | 315 | 1105 | 272 | 345 | 1206 | 175 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 343 | 746 | 198 | 210 | 775 | 270 | 315 | 1105 | 272 | 345 | 1206 | 175 |
| Peak Hour Factor | 0.9070 | 0.9070 | 0.9070 | 0.9640 | 0.9640 | 0.9640 | 0.9710 | 0.9710 | 0.9710 | 0.9600 | 0.9600 | 0.9600 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 95 | 206 | 55 | 54 | 201 | 70 | 81 | 285 | 70 | 90 | 314 | 46 |
| Total Analysis Volume [veh/h] | 378 | 822 | 218 | 218 | 804 | 280 | 324 | 1138 | 280 | 359 | 1256 | 182 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 20 | 46 | 0 | 13 | 39 | 0 | 20 | 42 | 0 | 19 | 41 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 31 | 0 | 0 | 28 | 0 | 0 | 31 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 15 | 28 | 28 | 9 | 22 | 22 | 13 | 53 | 53 | 14 | 54 | 54 |
| g / C, Green / Cycle | 0.12 | 0.23 | 0.23 | 0.08 | 0.18 | 0.18 | 0.11 | 0.44 | 0.44 | 0.12 | 0.45 | 0.45 |
| (v / s)_i Volume / Saturation Flow Rate | 0.11 | 0.14 | 0.11 | 0.06 | 0.14 | 0.15 | 0.09 | 0.25 | 0.24 | 0.10 | 0.22 | 0.10 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 438 | 1331 | 444 | 267 | 1053 | 351 | 388 | 1664 | 832 | 418 | 2543 | 848 |
| d1, Uniform Delay [s] | 51.55 | 41.24 | 39.87 | 54.65 | 46.48 | 46.83 | 52.32 | 25.41 | 25.00 | 51.91 | 23.63 | 20.38 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.20 | 0.47 | 0.84 | 6.04 | 1.18 | 4.18 | 4.74 | 1.47 | 2.61 | 5.27 | 0.69 | 0.58 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.86 | 0.62 | 0.49 | 0.82 | 0.76 | 0.80 | 0.83 | 0.58 | 0.55 | 0.86 | 0.49 | 0.21 |
| d, Delay for Lane Group [s/veh] | 56.75 | 41.71 | 40.71 | 60.69 | 47.66 | 51.01 | 57.06 | 26.88 | 27.61 | 57.18 | 24.32 | 20.96 |
| Lane Group LOS | E | D | D | E | D | D | E | C | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 5.89 | 7.32 | 5.69 | 3.47 | 7.70 | 8.39 | 5.04 | 10.52 | 10.13 | 5.61 | 8.51 | 3.27 |
| 50th-Percentile Queue Length [ft/ln] | 147.27 | 182.99 | 142.23 | 86.80 | 192.52 | 209.80 | 125.93 | 263.02 | 253.32 | 140.16 | 212.86 | 81.68 |
| 95th-Percentile Queue Length [veh/ln] | 9.87 | 11.76 | 9.60 | 6.25 | 12.25 | 13.14 | 8.72 | 15.84 | 15.35 | 9.49 | 13.30 | 5.88 |
| 95th-Percentile Queue Length [ft/ln] | 246.78 | 293.92 | 240.02 | 156.24 | 306.30 | 328.57 | 217.95 | 396.01 | 383.83 | 237.24 | 332.49 | 147.02 |

**Movement, Approach, & Intersection Results**

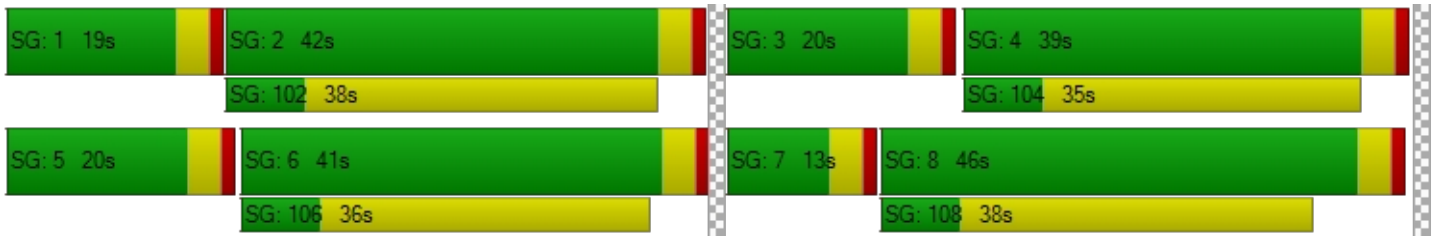
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 56.75 | 41.71 | 40.71 | 60.69 | 47.66 | 51.01 | 57.06 | 26.99 | 27.61 | 57.18 | 24.32 | 20.96 |
| Movement LOS | E | D | D | E | D | D | E | C | C | E | C | C |
| d_A, Approach Delay [s/veh] | 45.57 | | | 50.56 | | | 32.68 | | | 30.54 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 38.71 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.705 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.173 | 3.148 | 3.185 | 3.228 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 700 | 583 | 633 | 616 |
| d_b, Bicycle Delay [s] | 25.38 | 30.13 | 28.04 | 28.73 |
| l_b,int, Bicycle LOS Score for Intersection | 2.340 | 2.276 | 2.518 | 2.548 |
| Bicycle LOS | B | B | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 13.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.436 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 26 | 30 | 93 | 121 | 42 | 114 | 69 | 1269 | 36 | 77 | 1308 | 148 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 26 | 30 | 93 | 121 | 42 | 114 | 69 | 1269 | 36 | 77 | 1308 | 148 |
| Peak Hour Factor | 0.8200 | 0.8200 | 0.8200 | 0.7710 | 0.7710 | 0.7710 | 0.9890 | 0.9890 | 0.9890 | 0.9120 | 0.9120 | 0.9120 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 8 | 9 | 28 | 39 | 14 | 37 | 17 | 321 | 9 | 21 | 359 | 41 |
| Total Analysis Volume [veh/h] | 32 | 37 | 113 | 157 | 54 | 148 | 70 | 1283 | 36 | 84 | 1434 | 162 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 38 | 0 | 0 | 38 | 0 | 10 | 28 | 0 | 24 | 42 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 23 | 0 | 0 | 17 | 0 | 0 | 23 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 10 | 10 | 10 | 10 | 10 | 10 | 5 | 62 | 62 | 6 | 63 | 63 |
| g / C, Green / Cycle | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.06 | 0.69 | 0.69 | 0.06 | 0.70 | 0.70 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.02 | 0.06 | 0.09 | 0.01 | 0.08 | 0.04 | 0.23 | 0.24 | 0.05 | 0.25 | 0.09 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 229 | 219 | 219 | 221 | 438 | 219 | 101 | 2621 | 1310 | 111 | 3963 | 1321 |
| d1, Uniform Delay [s] | 35.89 | 35.95 | 37.48 | 38.62 | 35.76 | 38.23 | 41.73 | 5.62 | 5.68 | 41.56 | 5.58 | 4.57 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.28 | 0.36 | 1.88 | 4.21 | 0.13 | 3.62 | 8.15 | 0.34 | 0.72 | 9.84 | 0.26 | 0.19 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.14 | 0.17 | 0.52 | 0.71 | 0.12 | 0.68 | 0.69 | 0.33 | 0.34 | 0.75 | 0.36 | 0.12 |
| d, Delay for Lane Group [s/veh] | 36.16 | 36.31 | 39.36 | 42.83 | 35.88 | 41.85 | 49.88 | 5.96 | 6.40 | 51.40 | 5.84 | 4.76 |
| Lane Group LOS | D | D | D | D | D | D | D | A | A | D | A | A |
| Critical Lane Group | No | No | No | Yes | No | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.64 | 0.75 | 2.43 | 3.57 | 0.53 | 3.31 | 1.74 | 2.86 | 3.13 | 2.12 | 3.10 | 0.90 |
| 50th-Percentile Queue Length [ft/ln] | 16.12 | 18.71 | 60.68 | 89.23 | 13.37 | 82.75 | 43.47 | 71.50 | 78.14 | 52.96 | 77.62 | 22.62 |
| 95th-Percentile Queue Length [veh/ln] | 1.16 | 1.35 | 4.37 | 6.42 | 0.96 | 5.96 | 3.13 | 5.15 | 5.63 | 3.81 | 5.59 | 1.63 |
| 95th-Percentile Queue Length [ft/ln] | 29.01 | 33.68 | 109.22 | 160.61 | 24.07 | 148.94 | 78.25 | 128.70 | 140.65 | 95.33 | 139.72 | 40.71 |

**Movement, Approach, & Intersection Results**

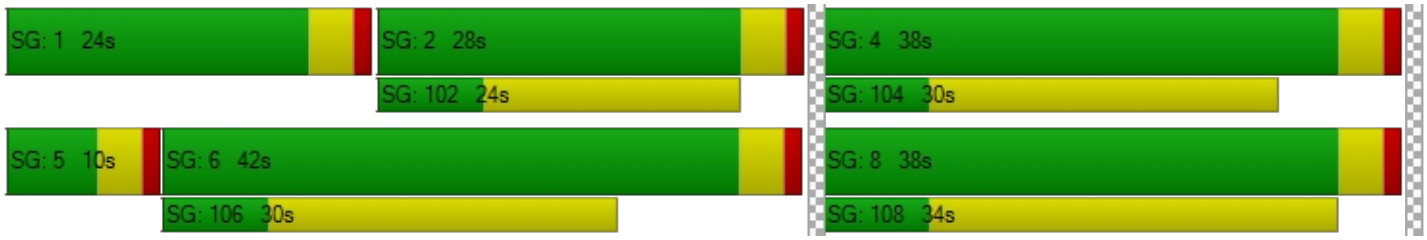
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 36.16 | 36.31 | 39.36 | 42.83 | 35.88 | 41.85 | 49.88 | 6.10 | 6.40 | 51.40 | 5.84 | 4.76 |
| Movement LOS | D | D | D | D | D | D | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 38.18 | | | 41.38 | | | 8.32 | | | 8.01 | | |
| Approach LOS | D | | | D | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 12.97 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.436 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.369 | 2.422 | 3.057 | 3.342 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 755 | 755 | 533 | 844 |
| d_b, Bicycle Delay [s] | 17.43 | 17.43 | 24.21 | 15.03 |
| l_b,int, Bicycle LOS Score for Intersection | 1.860 | 1.856 | 2.324 | 2.484 |
| Bicycle LOS | A | A | B | B |

## Sequence

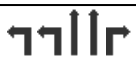
| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 40.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.845 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 399 | 471 | 260 | 259 | 826 | 173 | 176 | 1379 | 255 | 333 | 1305 | 145 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 399 | 471 | 260 | 259 | 826 | 173 | 176 | 1379 | 255 | 333 | 1305 | 145 |
| Peak Hour Factor | 0.9240 | 0.9240 | 0.9240 | 0.9170 | 0.9170 | 0.9170 | 0.9130 | 0.9130 | 0.9130 | 0.8900 | 0.8900 | 0.8900 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 108 | 127 | 70 | 71 | 225 | 47 | 48 | 378 | 70 | 94 | 367 | 41 |
| Total Analysis Volume [veh/h] | 432 | 510 | 281 | 282 | 901 | 189 | 193 | 1510 | 279 | 374 | 1466 | 163 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 21 | 41 | 0 | 19 | 39 | 0 | 12 | 41 | 0 | 19 | 48 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 17 | 36 | 36 | 12 | 31 | 31 | 8 | 41 | 41 | 15 | 48 | 48 |
| g / C, Green / Cycle | 0.14 | 0.30 | 0.30 | 0.10 | 0.26 | 0.26 | 0.07 | 0.34 | 0.34 | 0.12 | 0.40 | 0.40 |
| (v / s)_i Volume / Saturation Flow Rate | 0.12 | 0.09 | 0.15 | 0.08 | 0.24 | 0.10 | 0.06 | 0.26 | 0.15 | 0.11 | 0.26 | 0.09 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 488 | 1719 | 573 | 347 | 992 | 496 | 238 | 1956 | 652 | 431 | 2270 | 757 |
| d1, Uniform Delay [s] | 50.75 | 32.18 | 34.39 | 53.03 | 42.98 | 36.41 | 55.21 | 35.25 | 30.37 | 51.72 | 29.28 | 23.79 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.56 | 0.10 | 0.65 | 4.64 | 3.56 | 0.48 | 6.50 | 3.03 | 2.05 | 5.46 | 1.43 | 0.65 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.89 | 0.30 | 0.49 | 0.81 | 0.91 | 0.38 | 0.81 | 0.77 | 0.43 | 0.87 | 0.65 | 0.22 |
| d, Delay for Lane Group [s/veh] | 56.31 | 32.28 | 35.04 | 57.66 | 46.53 | 36.89 | 61.71 | 38.28 | 32.42 | 57.17 | 30.72 | 24.45 |
| Lane Group LOS | E | C | D | E | D | D | E | D | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 6.74 | 3.82 | 6.83 | 4.39 | 13.33 | 4.63 | 3.10 | 13.56 | 6.59 | 5.85 | 11.59 | 3.20 |
| 50th-Percentile Queue Length [ft/ln] | 168.54 | 95.56 | 170.71 | 109.79 | 333.23 | 115.74 | 77.42 | 339.10 | 164.69 | 146.23 | 289.86 | 79.94 |
| 95th-Percentile Queue Length [veh/ln] | 11.00 | 6.88 | 11.11 | 7.83 | 19.32 | 8.16 | 5.57 | 19.60 | 10.80 | 9.82 | 17.18 | 5.76 |
| 95th-Percentile Queue Length [ft/ln] | 275.00 | 172.02 | 277.85 | 195.71 | 482.92 | 203.96 | 139.36 | 490.11 | 269.92 | 245.39 | 429.47 | 143.90 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 56.31 | 32.28 | 35.04 | 57.66 | 46.53 | 36.89 | 61.71 | 38.28 | 32.42 | 57.17 | 30.72 | 24.45 |
| Movement LOS | E | C | D | E | D | D | E | D | C | E | C | C |
| d_A, Approach Delay [s/veh] | 41.40 | | | 47.49 | | | 39.73 | | | 35.15 | | |
| Approach LOS | D | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 40.26 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.845 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.078 | 3.012 | 3.304 | 3.305 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 616 | 583 | 616 | 733 |
| d_b, Bicycle Delay [s] | 28.73 | 30.13 | 28.73 | 24.09 |
| l_b,int, Bicycle LOS Score for Intersection | 2.232 | 2.692 | 2.650 | 2.661 |
| Bicycle LOS | B | B | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 36.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.810 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 67 | 38 | 172 | 398 | 76 | 285 | 307 | 1422 | 32 | 109 | 1561 | 450 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 67 | 38 | 172 | 398 | 76 | 285 | 307 | 1422 | 32 | 109 | 1561 | 450 |
| Peak Hour Factor | 0.8250 | 0.8250 | 0.8250 | 0.9010 | 0.9010 | 0.9010 | 0.9400 | 0.9400 | 0.9400 | 0.9820 | 0.9820 | 0.9820 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 20 | 12 | 52 | 110 | 21 | 79 | 82 | 378 | 9 | 28 | 397 | 115 |
| Total Analysis Volume [veh/h] | 81 | 46 | 208 | 442 | 84 | 316 | 327 | 1513 | 34 | 111 | 1590 | 458 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 110 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 10 | 0 | 0 | 44 | 0 | 16 | 44 | 0 | 12 | 40 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 28 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 14 | 14 | 14 | 27 | 27 | 12 | 45 | 45 | 8 | 41 | 41 |
| g / C, Green / Cycle | 0.13 | 0.13 | 0.13 | 0.24 | 0.24 | 0.11 | 0.41 | 0.41 | 0.07 | 0.37 | 0.37 |
| (v / s)_i Volume / Saturation Flow Rate | 0.05 | 0.03 | 0.11 | 0.13 | 0.21 | 0.09 | 0.27 | 0.28 | 0.06 | 0.28 | 0.24 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 3500 | 1900 | 3500 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 234 | 234 | 246 | 848 | 460 | 384 | 1556 | 778 | 132 | 2127 | 709 |
| d1, Uniform Delay [s] | 43.66 | 42.79 | 46.82 | 36.19 | 40.05 | 48.14 | 26.23 | 26.62 | 50.37 | 30.00 | 28.50 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.15 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.88 | 0.41 | 7.68 | 0.50 | 6.93 | 5.41 | 2.16 | 4.77 | 13.05 | 2.45 | 4.50 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.35 | 0.20 | 0.84 | 0.52 | 0.87 | 0.85 | 0.65 | 0.68 | 0.84 | 0.75 | 0.65 |
| d, Delay for Lane Group [s/veh] | 44.54 | 43.19 | 54.50 | 36.69 | 46.98 | 53.55 | 28.39 | 31.38 | 63.42 | 32.45 | 33.00 |
| Lane Group LOS | D | D | D | D | D | D | C | C | E | C | C |
| Critical Lane Group | No | No | Yes | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 2.07 | 1.15 | 6.07 | 5.19 | 11.17 | 4.68 | 11.00 | 12.14 | 3.49 | 12.43 | 10.70 |
| 50th-Percentile Queue Length [ft/ln] | 51.74 | 28.66 | 151.70 | 129.78 | 279.17 | 116.96 | 274.93 | 303.44 | 87.25 | 310.81 | 267.44 |
| 95th-Percentile Queue Length [veh/ln] | 3.73 | 2.06 | 10.11 | 8.93 | 16.65 | 8.23 | 16.44 | 17.85 | 6.28 | 18.21 | 16.06 |
| 95th-Percentile Queue Length [ft/ln] | 93.13 | 51.59 | 252.69 | 223.20 | 416.18 | 205.64 | 410.89 | 446.28 | 157.05 | 455.37 | 401.54 |

**Movement, Approach, & Intersection Results**

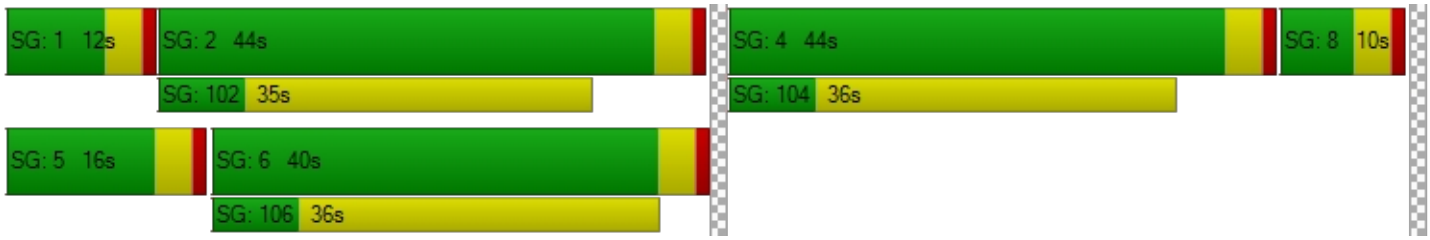
| d_M, Delay for Movement [s/veh] | 44.54 | 43.19 | 54.50 | 36.69 | 46.98 | 46.98 | 53.55 | 29.37 | 31.38 | 63.42 | 32.45 | 33.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | D | D | D | D | D | D | D | C | C | E | C | C |
| d_A, Approach Delay [s/veh] | 50.54 | | | 41.58 | | | 33.63 | | | 34.16 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 36.22 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.810 | | | | | | | | | | | |

**Other Modes**

| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
|---|---|---|---|---|
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 44.58 | 44.58 | 44.58 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.278 | 2.636 | 3.206 | 0.000 |
| Crosswalk LOS | B | B | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 109 | 727 | 727 | 654 |
| d_b, Bicycle Delay [s] | 49.19 | 22.29 | 22.29 | 24.91 |
| l_b,int, Bicycle LOS Score for Intersection | 1.836 | 2.949 | 2.590 | 2.747 |
| Bicycle LOS | A | C | B | B |

## Sequence

| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 111.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | F |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.241 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 265 | 499 | 562 | 561 | 376 | 177 | 132 | 1491 | 176 | 633 | 1763 | 922 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 265 | 499 | 562 | 561 | 376 | 177 | 132 | 1491 | 176 | 633 | 1763 | 922 |
| Peak Hour Factor | 0.9800 | 0.9800 | 0.9800 | 0.8330 | 0.8330 | 0.8330 | 0.9250 | 0.9250 | 0.9250 | 0.9230 | 0.9230 | 0.9230 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 68 | 127 | 143 | 168 | 113 | 53 | 36 | 403 | 48 | 171 | 478 | 250 |
| Total Analysis Volume [veh/h] | 270 | 509 | 573 | 673 | 451 | 212 | 143 | 1612 | 190 | 686 | 1910 | 999 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 29 | 41 | 0 | 27 | 39 | 0 | 10 | 34 | 0 | 18 | 42 | 42 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 23 | 0 | 0 | 23 | 23 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 12 | 37 | 37 | 23 | 48 | 48 | 6 | 30 | 30 | 14 | 38 | 65 |
| g / C, Green / Cycle | 0.10 | 0.31 | 0.31 | 0.19 | 0.40 | 0.40 | 0.05 | 0.25 | 0.25 | 0.12 | 0.32 | 0.54 |
| (v / s)_i Volume / Saturation Flow Rate | 0.08 | 0.13 | 0.30 | 0.34 | 0.18 | 0.17 | 0.04 | 0.24 | 0.24 | 0.20 | 0.34 | 0.53 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 2000 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 342 | 1166 | 583 | 383 | 762 | 762 | 176 | 1432 | 477 | 409 | 1811 | 1031 |
| d1, Uniform Delay [s] | 52.96 | 33.30 | 41.29 | 48.51 | 26.36 | 25.82 | 56.43 | 44.01 | 44.38 | 53.00 | 40.94 | 26.45 |
| k, delay calibration | 0.11 | 0.11 | 0.44 | 0.21 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.11 | 0.26 | 31.19 | 344.32 | 0.43 | 0.36 | 8.60 | 12.92 | 32.80 | 306.85 | 37.21 | 21.41 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.79 | 0.44 | 0.98 | 1.76 | 0.46 | 0.41 | 0.81 | 0.94 | 0.96 | 1.68 | 1.05 | 0.97 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 57.07 | 33.55 | 72.48 | 392.83 | 26.79 | 26.18 | 65.02 | 56.94 | 77.18 | 359.85 | 78.15 | 47.86 |
| Lane Group LOS | E | C | E | F | C | C | E | E | E | F | F | D |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 4.17 | 5.98 | 21.63 | 24.05 | 7.35 | 6.53 | 2.36 | 14.65 | 17.74 | 23.59 | 23.83 | 32.20 |
| 50th-Percentile Queue Length [ft/ln] | 104.36 | 149.46 | 540.63 | 601.15 | 183.72 | 163.20 | 58.90 | 366.25 | 443.41 | 589.73 | 595.74 | 805.07 |
| 95th-Percentile Queue Length [veh/ln] | 7.51 | 9.99 | 29.25 | 39.43 | 11.79 | 10.72 | 4.24 | 20.93 | 24.64 | 37.37 | 32.97 | 41.51 |
| 95th-Percentile Queue Length [ft/ln] | 187.85 | 249.70 | 731.29 | 985.67 | 294.86 | 267.96 | 106.02 | 523.17 | 616.08 | 934.34 | 824.35 | 1037.73 |

**Movement, Approach, & Intersection Results**

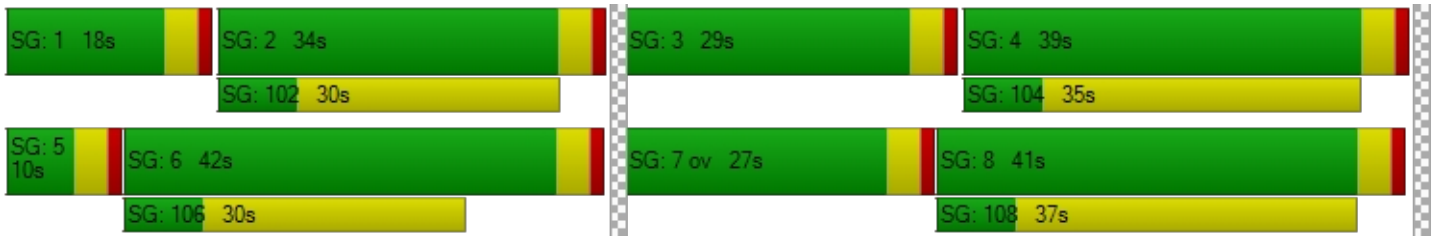
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 57.07 | 33.55 | 72.48 | 392.83 | 26.65 | 26.18 | 65.02 | 60.32 | 77.18 | 359.85 | 78.15 | 47.86 |
| Movement LOS | E | C | E | F | C | C | E | E | E | F | F | D |
| d_A, Approach Delay [s/veh] | 54.75 | | | 211.04 | | | 62.31 | | | 123.49 | | |
| Approach LOS | D | | | F | | | E | | | F | | |
| d_I, Intersection Delay [s/veh] | 111.95 | | | | | | | | | | | |
| Intersection LOS | F | | | | | | | | | | | |
| Intersection V/C | 1.241 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.51 | 49.51 | 49.51 | 49.51 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.981 | 2.952 | 3.333 | 3.609 |
| Crosswalk LOS | C | C | C | D |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 617 | 583 | 500 | 633 |
| d_b, Bicycle Delay [s] | 28.71 | 30.11 | 33.76 | 28.02 |
| l_b,int, Bicycle LOS Score for Intersection | 2.675 | 2.662 | 2.362 | 3.537 |
| Bicycle LOS | B | B | B | D |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 17.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.771 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 536 | 0 | 726 | 0 | 1895 | 1011 | 0 | 2455 | 353 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 536 | 0 | 726 | 0 | 1895 | 1011 | 0 | 2455 | 353 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 0.9240 | 1.0000 | 0.9240 | 1.0000 | 0.9460 | 0.9460 | 1.0000 | 0.9730 | 0.9730 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 145 | 0 | 196 | 0 | 501 | 267 | 0 | 631 | 91 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 580 | 0 | 786 | 0 | 2003 | 1069 | 0 | 2523 | 363 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_di, Inbound Pedestrian Volume crossing m | | 0 | | | 0 | | | 0 | | | 0 | |
| v_co, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ci, Inbound Pedestrian Volume crossing mi | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ab, Corner Pedestrian Volume [ped/h] | | 0 | | | 0 | | | 0 | | | 0 | |
| Bicycle Volume [bicycles/h] | | 0 | | | 0 | | | 0 | | | 0 | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 8.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 64 | 0 | 0 | 0 | 26 | 0 | 0 | 26 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | | No | |
| Maximum Recall | | | | No | | | | No | | | No | |
| Pedestrian Recall | | | | No | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | C | R | C | C |
|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 28 | 28 | 28 | 54 | 54 |
| g / C, Green / Cycle | | 0.31 | 0.31 | 0.31 | 0.60 | 0.60 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.26 | 0.26 | 0.24 | 0.35 | 0.44 |
| s, saturation flow rate [veh/h] | | 1750 | 1750 | 1900 | 5700 | 5700 |
| c, Capacity [veh/h] | | 544 | 544 | 591 | 3420 | 3420 |
| d1, Uniform Delay [s] | | 28.82 | 28.82 | 28.04 | 11.08 | 12.90 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 3.50 | 3.50 | 2.17 | 0.74 | 1.46 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.84 | 0.84 | 0.77 | 0.59 | 0.74 |
| d, Delay for Lane Group [s/veh] | | 32.32 | 32.32 | 30.21 | 11.82 | 14.36 |
| Lane Group LOS | | C | C | C | B | B |
| Critical Lane Group | | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | | 9.34 | 9.34 | 8.92 | 7.56 | 11.21 |
| 50th-Percentile Queue Length [ft/ln] | | 233.39 | 233.39 | 223.12 | 189.10 | 280.16 |
| 95th-Percentile Queue Length [veh/ln] | | 14.35 | 14.35 | 13.82 | 12.07 | 16.70 |
| 95th-Percentile Queue Length [ft/ln] | | 358.67 | 358.67 | 345.61 | 301.86 | 417.41 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 32.32 | 0.00 | 31.10 | 0.00 | 11.82 | 0.00 | 0.00 | 14.36 | 0.00 |
| Movement LOS | | | | C | | C | | B | | | B | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 31.62 | | | 11.82 | | | 14.36 | | |
| Approach LOS | A | | | C | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 17.50 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.771 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 0.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 0.00 | 34.63 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 0.000 | 2.463 | 0.000 | 0.000 |
| Crosswalk LOS | F | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 1335 | 489 | 489 |
| d_b, Bicycle Delay [s] | 44.96 | 4.98 | 25.65 | 25.65 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 3.814 | 2.661 | 2.947 |
| Bicycle LOS | D | D | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 36.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.871 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1261 | 117 | 552 | 0 | 0 | 371 | 388 | 1727 | 554 | 0 | 1771 | 60 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1261 | 117 | 552 | 0 | 0 | 371 | 388 | 1727 | 554 | 0 | 1771 | 60 |
| Peak Hour Factor | 0.9320 | 0.9320 | 0.9320 | 1.0000 | 1.0000 | 0.8040 | 0.9340 | 0.9340 | 0.9340 | 1.0000 | 0.9510 | 0.9510 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 338 | 31 | 148 | 0 | 0 | 115 | 104 | 462 | 148 | 0 | 466 | 16 |
| Total Analysis Volume [veh/h] | 1353 | 126 | 592 | 0 | 0 | 461 | 415 | 1849 | 593 | 0 | 1862 | 63 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 0 | 6 | 6 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 47 | 0 | 0 | 0 | 43 | 43 | 73 | 0 | 0 | 30 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | | No | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | | No | No | No | | | No | |
| Maximum Recall | | No | | | | No | No | No | | | No | |
| Pedestrian Recall | | No | | | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 40 | 40 | 40 | 31 | 31 | 72 | 37 | 37 |
| g / C, Green / Cycle | 0.33 | 0.33 | 0.33 | 0.26 | 0.26 | 0.60 | 0.31 | 0.31 |
| (v / s)_i Volume / Saturation Flow Rate | 0.29 | 0.30 | 0.28 | 0.12 | 0.23 | 0.32 | 0.25 | 0.25 |
| s, saturation flow rate [veh/h] | 3500 | 1750 | 1900 | 3800 | 1800 | 5700 | 5700 | 1900 |
| c, Capacity [veh/h] | 1171 | 586 | 636 | 971 | 460 | 3413 | 1766 | 589 |
| d1, Uniform Delay [s] | 37.47 | 37.94 | 36.70 | 37.82 | 43.19 | 14.29 | 38.26 | 38.26 |
| k, delay calibration | 0.11 | 0.34 | 0.29 | 0.11 | 0.24 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 2.17 | 14.12 | 7.25 | 0.36 | 13.50 | 0.62 | 4.34 | 11.97 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.87 | 0.90 | 0.83 | 0.47 | 0.90 | 0.54 | 0.82 | 0.82 |
| d, Delay for Lane Group [s/veh] | 39.64 | 52.06 | 43.94 | 38.18 | 56.69 | 14.92 | 42.60 | 50.23 |
| Lane Group LOS | D | D | D | D | E | B | D | D |
| Critical Lane Group | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 14.24 | 16.77 | 15.28 | 5.80 | 13.55 | 9.77 | 13.68 | 14.93 |
| 50th-Percentile Queue Length [ft/ln] | 355.92 | 419.34 | 382.07 | 144.95 | 338.65 | 244.24 | 342.06 | 373.24 |
| 95th-Percentile Queue Length [veh/ln] | 20.42 | 23.49 | 21.69 | 9.75 | 19.58 | 14.90 | 19.75 | 21.27 |
| 95th-Percentile Queue Length [ft/ln] | 510.62 | 587.26 | 542.35 | 243.67 | 489.55 | 372.39 | 493.72 | 531.66 |

**Movement, Approach, & Intersection Results**

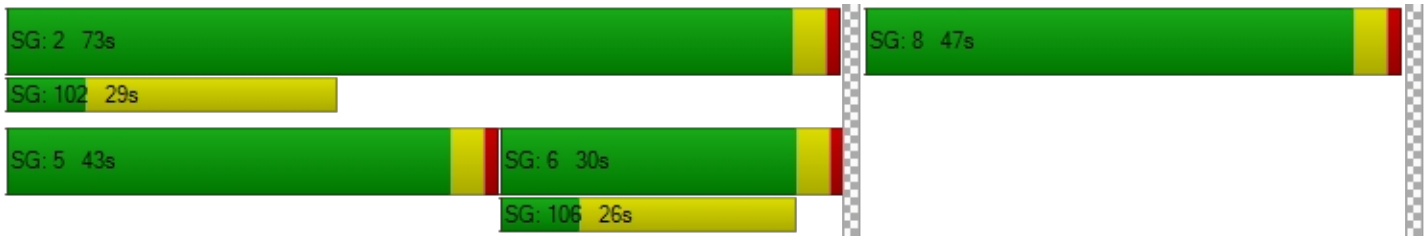
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 42.62 | 52.06 | 44.96 | 0.00 | 0.00 | 38.18 | 56.69 | 14.92 | 0.00 | 0.00 | 44.32 | 50.23 |
| Movement LOS | D | D | D | | | D | E | B | | | D | D |
| d_A, Approach Delay [s/veh] | 43.88 | | | 38.18 | | | 22.57 | | | 44.51 | | |
| Approach LOS | D | | | D | | | C | | | D | | |
| d_I, Intersection Delay [s/veh] | 36.49 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.871 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.49 | 49.49 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.717 | 2.300 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 717 | 650 | 1150 | 433 |
| d_b, Bicycle Delay [s] | 24.69 | 27.32 | 10.83 | 36.80 |
| l_b,int, Bicycle LOS Score for Intersection | 4.977 | 1.560 | 2.805 | 2.354 |
| Bicycle LOS | E | A | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 34.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.767 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 238 | 181 | 109 | 324 | 233 | 180 | 211 | 1652 | 239 | 144 | 1449 | 205 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 238 | 181 | 109 | 324 | 233 | 180 | 211 | 1652 | 239 | 144 | 1449 | 205 |
| Peak Hour Factor | 0.9140 | 0.9140 | 0.9140 | 0.8970 | 0.8970 | 0.8970 | 0.9020 | 0.9020 | 0.9020 | 0.9490 | 0.9490 | 0.9490 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 65 | 50 | 30 | 90 | 65 | 50 | 58 | 458 | 66 | 38 | 382 | 54 |
| Total Analysis Volume [veh/h] | 260 | 198 | 119 | 361 | 260 | 201 | 234 | 1831 | 265 | 152 | 1527 | 216 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 14 | 39 | 0 | 17 | 42 | 0 | 23 | 49 | 0 | 15 | 41 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 29 | 0 | 0 | 26 | 0 | 0 | 25 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 10 | 16 | 16 | 13 | 19 | 19 | 17 | 64 | 64 | 11 | 57 | 57 |
| g / C, Green / Cycle | 0.08 | 0.13 | 0.13 | 0.11 | 0.16 | 0.16 | 0.15 | 0.53 | 0.53 | 0.09 | 0.48 | 0.48 |
| (v / s)_i Volume / Saturation Flow Rate | 0.07 | 0.09 | 0.08 | 0.10 | 0.14 | 0.11 | 0.13 | 0.37 | 0.37 | 0.08 | 0.23 | 0.23 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 294 | 256 | 256 | 381 | 303 | 303 | 262 | 2018 | 1009 | 166 | 2724 | 908 |
| d1, Uniform Delay [s] | 54.42 | 49.31 | 48.82 | 53.16 | 49.15 | 47.44 | 50.38 | 20.84 | 20.93 | 54.03 | 21.21 | 21.30 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 8.72 | 2.83 | 2.13 | 12.19 | 7.02 | 2.49 | 10.23 | 1.96 | 3.96 | 17.41 | 0.60 | 1.85 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.88 | 0.65 | 0.59 | 0.95 | 0.86 | 0.66 | 0.89 | 0.69 | 0.70 | 0.92 | 0.48 | 0.48 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 63.14 | 52.14 | 50.95 | 65.35 | 56.17 | 49.93 | 60.61 | 22.80 | 24.89 | 71.44 | 21.82 | 23.15 |
| Lane Group LOS | E | D | D | E | E | D | E | C | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 4.24 | 4.97 | 4.37 | 6.05 | 8.17 | 5.86 | 7.63 | 14.56 | 15.28 | 5.35 | 8.32 | 8.78 |
| 50th-Percentile Queue Length [ft/ln] | 106.03 | 124.15 | 109.36 | 151.16 | 204.16 | 146.57 | 190.83 | 363.91 | 381.91 | 133.76 | 207.93 | 219.41 |
| 95th-Percentile Queue Length [veh/ln] | 7.62 | 8.62 | 7.80 | 10.08 | 12.85 | 9.83 | 12.16 | 20.81 | 21.69 | 9.14 | 13.05 | 13.63 |
| 95th-Percentile Queue Length [ft/ln] | 190.47 | 215.52 | 195.11 | 251.98 | 321.32 | 245.84 | 304.10 | 520.34 | 542.16 | 228.60 | 326.18 | 340.87 |

**Movement, Approach, & Intersection Results**

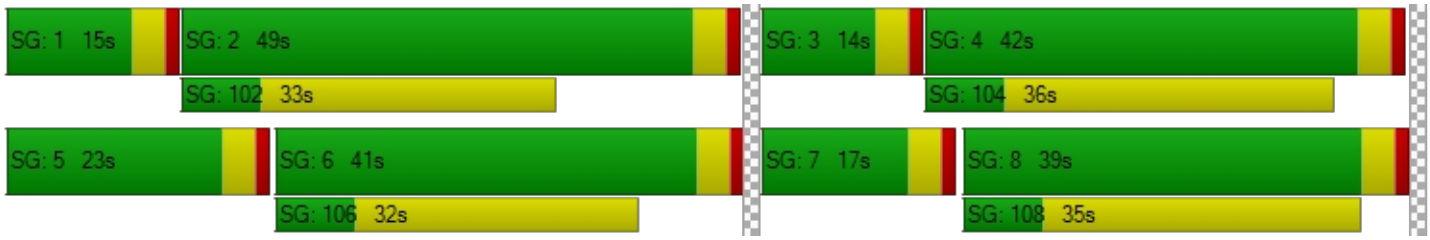
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 63.14 | 51.96 | 50.95 | 65.35 | 56.17 | 49.93 | 60.61 | 23.30 | 24.89 | 71.44 | 22.01 | 23.15 |
| Movement LOS | E | D | D | E | E | D | E | C | C | E | C | C |
| d_A, Approach Delay [s/veh] | 56.79 | | | 58.68 | | | 27.23 | | | 26.11 | | |
| Approach LOS | E | | | E | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 34.48 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.767 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 49.52 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.558 | 2.706 | 3.265 | 3.252 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 583 | 633 | 750 | 617 |
| d_b, Bicycle Delay [s] | 30.12 | 28.03 | 23.45 | 28.72 |
| l_b,int, Bicycle LOS Score for Intersection | 2.036 | 2.916 | 2.841 | 2.341 |
| Bicycle LOS | B | C | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 20.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.750 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 154 | 17 | 231 | 25 | 11 | 12 | 24 | 1817 | 272 | 200 | 1727 | 45 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 154 | 17 | 231 | 25 | 11 | 12 | 24 | 1817 | 272 | 200 | 1727 | 45 |
| Peak Hour Factor | 0.9770 | 0.9770 | 0.9770 | 0.8650 | 0.8650 | 0.8650 | 0.9010 | 0.9010 | 0.9010 | 0.9030 | 0.9030 | 0.9030 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 39 | 4 | 59 | 7 | 3 | 3 | 7 | 504 | 75 | 55 | 478 | 12 |
| Total Analysis Volume [veh/h] | 158 | 17 | 236 | 29 | 13 | 14 | 27 | 2017 | 302 | 221 | 1913 | 50 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 26 | 0 | 0 | 10 | 0 | 10 | 32 | 0 | 22 | 44 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 14 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 14 | 14 | 14 | 5 | 5 | 3 | 43 | 43 | 13 | 53 | 53 |
| g / C, Green / Cycle | 0.15 | 0.15 | 0.15 | 0.05 | 0.05 | 0.03 | 0.47 | 0.47 | 0.14 | 0.59 | 0.59 |
| (v / s)_i Volume / Saturation Flow Rate | 0.05 | 0.05 | 0.12 | 0.02 | 0.01 | 0.02 | 0.35 | 0.16 | 0.12 | 0.34 | 0.35 |
| s, saturation flow rate [veh/h] | 1750 | 1750 | 1900 | 1800 | 1900 | 1800 | 5700 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 267 | 267 | 289 | 93 | 98 | 61 | 2699 | 900 | 261 | 2221 | 1111 |
| d1, Uniform Delay [s] | 34.10 | 34.11 | 36.99 | 41.23 | 41.15 | 42.70 | 19.35 | 14.86 | 37.55 | 11.79 | 12.04 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.71 | 0.72 | 5.56 | 1.90 | 1.51 | 4.87 | 1.94 | 1.01 | 7.34 | 1.12 | 2.45 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.33 | 0.33 | 0.82 | 0.31 | 0.28 | 0.44 | 0.75 | 0.34 | 0.85 | 0.58 | 0.60 |
| d, Delay for Lane Group [s/veh] | 34.80 | 34.83 | 42.56 | 43.12 | 42.65 | 47.57 | 21.29 | 15.87 | 44.90 | 12.91 | 14.48 |
| Lane Group LOS | C | C | D | D | D | D | C | B | D | B | B |
| Critical Lane Group | No | No | Yes | Yes | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 1.73 | 1.75 | 5.39 | 0.66 | 0.61 | 0.67 | 11.16 | 3.94 | 5.20 | 7.66 | 8.52 |
| 50th-Percentile Queue Length [ft/ln] | 43.33 | 43.75 | 134.70 | 16.60 | 15.31 | 16.68 | 279.03 | 98.40 | 129.98 | 191.46 | 213.04 |
| 95th-Percentile Queue Length [veh/ln] | 3.12 | 3.15 | 9.19 | 1.19 | 1.10 | 1.20 | 16.64 | 7.08 | 8.94 | 12.20 | 13.31 |
| 95th-Percentile Queue Length [ft/ln] | 77.99 | 78.74 | 229.87 | 29.87 | 27.56 | 30.02 | 416.00 | 177.12 | 223.47 | 304.92 | 332.73 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 34.81 | 34.83 | 42.56 | 43.12 | 42.65 | 42.65 | 47.57 | 21.29 | 15.87 | 44.90 | 13.42 | 14.48 |
| Movement LOS | C | C | D | D | D | D | D | C | B | D | B | B |
| d_A, Approach Delay [s/veh] | 39.26 | | | 42.89 | | | 20.89 | | | 16.63 | | |
| Approach LOS | D | | | D | | | C | | | B | | |
| d_I, Intersection Delay [s/veh] | 20.79 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.750 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.72 | 34.72 | 0.00 | 34.72 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.361 | 1.989 | 0.000 | 3.216 |
| Crosswalk LOS | B | A | F | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 488 | 133 | 622 | 888 |
| d_b, Bicycle Delay [s] | 25.73 | 39.24 | 21.40 | 13.92 |
| l_b,int, Bicycle LOS Score for Intersection | 2.238 | 1.652 | 2.850 | 2.761 |
| Bicycle LOS | B | A | C | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



*APPENDIX D-II*

# YEAR 2026 TRAFFIC CONDITIONS

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 HCM Network.vistro
Report File: N:\...\AM 2026.pdf

Scenario 4 AM 2026
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | HCM 6th Edition | NB Thru | 0.841 | 37.5 | D |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | HCM 6th Edition | WB Left | 0.887 | 29.0 | C |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | HCM 6th Edition | NB Left | 0.901 | 27.0 | C |
| 4 | Randolph Avenue at Birch Street | Signalized | HCM 6th Edition | WB Left | 0.397 | 14.1 | B |
| 5 | State College Boulevard at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.691 | 40.6 | D |
| 6 | S Associated Road at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.813 | 28.3 | C |
| 7 | Randolph Avenue at Madison Way | Signalized | HCM 6th Edition | SB Left | 0.150 | 17.0 | B |
| 8 | Randolph Avenue at Brea Mall | Signalized | HCM 6th Edition | EB Left | 0.115 | 8.0 | A |
| 9 | Brea Mall South at State College Boulevard | Signalized | HCM 6th Edition | WB Left | 0.232 | 15.4 | B |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | HCM 6th Edition | NB Left | 0.926 | 45.1 | D |
| 11 | Puente Street at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.589 | 20.2 | C |
| 12 | Brea Boulevard at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.968 | 46.8 | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.574 | 14.4 | B |
| 14 | State College Boulevard at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.851 | 34.8 | C |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.669 | 16.1 | B |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | HCM 6th Edition | EB Left | 0.687 | 22.4 | C |
| 17 | Associated Road at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.805 | 32.5 | C |
| 18 | Castlegate Lane/Placentia | Signalized | HCM 6th | EB Left | 0.719 | 19.1 | B |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | Edition | EB Left | 0.719 | 19.1 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 37.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.841 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 173 | 222 | 206 | 926 | 617 | 8 | 15 | 1400 | 212 | 479 | 1794 | 576 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 173 | 222 | 206 | 926 | 617 | 8 | 15 | 1400 | 212 | 479 | 1794 | 576 |
| Peak Hour Factor | 0.9130 | 0.9130 | 0.9130 | 0.9700 | 0.9700 | 0.9700 | 0.9540 | 0.9540 | 0.9540 | 0.9540 | 0.9540 | 0.9540 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 47 | 61 | 56 | 239 | 159 | 2 | 4 | 367 | 56 | 126 | 470 | 151 |
| Total Analysis Volume [veh/h] | 189 | 243 | 226 | 955 | 636 | 8 | 16 | 1468 | 222 | 502 | 1881 | 604 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 12 | 13 | 0 | 43 | 44 | 0 | 10 | 40 | 0 | 24 | 54 | 54 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 28 | 0 | 0 | 22 | 22 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 8 | 12 | 12 | 12 | 36 | 40 | 40 | 3 | 37 | 37 | 19 | 54 | 94 |
| g / C, Green / Cycle | 0.07 | 0.10 | 0.10 | 0.10 | 0.30 | 0.33 | 0.33 | 0.02 | 0.31 | 0.31 | 0.16 | 0.45 | 0.78 |
| (v / s)_i Volume / Saturation Flow Rate | 0.05 | 0.09 | 0.08 | 0.08 | 0.27 | 0.17 | 0.17 | 0.00 | 0.22 | 0.22 | 0.14 | 0.33 | 0.32 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1900 | 3500 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 236 | 186 | 186 | 186 | 1058 | 632 | 632 | 76 | 1750 | 583 | 559 | 2537 | 1483 |
| d1, Uniform Delay [s] | 55.20 | 53.61 | 53.21 | 52.90 | 40.20 | 32.20 | 32.18 | 57.73 | 37.04 | 37.14 | 49.49 | 27.59 | 4.24 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 6.24 | 14.81 | 9.48 | 6.99 | 3.19 | 0.64 | 0.64 | 1.37 | 2.62 | 7.82 | 5.49 | 2.00 | 0.83 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.80 | 0.91 | 0.84 | 0.78 | 0.90 | 0.51 | 0.51 | 0.21 | 0.72 | 0.73 | 0.90 | 0.74 | 0.41 |
| d, Delay for Lane Group [s/veh] | 61.44 | 68.41 | 62.69 | 59.89 | 43.39 | 32.84 | 32.82 | 59.10 | 39.66 | 44.96 | 54.99 | 29.59 | 5.07 |
| Lane Group LOS | E | E | E | E | D | C | C | E | D | D | D | C | A |
| Critical Lane Group | No | Yes | No | No | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 3.02 | 5.78 | 5.10 | 4.64 | 13.86 | 7.63 | 7.61 | 0.25 | 11.37 | 12.35 | 7.79 | 15.07 | 4.25 |
| 50th-Percentile Queue Length [ft/ln] | 75.59 | 144.6 | 127.3 | 115.9 | 346.38 | 190.75 | 190.16 | 6.34 | 284.25 | 308.75 | 194.83 | 376.63 | 106.26 |
| 95th-Percentile Queue Length [veh/ln] | 5.44 | 9.73 | 8.80 | 8.17 | 19.96 | 12.16 | 12.13 | 0.46 | 16.90 | 18.11 | 12.37 | 21.43 | 7.63 |
| 95th-Percentile Queue Length [ft/ln] | 136.0 | 243.2 | 219.9 | 204.3 | 498.99 | 304.00 | 303.23 | 11.41 | 422.50 | 452.84 | 309.29 | 535.77 | 190.78 |

**Movement, Approach, & Intersection Results**

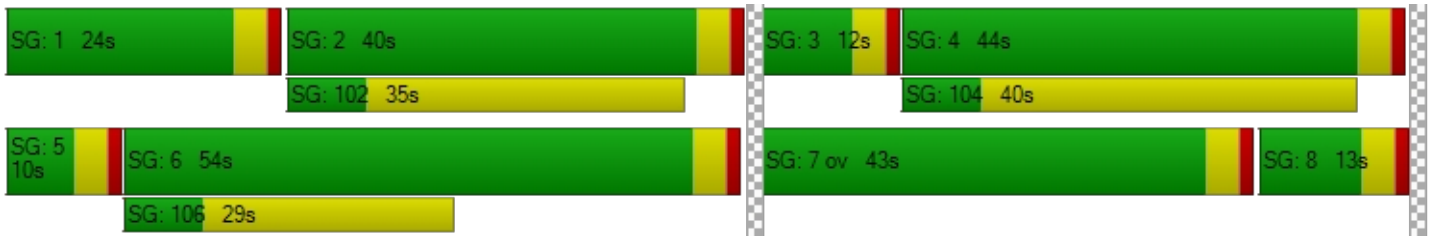
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 61.44 | 66.65 | 60.80 | 43.39 | 32.83 | 32.82 | 59.10 | 40.40 | 44.96 | 54.99 | 29.59 | 5.07 |
| Movement LOS | E | E | E | D | C | C | E | D | D | D | C | A |
| d_A, Approach Delay [s/veh] | 63.18 | | | 39.14 | | | 41.17 | | | 28.90 | | |
| Approach LOS | E | | | D | | | D | | | C | | |
| d_I, Intersection Delay [s/veh] | 37.51 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.841 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.889 | 2.867 | 3.273 | 0.000 |
| Crosswalk LOS | C | C | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 150 | 666 | 600 | 833 |
| d_b, Bicycle Delay [s] | 51.35 | 26.68 | 29.41 | 20.43 |
| l_b,int, Bicycle LOS Score for Intersection | 2.102 | 2.879 | 2.263 | 3.202 |
| Bicycle LOS | B | C | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 29.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.887 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 1071 | 0 | 708 | 0 | 1902 | 635 | 246 | 2202 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 1071 | 0 | 708 | 0 | 1902 | 635 | 246 | 2202 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 0.8640 | 1.0000 | 0.8640 | 1.0000 | 0.9400 | 0.9400 | 0.9190 | 0.9190 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 310 | 0 | 205 | 0 | 506 | 169 | 67 | 599 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 1240 | 0 | 819 | 0 | 2023 | 676 | 268 | 2396 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 105 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 42 | 0 | 13 | 55 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 20 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | No | No | |
| Maximum Recall | | | | No | | | | No | | No | No | |
| Pedestrian Recall | | | | No | | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | R | C | R | L | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 105 | 105 | 105 | 105 | 105 | 105 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 42 | 42 | 42 | 42 | 9 | 55 |
| g / C, Green / Cycle | | 0.40 | 0.40 | 0.40 | 0.40 | 0.09 | 0.52 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.35 | 0.22 | 0.35 | 0.18 | 0.08 | 0.42 |
| s, saturation flow rate [veh/h] | | 3500 | 3800 | 5700 | 3800 | 3500 | 5700 |
| c, Capacity [veh/h] | | 1396 | 1516 | 2282 | 1521 | 303 | 2992 |
| d1, Uniform Delay [s] | | 29.37 | 24.18 | 29.27 | 22.97 | 47.44 | 20.44 |
| k, delay calibration | | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 2.12 | 0.30 | 5.57 | 0.94 | 8.50 | 2.36 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.89 | 0.54 | 0.89 | 0.44 | 0.89 | 0.80 |
| d, Delay for Lane Group [s/veh] | | 31.49 | 24.48 | 34.83 | 23.91 | 55.94 | 22.80 |
| Lane Group LOS | | C | C | C | C | E | C |
| Critical Lane Group | | Yes | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | | 14.47 | 7.71 | 16.43 | 6.20 | 3.81 | 15.77 |
| 50th-Percentile Queue Length [ft/ln] | | 361.82 | 192.70 | 410.85 | 155.01 | 95.17 | 394.35 |
| 95th-Percentile Queue Length [veh/ln] | | 20.71 | 12.26 | 23.08 | 10.28 | 6.85 | 22.29 |
| 95th-Percentile Queue Length [ft/ln] | | 517.80 | 306.53 | 577.06 | 257.11 | 171.31 | 557.18 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 31.49 | 0.00 | 24.48 | 0.00 | 34.83 | 23.91 | 55.94 | 22.80 | 0.00 |
| Movement LOS | | | | C | | C | | C | C | E | C | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 28.70 | | | 32.10 | | | 26.14 | | |
| Approach LOS | A | | | C | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 29.02 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.887 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 42.07 | 42.07 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.182 | 2.640 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 876 | 724 | 971 |
| d_b, Bicycle Delay [s] | 52.50 | 16.57 | 21.37 | 13.88 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 1.560 | 3.044 | 3.025 |
| Bicycle LOS | D | A | C | C |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 27.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.901 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | | | | No | | | No | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1080 | 0 | 512 | 0 | 0 | 0 | 0 | 2555 | 408 | 0 | 1380 | 498 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1080 | 0 | 512 | 0 | 0 | 0 | 0 | 2555 | 408 | 0 | 1380 | 498 |
| Peak Hour Factor | 0.8940 | 1.0000 | 0.8940 | 1.0000 | 1.0000 | 1.0000 | 0.9710 | 0.9710 | 0.9710 | 1.0000 | 0.8830 | 0.8830 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 302 | 0 | 143 | 0 | 0 | 0 | 0 | 658 | 105 | 0 | 391 | 0 |
| Total Analysis Volume [veh/h] | 1208 | 0 | 573 | 0 | 0 | 0 | 0 | 2631 | 420 | 0 | 1563 | 0 |
| Presence of On-Street Parking | No | | No | | | | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 115 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 79 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 36 | 0 |
| Vehicle Extension [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | No | | | | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | | | | | | | No | | | No | |
| Maximum Recall | No | | | | | | | No | | | No | |
| Pedestrian Recall | No | | | | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | R | | C | C | R | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 115 | 115 | | 115 | 115 | 115 | 115 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 46 | 46 | | 61 | 61 | 61 | 61 |
| g / C, Green / Cycle | 0.40 | 0.40 | | 0.53 | 0.53 | 0.53 | 0.53 |
| (v / s)_i Volume / Saturation Flow Rate | 0.35 | 0.30 | | 0.46 | 0.46 | 0.22 | 0.27 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | | 3800 | 1900 | 1900 | 5700 |
| c, Capacity [veh/h] | 1390 | 755 | | 2026 | 1013 | 1013 | 3039 |
| d1, Uniform Delay [s] | 31.86 | 29.87 | | 23.24 | 23.24 | 16.06 | 17.24 |
| k, delay calibration | 0.11 | 0.11 | | 0.50 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.80 | 1.60 | | 5.27 | 9.85 | 1.25 | 0.63 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.87 | 0.76 | | 0.87 | 0.87 | 0.41 | 0.51 |
| d, Delay for Lane Group [s/veh] | 33.66 | 31.47 | | 28.51 | 33.09 | 17.31 | 17.86 |
| Lane Group LOS | C | C | | C | C | B | B |
| Critical Lane Group | Yes | No | | Yes | No | No | No |
| 50th-Percentile Queue Length [veh/ln] | 15.42 | 13.74 | | 21.08 | 22.37 | 6.84 | 8.81 |
| 50th-Percentile Queue Length [ft/ln] | 385.52 | 343.59 | | 526.96 | 559.19 | 170.98 | 220.30 |
| 95th-Percentile Queue Length [veh/ln] | 21.86 | 19.82 | | 28.61 | 30.12 | 11.13 | 13.68 |
| 95th-Percentile Queue Length [ft/ln] | 546.53 | 495.59 | | 715.19 | 753.10 | 278.20 | 342.00 |

**Movement, Approach, & Intersection Results**

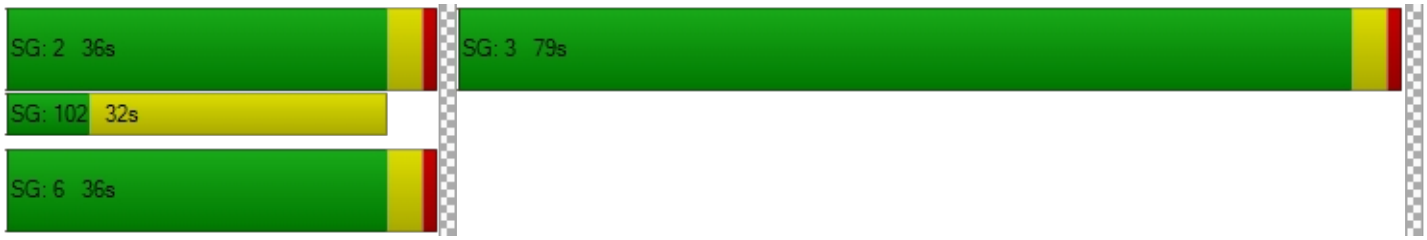
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 33.66 | 0.00 | 31.47 | 0.00 | 0.00 | 0.00 | 0.00 | 29.55 | 17.31 | 0.00 | 17.86 | 0.00 |
| Movement LOS | C | | C | | | | | C | B | | B | |
| d_A, Approach Delay [s/veh] | 32.96 | | | 0.00 | | | 28.28 | | | 17.86 | | |
| Approach LOS | C | | | A | | | C | | | B | | |
| d_I, Intersection Delay [s/veh] | 27.04 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.901 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 0.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 46.98 | 0.00 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.741 | 0.000 | 0.000 | 0.000 |
| Crosswalk LOS | B | F | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1305 | 0 | 557 | 557 |
| d_b, Bicycle Delay [s] | 6.93 | 57.45 | 29.91 | 29.91 |
| l_b,int, Bicycle LOS Score for Intersection | 1.560 | 4.132 | 3.238 | 2.419 |
| Bicycle LOS | A | D | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 14.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.397 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 25 | 42 | 93 | 38 | 36 | 26 | 41 | 622 | 94 | 80 | 566 | 45 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 25 | 42 | 93 | 38 | 36 | 26 | 41 | 622 | 94 | 80 | 566 | 45 |
| Peak Hour Factor | 0.8140 | 0.8140 | 0.8140 | 0.7190 | 0.7190 | 0.7190 | 0.8220 | 0.8220 | 0.8220 | 0.8940 | 0.8940 | 0.8940 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 8 | 13 | 29 | 13 | 13 | 9 | 12 | 189 | 29 | 22 | 158 | 13 |
| Total Analysis Volume [veh/h] | 31 | 52 | 114 | 53 | 50 | 36 | 50 | 757 | 114 | 89 | 633 | 50 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 38 | 0 | 0 | 38 | 0 | 11 | 30 | 0 | 22 | 41 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 25 | 0 | 0 | 19 | 0 | 0 | 18 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 8 | 8 | 8 | 8 | 8 | 4 | 65 | 65 | 6 | 66 | 66 |
| g / C, Green / Cycle | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.05 | 0.72 | 0.72 | 0.06 | 0.73 | 0.73 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.03 | 0.06 | 0.03 | 0.05 | 0.03 | 0.23 | 0.22 | 0.05 | 0.17 | 0.03 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 122 | 163 | 163 | 154 | 163 | 88 | 1360 | 1360 | 117 | 2783 | 1392 |
| d1, Uniform Delay [s] | 38.31 | 38.71 | 40.05 | 38.79 | 39.44 | 41.91 | 4.74 | 4.68 | 41.39 | 3.87 | 3.31 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.07 | 1.12 | 5.41 | 1.33 | 2.66 | 5.70 | 0.64 | 0.60 | 9.55 | 0.19 | 0.05 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.25 | 0.32 | 0.70 | 0.35 | 0.53 | 0.57 | 0.33 | 0.31 | 0.76 | 0.23 | 0.04 |
| d, Delay for Lane Group [s/veh] | 39.39 | 39.83 | 45.46 | 40.12 | 42.09 | 47.61 | 5.39 | 5.28 | 50.94 | 4.06 | 3.36 |
| Lane Group LOS | D | D | D | D | D | D | A | A | D | A | A |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.67 | 1.12 | 2.67 | 1.15 | 1.92 | 1.21 | 2.69 | 2.53 | 2.23 | 1.51 | 0.21 |
| 50th-Percentile Queue Length [ft/ln] | 16.68 | 27.99 | 66.72 | 28.71 | 48.02 | 30.37 | 67.16 | 63.22 | 55.77 | 37.76 | 5.32 |
| 95th-Percentile Queue Length [veh/ln] | 1.20 | 2.02 | 4.80 | 2.07 | 3.46 | 2.19 | 4.84 | 4.55 | 4.02 | 2.72 | 0.38 |
| 95th-Percentile Queue Length [ft/ln] | 30.02 | 50.38 | 120.09 | 51.68 | 86.44 | 54.67 | 120.89 | 113.79 | 100.39 | 67.96 | 9.58 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 39.39 | 39.83 | 45.46 | 40.12 | 42.09 | 42.09 | 47.61 | 5.34 | 5.28 | 50.94 | 4.06 | 3.36 |
| Movement LOS | D | D | D | D | D | D | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 43.02 | | | 41.34 | | | 7.63 | | | 9.42 | | |
| Approach LOS | D | | | D | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 14.06 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.397 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.240 | 2.034 | 2.660 | 2.803 |
| Crosswalk LOS | B | B | B | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 755 | 755 | 578 | 822 |
| d_b, Bicycle Delay [s] | 17.43 | 17.43 | 22.77 | 15.62 |
| l_b,int, Bicycle LOS Score for Intersection | 1.885 | 1.789 | 2.319 | 2.197 |
| Bicycle LOS | A | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 40.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.691 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 80 | 151 | 100 | 696 | 864 | 232 | 115 | 543 | 50 | 81 | 596 | 304 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 80 | 151 | 100 | 696 | 864 | 232 | 115 | 543 | 50 | 81 | 596 | 304 |
| Peak Hour Factor | 0.8430 | 0.8430 | 0.8430 | 0.8910 | 0.8910 | 0.8910 | 0.8600 | 0.8600 | 0.8600 | 0.7640 | 0.7640 | 0.7640 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 24 | 45 | 30 | 195 | 242 | 65 | 33 | 158 | 15 | 27 | 195 | 99 |
| Total Analysis Volume [veh/h] | 95 | 179 | 119 | 781 | 970 | 260 | 134 | 631 | 58 | 106 | 780 | 398 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 26 | 39 | 0 | 32 | 45 | 0 | 10 | 39 | 0 | 10 | 39 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 20 | 20 | 28 | 42 | 42 | 6 | 50 | 50 | 6 | 50 | 50 |
| g / C, Green / Cycle | 0.05 | 0.17 | 0.17 | 0.23 | 0.35 | 0.35 | 0.05 | 0.42 | 0.42 | 0.05 | 0.41 | 0.41 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.05 | 0.06 | 0.22 | 0.32 | 0.32 | 0.04 | 0.17 | 0.03 | 0.03 | 0.21 | 0.21 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 3500 | 1900 | 1900 | 3500 | 3800 | 1900 | 3500 | 3800 | 1900 |
| c, Capacity [veh/h] | 170 | 643 | 322 | 816 | 672 | 672 | 178 | 1576 | 788 | 173 | 1571 | 786 |
| d1, Uniform Delay [s] | 55.84 | 43.48 | 44.20 | 45.43 | 37.06 | 37.06 | 56.25 | 24.65 | 21.20 | 55.95 | 25.99 | 26.13 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.23 | 0.23 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 2.84 | 0.23 | 0.71 | 7.56 | 10.46 | 10.46 | 6.36 | 0.76 | 0.18 | 3.51 | 1.12 | 2.33 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.56 | 0.28 | 0.37 | 0.96 | 0.91 | 0.91 | 0.75 | 0.40 | 0.07 | 0.61 | 0.50 | 0.51 |
| d, Delay for Lane Group [s/veh] | 58.68 | 43.71 | 44.90 | 52.99 | 47.52 | 47.52 | 62.60 | 25.41 | 21.38 | 59.46 | 27.11 | 28.46 |
| Lane Group LOS | E | D | D | D | D | D | E | C | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | 1.48 | 2.35 | 3.22 | 12.26 | 18.92 | 18.92 | 2.16 | 6.45 | 1.03 | 1.66 | 8.42 | 8.89 |
| 50th-Percentile Queue Length [ft/ln] | 36.89 | 58.82 | 80.38 | 306.44 | 473.02 | 473.02 | 54.04 | 161.17 | 25.82 | 41.49 | 210.39 | 222.26 |
| 95th-Percentile Queue Length [veh/ln] | 2.66 | 4.23 | 5.79 | 18.00 | 26.05 | 26.05 | 3.89 | 10.61 | 1.86 | 2.99 | 13.17 | 13.78 |
| 95th-Percentile Queue Length [ft/ln] | 66.40 | 105.87 | 144.68 | 449.98 | 651.37 | 651.37 | 97.28 | 265.27 | 46.48 | 74.69 | 329.33 | 344.51 |

**Movement, Approach, & Intersection Results**

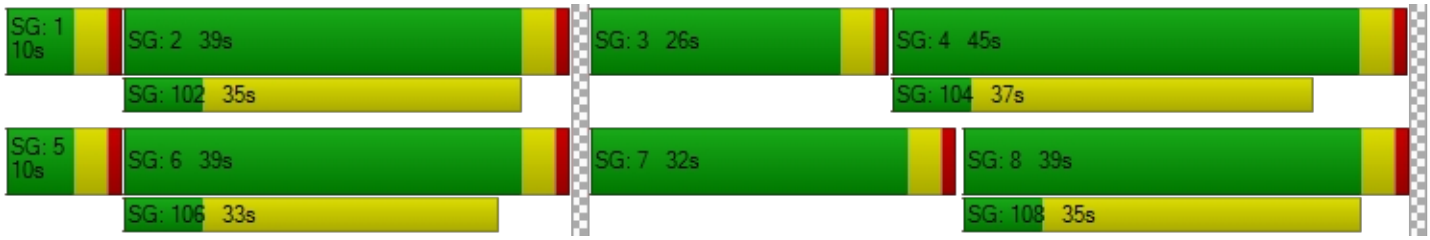
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 58.68 | 43.71 | 44.90 | 52.99 | 47.52 | 47.52 | 62.60 | 25.41 | 21.38 | 59.46 | 27.11 | 28.46 |
| Movement LOS | E | D | D | D | D | D | E | C | C | E | C | C |
| d_A, Approach Delay [s/veh] | 47.69 | | | 49.64 | | | 31.18 | | | 30.20 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 40.57 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.691 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 49.52 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.820 | 2.909 | 2.880 | 3.000 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 583 | 683 | 583 | 583 |
| d_b, Bicycle Delay [s] | 30.12 | 26.02 | 30.12 | 30.12 |
| l_b,int, Bicycle LOS Score for Intersection | 1.884 | 3.219 | 2.239 | 2.619 |
| Bicycle LOS | A | C | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 28.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.813 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 255 | 6 | 323 | 57 | 29 | 9 | 5 | 986 | 335 | 357 | 803 | 11 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 255 | 6 | 323 | 57 | 29 | 9 | 5 | 986 | 335 | 357 | 803 | 11 |
| Peak Hour Factor | 0.8160 | 0.8160 | 0.8160 | 0.7410 | 0.7410 | 0.7410 | 0.8560 | 0.8560 | 0.8560 | 0.9140 | 0.9140 | 0.9140 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 78 | 2 | 99 | 19 | 10 | 3 | 1 | 288 | 98 | 98 | 220 | 3 |
| Total Analysis Volume [veh/h] | 313 | 7 | 396 | 77 | 39 | 12 | 6 | 1152 | 391 | 391 | 879 | 12 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 6 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 30 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 24 | 61 | 61 | 0 | 37 | 0 | 10 | 38 | 0 | 21 | 49 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 7 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 26 | 0 | 26 | 0 | 0 | 27 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | No | | No | | No | No | | No | No | |
| Maximum Recall | No | No | No | | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | No | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 13 | 24 | 45 | 7 | 7 | 1 | 67 | 67 | 17 | 83 | 83 |
| g / C, Green / Cycle | 0.11 | 0.20 | 0.38 | 0.06 | 0.06 | 0.01 | 0.56 | 0.56 | 0.14 | 0.69 | 0.69 |
| (v / s)_i Volume / Saturation Flow Rate | 0.09 | 0.00 | 0.21 | 0.04 | 0.03 | 0.00 | 0.42 | 0.39 | 0.11 | 0.23 | 0.23 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 |
| c, Capacity [veh/h] | 382 | 385 | 718 | 137 | 114 | 18 | 1055 | 1055 | 497 | 1306 | 1306 |
| d1, Uniform Delay [s] | 52.31 | 38.29 | 29.33 | 55.39 | 54.48 | 59.03 | 20.39 | 19.60 | 49.75 | 7.68 | 7.67 |
| k, delay calibration | 0.11 | 0.11 | 0.33 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.35 | 0.02 | 2.01 | 3.56 | 2.71 | 10.37 | 4.97 | 4.05 | 2.81 | 0.71 | 0.71 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.82 | 0.02 | 0.55 | 0.56 | 0.45 | 0.33 | 0.75 | 0.71 | 0.79 | 0.34 | 0.34 |
| d, Delay for Lane Group [s/veh] | 56.66 | 38.31 | 31.34 | 58.95 | 57.19 | 69.40 | 25.36 | 23.65 | 52.56 | 8.39 | 8.38 |
| Lane Group LOS | E | D | C | E | E | E | C | C | D | A | A |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 4.84 | 0.17 | 9.34 | 2.43 | 1.58 | 0.23 | 17.71 | 15.93 | 5.86 | 4.64 | 4.62 |
| 50th-Percentile Queue Length [ft/ln] | 121.03 | 4.22 | 233.56 | 60.63 | 39.44 | 5.84 | 442.80 | 398.23 | 146.41 | 116.06 | 115.40 |
| 95th-Percentile Queue Length [veh/ln] | 8.45 | 0.30 | 14.36 | 4.37 | 2.84 | 0.42 | 24.61 | 22.47 | 9.83 | 8.18 | 8.14 |
| 95th-Percentile Queue Length [ft/ln] | 211.24 | 7.59 | 358.88 | 109.13 | 70.99 | 10.50 | 615.36 | 561.87 | 245.63 | 204.39 | 203.49 |

**Movement, Approach, & Intersection Results**

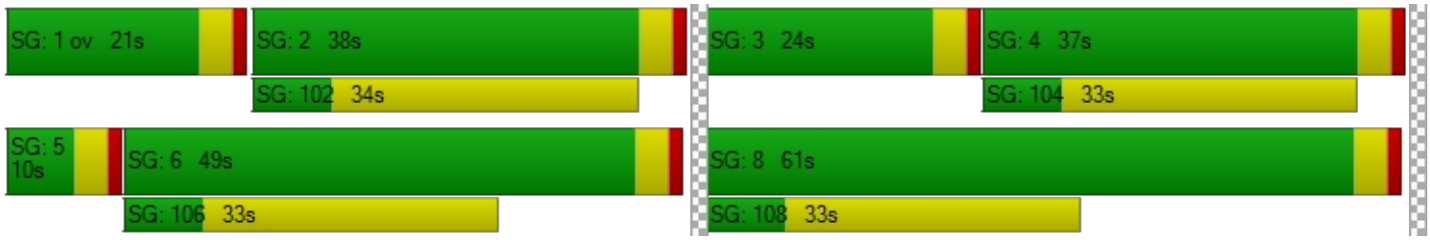
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 56.66 | 38.31 | 31.34 | 58.95 | 57.19 | 57.19 | 69.40 | 24.83 | 23.65 | 52.56 | 8.38 | 8.38 |
| Movement LOS | E | D | C | E | E | E | E | C | C | D | A | A |
| d_A, Approach Delay [s/veh] | 42.48 | | | 58.25 | | | 24.70 | | | 21.86 | | |
| Approach LOS | D | | | E | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 28.34 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.813 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 49.52 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.716 | 2.004 | 2.850 | 3.049 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 950 | 550 | 567 | 750 |
| d_b, Bicycle Delay [s] | 16.55 | 31.55 | 30.83 | 23.45 |
| l_b,int, Bicycle LOS Score for Intersection | 2.741 | 1.771 | 2.838 | 2.617 |
| Bicycle LOS | B | A | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 17.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.150 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 26 | 139 | 8 | 6 | 130 | 17 | 35 | 2 | 59 | 0 | 0 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 26 | 139 | 8 | 6 | 130 | 17 | 35 | 2 | 59 | 0 | 0 | 0 |
| Peak Hour Factor | 0.9010 | 0.9010 | 0.9010 | 0.6500 | 0.6500 | 0.6500 | 0.5970 | 0.5970 | 0.5970 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 39 | 2 | 2 | 50 | 7 | 15 | 1 | 25 | 0 | 0 | 0 |
| Total Analysis Volume [veh/h] | 29 | 154 | 9 | 9 | 200 | 26 | 59 | 3 | 99 | 0 | 0 | 0 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 26 | 0 | 10 | 26 | 0 | 0 | 54 | 0 | 0 | 54 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 12 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | L | C | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 3 | 70 | 70 | 1 | 68 | 68 | 7 | 7 | 7 | 7 |
| g / C, Green / Cycle | 0.04 | 0.78 | 0.78 | 0.01 | 0.75 | 0.75 | 0.08 | 0.08 | 0.08 | 0.08 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.04 | 0.04 | 0.01 | 0.06 | 0.06 | 0.03 | 0.05 | 0.00 | 0.00 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 64 | 1471 | 1471 | 26 | 1431 | 1431 | 185 | 148 | 93 | 148 |
| d1, Uniform Delay [s] | 42.56 | 2.40 | 2.40 | 43.93 | 2.91 | 2.91 | 39.59 | 40.46 | 0.00 | 0.00 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.91 | 0.07 | 0.07 | 7.37 | 0.11 | 0.11 | 0.98 | 5.63 | 0.00 | 0.00 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.45 | 0.06 | 0.06 | 0.34 | 0.08 | 0.08 | 0.32 | 0.69 | 0.00 | 0.00 |
| d, Delay for Lane Group [s/veh] | 47.47 | 2.47 | 2.47 | 51.30 | 3.02 | 3.02 | 40.56 | 46.09 | 0.00 | 0.00 |
| Lane Group LOS | D | A | A | D | A | A | D | D | A | A |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.71 | 0.26 | 0.26 | 0.25 | 0.44 | 0.43 | 1.28 | 2.41 | 0.00 | 0.00 |
| 50th-Percentile Queue Length [ft/ln] | 17.84 | 6.58 | 6.54 | 6.28 | 10.96 | 10.76 | 32.04 | 60.17 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [veh/ln] | 1.28 | 0.47 | 0.47 | 0.45 | 0.79 | 0.77 | 2.31 | 4.33 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln] | 32.12 | 11.85 | 11.76 | 11.30 | 19.73 | 19.37 | 57.68 | 108.31 | 0.00 | 0.00 |

**Movement, Approach, & Intersection Results**

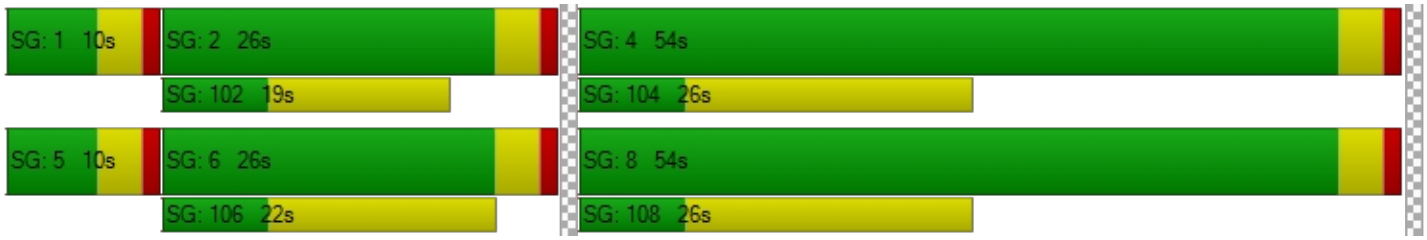
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 47.47 | 2.47 | 2.47 | 51.30 | 3.02 | 3.02 | 40.56 | 46.09 | 46.09 | 0.00 | 0.00 | 0.00 |
| Movement LOS | D | A | A | D | A | A | D | D | D | A | A | A |
| d_A, Approach Delay [s/veh] | 9.27 | | | 4.87 | | | 44.06 | | | 0.00 | | |
| Approach LOS | A | | | A | | | D | | | A | | |
| d_I, Intersection Delay [s/veh] | 17.04 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.150 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.395 | 2.471 | 2.010 | 1.947 |
| Crosswalk LOS | B | B | B | A |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 489 | 489 | 1111 | 1111 |
| d_b, Bicycle Delay [s] | 25.70 | 25.70 | 8.90 | 8.90 |
| l_b,int, Bicycle LOS Score for Intersection | 1.718 | 1.753 | 1.825 | 1.560 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 8.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.115 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 14 | 181 | 69 | 16 | 158 | 6 | 1 | 0 | 1 | 27 | 0 | 5 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 14 | 181 | 69 | 16 | 158 | 6 | 1 | 0 | 1 | 27 | 0 | 5 |
| Peak Hour Factor | 0.8280 | 0.8280 | 0.8280 | 0.9050 | 0.9050 | 0.9050 | 0.2500 | 0.2500 | 0.2500 | 0.6000 | 0.6000 | 0.6000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 55 | 21 | 4 | 44 | 2 | 1 | 0 | 1 | 11 | 0 | 2 |
| Total Analysis Volume [veh/h] | 17 | 219 | 83 | 18 | 175 | 7 | 4 | 0 | 4 | 45 | 0 | 8 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 30 | 0 | 10 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 17 | 0 | 0 | 18 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | C | R | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 0.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 82 | 76 | 76 | 82 | 76 | 76 | 1 | 1 | 5 | 5 |
| g / C, Green / Cycle | 0.82 | 0.76 | 0.76 | 0.82 | 0.76 | 0.76 | 0.01 | 0.01 | 0.05 | 0.05 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.08 | 0.08 | 0.01 | 0.05 | 0.05 | 0.00 | 0.00 | 0.01 | 0.01 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 1554 | 1437 | 1437 | 1536 | 1439 | 1439 | 23 | 24 | 84 | 89 |
| d1, Uniform Delay [s] | 1.62 | 3.23 | 3.22 | 1.62 | 3.09 | 3.09 | 48.89 | 48.89 | 46.14 | 46.10 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.00 | 0.15 | 0.14 | 0.01 | 0.08 | 0.08 | 3.66 | 3.25 | 2.12 | 1.84 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.01 | 0.11 | 0.10 | 0.01 | 0.06 | 0.06 | 0.18 | 0.17 | 0.32 | 0.30 |
|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 1.63 | 3.38 | 3.36 | 1.64 | 3.17 | 3.17 | 52.55 | 52.14 | 48.26 | 47.94 |
| Lane Group LOS | A | A | A | A | A | A | D | D | D | D |
| Critical Lane Group | No | Yes | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.04 | 0.71 | 0.67 | 0.04 | 0.40 | 0.40 | 0.12 | 0.12 | 0.69 | 0.68 |
| 50th-Percentile Queue Length [ft/ln] | 0.92 | 17.79 | 16.79 | 1.09 | 10.02 | 9.97 | 3.04 | 3.00 | 17.18 | 16.93 |
| 95th-Percentile Queue Length [veh/ln] | 0.07 | 1.28 | 1.21 | 0.08 | 0.72 | 0.72 | 0.22 | 0.22 | 1.24 | 1.22 |
| 95th-Percentile Queue Length [ft/ln] | 1.66 | 32.03 | 30.23 | 1.97 | 18.04 | 17.95 | 5.46 | 5.40 | 30.92 | 30.48 |

**Movement, Approach, & Intersection Results**

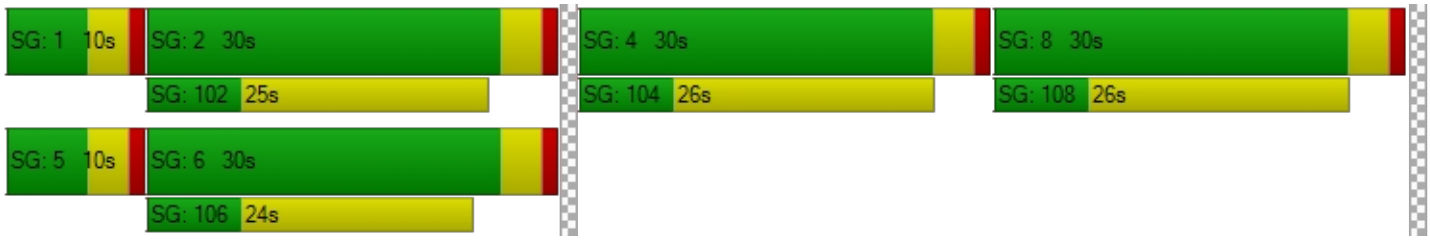
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 1.63 | 3.37 | 3.36 | 1.64 | 3.17 | 3.17 | 52.55 | 52.55 | 52.14 | 48.13 | 47.94 | 47.94 |
| Movement LOS | A | A | A | A | A | A | D | D | D | D | D | D |
| d_A, Approach Delay [s/veh] | 3.28 | | | 3.04 | | | 52.34 | | | 48.10 | | |
| Approach LOS | A | | | A | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 7.97 | | | | | | | | | | | |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.115 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 39.62 | 39.62 | 39.62 | 39.62 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.411 | 2.389 | 1.974 | 2.015 |
| Crosswalk LOS | B | B | A | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 520 | 520 | 520 | 520 |
| d_b, Bicycle Delay [s] | 27.40 | 27.40 | 27.40 | 27.40 |
| l_b,int, Bicycle LOS Score for Intersection | 1.823 | 1.725 | 1.573 | 1.647 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 15.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.232 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 33 | 9 | 16 | 3 | 6 | 28 | 80 | 270 | 16 | 28 | 381 | 12 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 33 | 9 | 16 | 3 | 6 | 28 | 80 | 270 | 16 | 28 | 381 | 12 |
| Peak Hour Factor | 0.5830 | 0.5830 | 0.5830 | 0.5500 | 0.5500 | 0.5500 | 0.8240 | 0.8240 | 0.8240 | 0.9420 | 0.9420 | 0.9420 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 14 | 4 | 7 | 1 | 3 | 13 | 24 | 82 | 5 | 7 | 101 | 3 |
| Total Analysis Volume [veh/h] | 57 | 15 | 27 | 5 | 11 | 51 | 97 | 328 | 19 | 30 | 404 | 13 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 6 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 30 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 37 | 0 | 0 | 10 | 10 | 11 | 33 | 0 | 10 | 32 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 21 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | No | No | No | | No | No | |
| Maximum Recall | | No | | | No | No | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | No | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | C | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 6 | 6 | 5 | 5 | 24 | 6 | 60 | 60 | 3 | 58 | 58 |
| g / C, Green / Cycle | 0.06 | 0.06 | 0.06 | 0.05 | 0.05 | 0.27 | 0.06 | 0.67 | 0.67 | 0.04 | 0.64 | 0.64 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.03 | 0.01 | 0.00 | 0.00 | 0.03 | 0.03 | 0.09 | 0.09 | 0.02 | 0.11 | 0.11 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 1900 | 1900 |
| c, Capacity [veh/h] | 158 | 180 | 118 | 100 | 105 | 510 | 217 | 1270 | 1270 | 66 | 1222 | 1222 |
| d1, Uniform Delay [s] | 40.12 | 40.82 | 40.23 | 40.42 | 40.39 | 24.81 | 40.81 | 5.46 | 5.45 | 42.56 | 6.46 | 6.45 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.38 | 0.85 | 0.97 | 0.36 | 0.29 | 0.08 | 1.45 | 0.23 | 0.22 | 4.84 | 0.30 | 0.30 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.13 | 0.28 | 0.23 | 0.08 | 0.07 | 0.10 | 0.45 | 0.14 | 0.14 | 0.46 | 0.17 | 0.17 |
| d, Delay for Lane Group [s/veh] | 40.50 | 41.67 | 41.20 | 40.77 | 40.68 | 24.90 | 42.26 | 5.69 | 5.68 | 47.40 | 6.76 | 6.75 |
| Lane Group LOS | D | D | D | D | D | C | D | A | A | D | A | A |
| Critical Lane Group | No | Yes | No | No | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.45 | 1.13 | 0.60 | 0.18 | 0.17 | 0.82 | 1.07 | 1.11 | 1.10 | 0.74 | 1.52 | 1.50 |
| 50th-Percentile Queue Length [ft/ln] | 11.32 | 28.13 | 14.90 | 4.61 | 4.19 | 20.57 | 26.79 | 27.83 | 27.42 | 18.42 | 37.92 | 37.59 |
| 95th-Percentile Queue Length [veh/ln] | 0.82 | 2.03 | 1.07 | 0.33 | 0.30 | 1.48 | 1.93 | 2.00 | 1.97 | 1.33 | 2.73 | 2.71 |
| 95th-Percentile Queue Length [ft/ln] | 20.38 | 50.63 | 26.82 | 8.29 | 7.55 | 37.02 | 48.21 | 50.10 | 49.35 | 33.15 | 68.26 | 67.66 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 41.19 | 41.67 | 41.20 | 40.77 | 40.71 | 24.90 | 42.26 | 5.68 | 5.68 | 47.40 | 6.76 | 6.75 |
| Movement LOS | D | D | D | D | D | C | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 41.29 | | | 28.68 | | | 13.67 | | | 9.48 | | |
| Approach LOS | D | | | C | | | B | | | A | | |
| d_I, Intersection Delay [s/veh] | 15.44 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.232 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.72 | 34.72 | 0.00 | 34.72 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.330 | 2.337 | 0.000 | 2.457 |
| Crosswalk LOS | B | B | F | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 733 | 133 | 644 | 622 |
| d_b, Bicycle Delay [s] | 18.09 | 39.24 | 20.71 | 21.40 |
| l_b,int, Bicycle LOS Score for Intersection | 1.723 | 1.615 | 1.926 | 1.928 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 45.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.926 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 314 | 712 | 279 | 170 | 1318 | 318 | 289 | 1395 | 375 | 313 | 1247 | 262 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 314 | 712 | 279 | 170 | 1318 | 318 | 289 | 1395 | 375 | 313 | 1247 | 262 |
| Peak Hour Factor | 0.8230 | 0.8230 | 0.8230 | 0.9630 | 0.9630 | 0.9630 | 0.8630 | 0.8630 | 0.8630 | 0.9800 | 0.9800 | 0.9800 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 95 | 216 | 85 | 44 | 342 | 83 | 84 | 404 | 109 | 80 | 318 | 67 |
| Total Analysis Volume [veh/h] | 382 | 865 | 339 | 177 | 1369 | 330 | 335 | 1616 | 435 | 319 | 1272 | 267 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 18 | 45 | 0 | 12 | 39 | 0 | 18 | 47 | 0 | 16 | 45 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 31 | 0 | 0 | 28 | 0 | 0 | 31 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 14 | 39 | 39 | 8 | 33 | 33 | 13 | 45 | 45 | 12 | 44 | 44 |
| g / C, Green / Cycle | 0.12 | 0.32 | 0.32 | 0.07 | 0.27 | 0.27 | 0.11 | 0.38 | 0.38 | 0.10 | 0.37 | 0.37 |
| (v / s)_i Volume / Saturation Flow Rate | 0.11 | 0.15 | 0.18 | 0.05 | 0.24 | 0.17 | 0.10 | 0.36 | 0.36 | 0.09 | 0.22 | 0.14 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 410 | 1838 | 613 | 234 | 1551 | 517 | 392 | 1432 | 716 | 352 | 2084 | 695 |
| d1, Uniform Delay [s] | 52.53 | 32.49 | 33.54 | 55.06 | 41.85 | 38.48 | 52.36 | 36.52 | 36.19 | 53.44 | 31.11 | 28.12 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.16 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 9.82 | 0.19 | 0.78 | 4.94 | 1.82 | 1.93 | 5.42 | 15.96 | 22.47 | 8.86 | 1.34 | 1.61 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.93 | 0.47 | 0.55 | 0.76 | 0.88 | 0.64 | 0.86 | 0.96 | 0.94 | 0.91 | 0.61 | 0.38 |
| d, Delay for Lane Group [s/veh] | 62.35 | 32.68 | 34.33 | 59.99 | 43.67 | 40.42 | 57.78 | 52.48 | 58.66 | 62.30 | 32.45 | 29.73 |
| Lane Group LOS | E | C | C | E | D | D | E | D | E | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 6.25 | 6.72 | 8.25 | 2.79 | 13.09 | 8.81 | 5.25 | 22.46 | 23.26 | 5.19 | 10.24 | 5.99 |
| 50th-Percentile Queue Length [ft/ln] | 156.35 | 168.03 | 206.33 | 69.82 | 327.21 | 220.18 | 131.18 | 561.39 | 581.59 | 129.79 | 255.92 | 149.74 |
| 95th-Percentile Queue Length [veh/ln] | 10.36 | 10.97 | 12.96 | 5.03 | 19.02 | 13.67 | 9.00 | 30.23 | 31.17 | 8.93 | 15.48 | 10.00 |
| 95th-Percentile Queue Length [ft/ln] | 258.88 | 274.32 | 324.12 | 125.67 | 475.53 | 341.86 | 225.09 | 755.68 | 779.35 | 223.21 | 387.10 | 250.08 |

**Movement, Approach, & Intersection Results**

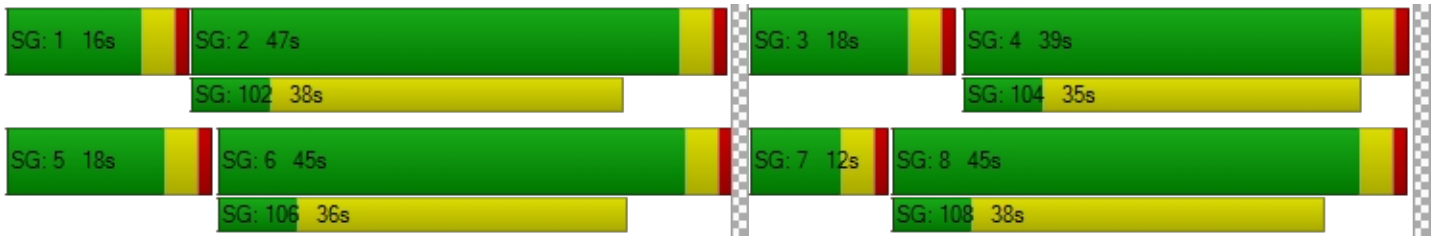
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 62.35 | 32.68 | 34.33 | 59.99 | 43.67 | 40.42 | 57.78 | 53.40 | 58.66 | 62.30 | 32.45 | 29.73 |
| Movement LOS | E | C | C | E | D | D | E | D | E | E | C | C |
| d_A, Approach Delay [s/veh] | 40.18 | | | 44.64 | | | 54.98 | | | 37.18 | | |
| Approach LOS | D | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 45.12 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.926 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 49.52 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.265 | 3.225 | 3.272 | 3.295 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 683 | 583 | 716 | 683 |
| d_b, Bicycle Delay [s] | 26.02 | 30.12 | 24.72 | 26.02 |
| l_b,int, Bicycle LOS Score for Intersection | 2.432 | 2.591 | 2.872 | 2.582 |
| Bicycle LOS | B | B | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 20.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.589 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 61 | 118 | 158 | 136 | 87 | 148 | 234 | 1447 | 81 | 50 | 1479 | 173 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 61 | 118 | 158 | 136 | 87 | 148 | 234 | 1447 | 81 | 50 | 1479 | 173 |
| Peak Hour Factor | 0.8950 | 0.8950 | 0.8950 | 0.8510 | 0.8510 | 0.8510 | 0.8710 | 0.8710 | 0.8710 | 0.9670 | 0.9670 | 0.9670 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 17 | 33 | 44 | 40 | 26 | 43 | 67 | 415 | 23 | 13 | 382 | 45 |
| Total Analysis Volume [veh/h] | 68 | 132 | 177 | 160 | 102 | 174 | 269 | 1661 | 93 | 52 | 1529 | 179 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 39 | 0 | 0 | 39 | 0 | 17 | 31 | 0 | 20 | 34 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 23 | 0 | 0 | 17 | 0 | 0 | 23 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 11 | 11 | 11 | 11 | 11 | 11 | 13 | 63 | 63 | 4 | 54 | 54 |
| g / C, Green / Cycle | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.14 | 0.70 | 0.70 | 0.05 | 0.60 | 0.60 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.07 | 0.09 | 0.09 | 0.03 | 0.09 | 0.15 | 0.31 | 0.31 | 0.03 | 0.27 | 0.09 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 222 | 232 | 232 | 148 | 465 | 232 | 261 | 2640 | 1320 | 89 | 3416 | 1139 |
| d1, Uniform Delay [s] | 36.05 | 37.27 | 38.25 | 37.79 | 35.64 | 38.18 | 38.49 | 6.04 | 6.11 | 41.87 | 9.88 | 7.98 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.78 | 2.18 | 5.11 | 58.82 | 0.24 | 4.79 | 33.84 | 0.53 | 1.11 | 5.86 | 0.43 | 0.29 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.31 | 0.57 | 0.76 | 1.08 | 0.22 | 0.75 | 1.03 | 0.44 | 0.45 | 0.58 | 0.45 | 0.16 |
| d, Delay for Lane Group [s/veh] | 36.82 | 39.45 | 43.35 | 96.61 | 35.88 | 42.97 | 72.33 | 6.57 | 7.22 | 47.74 | 10.30 | 8.27 |
| Lane Group LOS | D | D | D | F | D | D | F | A | A | D | B | A |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 1.40 | 2.85 | 4.05 | 5.49 | 1.01 | 3.96 | 8.11 | 4.14 | 4.50 | 1.26 | 5.09 | 1.50 |
| 50th-Percentile Queue Length [ft/ln] | 34.89 | 71.15 | 101.30 | 137.18 | 25.37 | 99.05 | 202.71 | 103.46 | 112.56 | 31.61 | 127.36 | 37.51 |
| 95th-Percentile Queue Length [veh/ln] | 2.51 | 5.12 | 7.29 | 9.61 | 1.83 | 7.13 | 12.95 | 7.45 | 7.98 | 2.28 | 8.80 | 2.70 |
| 95th-Percentile Queue Length [ft/ln] | 62.80 | 128.06 | 182.34 | 240.24 | 45.66 | 178.28 | 323.65 | 186.23 | 199.56 | 56.90 | 219.90 | 67.52 |

**Movement, Approach, & Intersection Results**

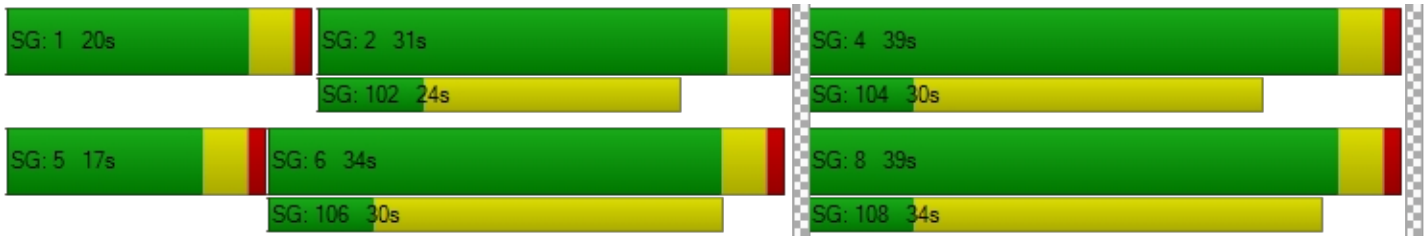
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 36.82 | 39.45 | 43.35 | 96.61 | 35.88 | 42.97 | 72.33 | 6.77 | 7.22 | 47.74 | 10.30 | 8.27 |
| Movement LOS | D | D | D | F | D | D | F | A | A | D | B | A |
| d_A, Approach Delay [s/veh] | 40.81 | | | 60.99 | | | 15.50 | | | 11.20 | | |
| Approach LOS | D | | | E | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 20.25 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.589 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.421 | 2.497 | 3.219 | 3.411 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 778 | 778 | 600 | 666 |
| d_b, Bicycle Delay [s] | 16.82 | 16.82 | 22.06 | 20.01 |
| l_b,int, Bicycle LOS Score for Intersection | 2.182 | 1.919 | 2.672 | 2.528 |
| Bicycle LOS | B | A | B | B |

## Sequence

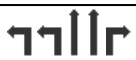
| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 46.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.968 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 450 | 501 | 158 | 172 | 1032 | 209 | 166 | 1604 | 367 | 167 | 1685 | 116 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 450 | 501 | 158 | 172 | 1032 | 209 | 166 | 1604 | 367 | 167 | 1685 | 116 |
| Peak Hour Factor | 0.7960 | 0.7960 | 0.7960 | 0.9500 | 0.9500 | 0.9500 | 0.9210 | 0.9210 | 0.9210 | 0.8690 | 0.8690 | 0.8690 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 141 | 157 | 50 | 45 | 272 | 55 | 45 | 435 | 100 | 48 | 485 | 33 |
| Total Analysis Volume [veh/h] | 565 | 629 | 198 | 181 | 1086 | 220 | 180 | 1742 | 398 | 192 | 1939 | 133 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 24 | 41 | 0 | 22 | 39 | 0 | 11 | 46 | 0 | 11 | 46 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 20 | 47 | 47 | 8 | 35 | 35 | 7 | 42 | 42 | 7 | 42 | 42 |
| g / C, Green / Cycle | 0.17 | 0.39 | 0.39 | 0.07 | 0.29 | 0.29 | 0.06 | 0.35 | 0.35 | 0.06 | 0.35 | 0.35 |
| (v / s)_i Volume / Saturation Flow Rate | 0.16 | 0.11 | 0.10 | 0.05 | 0.29 | 0.12 | 0.05 | 0.31 | 0.21 | 0.05 | 0.34 | 0.07 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 584 | 2208 | 736 | 245 | 1104 | 552 | 205 | 2000 | 667 | 205 | 2000 | 667 |
| d1, Uniform Delay [s] | 49.69 | 25.32 | 25.14 | 54.73 | 42.28 | 34.15 | 56.07 | 36.42 | 31.99 | 56.28 | 38.33 | 27.19 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 11.33 | 0.07 | 0.19 | 4.32 | 9.28 | 0.47 | 11.40 | 5.56 | 3.92 | 17.55 | 14.14 | 0.67 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.97 | 0.28 | 0.27 | 0.74 | 0.98 | 0.40 | 0.88 | 0.87 | 0.60 | 0.94 | 0.97 | 0.20 |
| d, Delay for Lane Group [s/veh] | 61.02 | 25.39 | 25.34 | 59.05 | 51.55 | 34.61 | 67.48 | 41.98 | 35.91 | 73.82 | 52.48 | 27.87 |
| Lane Group LOS | E | C | C | E | D | C | E | D | D | E | D | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 9.30 | 4.14 | 3.91 | 2.83 | 17.20 | 5.23 | 3.03 | 16.72 | 10.18 | 3.39 | 21.00 | 2.81 |
| 50th-Percentile Queue Length [ft/ln] | 232.62 | 103.60 | 97.82 | 70.77 | 429.91 | 130.84 | 75.72 | 418.10 | 254.38 | 84.86 | 525.11 | 70.22 |
| 95th-Percentile Queue Length [veh/ln] | 14.31 | 7.46 | 7.04 | 5.10 | 24.00 | 8.99 | 5.45 | 23.43 | 15.41 | 6.11 | 28.52 | 5.06 |
| 95th-Percentile Queue Length [ft/ln] | 357.68 | 186.47 | 176.07 | 127.38 | 599.93 | 224.63 | 136.29 | 585.77 | 385.16 | 152.74 | 713.01 | 126.39 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 61.02 | 25.39 | 25.34 | 59.05 | 51.55 | 34.61 | 67.48 | 41.98 | 35.91 | 73.82 | 52.48 | 27.87 |
| Movement LOS | E | C | C | E | D | C | E | D | D | E | D | C |
| d_A, Approach Delay [s/veh] | 39.84 | | | 49.96 | | | 42.92 | | | 52.84 | | |
| Approach LOS | D | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 46.76 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.968 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.51 | 49.51 | 49.51 | 49.51 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.113 | 3.035 | 3.409 | 3.338 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 617 | 583 | 700 | 700 |
| d_b, Bicycle Delay [s] | 28.71 | 30.11 | 25.35 | 25.35 |
| l_b,int, Bicycle LOS Score for Intersection | 2.325 | 2.786 | 2.836 | 2.805 |
| Bicycle LOS | B | C | C | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 14.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.574 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 37 | 19 | 68 | 133 | 21 | 32 | 62 | 1683 | 26 | 41 | 1790 | 154 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 37 | 19 | 68 | 133 | 21 | 32 | 62 | 1683 | 26 | 41 | 1790 | 154 |
| Peak Hour Factor | 0.7700 | 0.7700 | 0.7700 | 0.8070 | 0.8070 | 0.8070 | 0.8950 | 0.8950 | 0.8950 | 0.8510 | 0.8510 | 0.8510 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 12 | 6 | 22 | 41 | 7 | 10 | 17 | 470 | 7 | 12 | 526 | 45 |
| Total Analysis Volume [veh/h] | 48 | 25 | 88 | 165 | 26 | 40 | 69 | 1880 | 29 | 48 | 2103 | 181 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 10 | 0 | 0 | 40 | 0 | 10 | 40 | 0 | 10 | 40 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 28 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 7 | 7 | 7 | 7 | 7 | 5 | 65 | 65 | 4 | 65 | 65 |
| g / C, Green / Cycle | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.05 | 0.65 | 0.65 | 0.04 | 0.65 | 0.65 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.01 | 0.05 | 0.05 | 0.03 | 0.02 | 0.33 | 0.34 | 0.03 | 0.37 | 0.10 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 3500 | 1900 | 3500 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 124 | 124 | 131 | 255 | 138 | 183 | 2481 | 1241 | 82 | 3682 | 1227 |
| d1, Uniform Delay [s] | 44.58 | 44.00 | 45.49 | 45.17 | 44.59 | 45.88 | 9.00 | 9.20 | 46.88 | 9.94 | 6.93 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.95 | 0.78 | 5.79 | 2.75 | 2.54 | 1.28 | 0.74 | 1.61 | 6.58 | 0.65 | 0.25 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.39 | 0.20 | 0.67 | 0.65 | 0.48 | 0.38 | 0.51 | 0.53 | 0.59 | 0.57 | 0.15 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 46.53 | 44.78 | 51.28 | 47.92 | 47.13 | 47.16 | 9.74 | 10.81 | 53.47 | 10.59 | 7.19 |
| Lane Group LOS | D | D | D | D | D | D | A | B | D | B | A |
| Critical Lane Group | No | No | Yes | Yes | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 1.20 | 0.61 | 2.33 | 2.08 | 1.66 | 0.86 | 6.55 | 7.27 | 1.32 | 7.91 | 1.47 |
| 50th-Percentile Queue Length [ft/ln] | 30.05 | 15.26 | 58.35 | 52.01 | 41.58 | 21.47 | 163.81 | 181.69 | 32.91 | 197.66 | 36.76 |
| 95th-Percentile Queue Length [veh/ln] | 2.16 | 1.10 | 4.20 | 3.74 | 2.99 | 1.55 | 10.75 | 11.69 | 2.37 | 12.52 | 2.65 |
| 95th-Percentile Queue Length [ft/ln] | 54.08 | 27.46 | 105.02 | 93.61 | 74.85 | 38.65 | 268.77 | 292.22 | 59.24 | 312.94 | 66.17 |

**Movement, Approach, & Intersection Results**

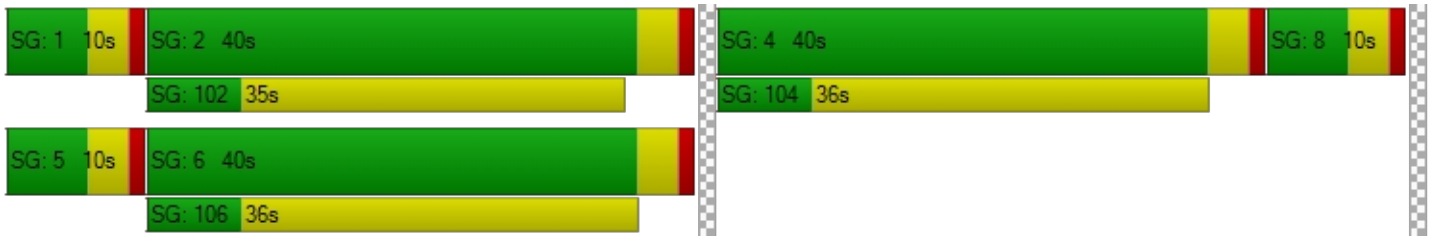
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 46.53 | 44.78 | 51.28 | 47.92 | 47.13 | 47.13 | 47.16 | 10.10 | 10.81 | 53.47 | 10.59 | 7.19 |
| Movement LOS | D | D | D | D | D | D | D | B | B | D | B | A |
| d_A, Approach Delay [s/veh] | 48.85 | | | 47.70 | | | 11.40 | | | 11.21 | | |
| Approach LOS | D | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 14.37 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.574 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 39.64 | 39.64 | 39.64 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.200 | 2.403 | 3.238 | 0.000 |
| Crosswalk LOS | B | B | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 120 | 719 | 719 | 719 |
| d_b, Bicycle Delay [s] | 44.22 | 20.51 | 20.51 | 20.51 |
| l_b,int, Bicycle LOS Score for Intersection | 1.692 | 1.941 | 2.648 | 2.842 |
| Bicycle LOS | A | A | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 34.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.851 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 115 | 160 | 429 | 102 | 392 | 28 | 35 | 1684 | 194 | 462 | 1845 | 146 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 115 | 160 | 429 | 102 | 392 | 28 | 35 | 1684 | 194 | 462 | 1845 | 146 |
| Peak Hour Factor | 0.9050 | 0.9050 | 0.9050 | 0.9420 | 0.9420 | 0.9420 | 0.9090 | 0.9090 | 0.9090 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 32 | 44 | 119 | 27 | 104 | 7 | 10 | 463 | 53 | 128 | 513 | 41 |
| Total Analysis Volume [veh/h] | 127 | 177 | 474 | 108 | 416 | 30 | 39 | 1853 | 213 | 513 | 2050 | 162 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 110 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 13 | 41 | 0 | 11 | 39 | 0 | 11 | 36 | 0 | 22 | 47 | 47 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 23 | 0 | 0 | 23 | 23 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 6 | 30 | 30 | 7 | 31 | 31 | 4 | 39 | 39 | 18 | 53 | 64 |
| g / C, Green / Cycle | 0.05 | 0.27 | 0.27 | 0.06 | 0.28 | 0.28 | 0.04 | 0.36 | 0.36 | 0.16 | 0.48 | 0.58 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.05 | 0.25 | 0.05 | 0.12 | 0.12 | 0.01 | 0.27 | 0.28 | 0.15 | 0.36 | 0.09 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 2000 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 190 | 1032 | 516 | 129 | 535 | 535 | 136 | 2028 | 676 | 570 | 2734 | 1103 |
| d1, Uniform Delay [s] | 51.09 | 30.64 | 38.92 | 50.94 | 32.22 | 32.14 | 51.42 | 31.29 | 31.63 | 45.20 | 23.27 | 10.59 |
| k, delay calibration | 0.11 | 0.11 | 0.27 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.03 | 0.08 | 15.10 | 13.27 | 0.53 | 0.51 | 1.14 | 2.72 | 8.69 | 5.46 | 1.94 | 0.28 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.67 | 0.17 | 0.92 | 0.84 | 0.42 | 0.41 | 0.29 | 0.76 | 0.78 | 0.90 | 0.75 | 0.15 |
| d, Delay for Lane Group [s/veh] | 55.12 | 30.71 | 54.02 | 64.21 | 32.75 | 32.65 | 52.55 | 34.01 | 40.32 | 50.65 | 25.21 | 10.87 |
| Lane Group LOS | E | C | D | E | C | C | D | C | D | D | C | B |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 1.82 | 1.81 | 14.40 | 1.71 | 4.95 | 4.84 | 0.54 | 12.32 | 13.90 | 7.26 | 14.37 | 1.85 |
| 50th-Percentile Queue Length [ft/ln] | 45.55 | 45.23 | 359.93 | 42.65 | 123.66 | 120.96 | 13.61 | 307.89 | 347.57 | 181.46 | 359.32 | 46.16 |
| 95th-Percentile Queue Length [veh/ln] | 3.28 | 3.26 | 20.62 | 3.07 | 8.59 | 8.45 | 0.98 | 18.07 | 20.02 | 11.68 | 20.59 | 3.32 |
| 95th-Percentile Queue Length [ft/ln] | 81.99 | 81.42 | 515.50 | 76.77 | 214.85 | 211.15 | 24.49 | 451.77 | 500.44 | 291.92 | 514.76 | 83.09 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 55.12 | 30.71 | 54.02 | 64.21 | 32.70 | 32.65 | 52.55 | 35.08 | 40.32 | 50.65 | 25.21 | 10.87 |
| Movement LOS | E | C | D | E | C | C | D | D | D | D | C | B |
| d_A, Approach Delay [s/veh] | 48.89 | | | 38.84 | | | 35.94 | | | 29.15 | | |
| Approach LOS | D | | | D | | | D | | | C | | |
| d_I, Intersection Delay [s/veh] | 34.83 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.851 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 44.58 | 44.58 | 44.58 | 44.58 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.871 | 2.614 | 3.326 | 3.479 |
| Crosswalk LOS | C | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 672 | 636 | 582 | 781 |
| d_b, Bicycle Delay [s] | 24.25 | 25.59 | 27.68 | 20.43 |
| l_b,int, Bicycle LOS Score for Intersection | 2.201 | 2.017 | 2.428 | 3.058 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 16.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.669 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 611 | 0 | 512 | 0 | 1539 | 726 | 0 | 1965 | 202 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 611 | 0 | 512 | 0 | 1539 | 726 | 0 | 1965 | 202 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 0.8810 | 1.0000 | 0.8810 | 1.0000 | 0.9270 | 0.9270 | 1.0000 | 0.9400 | 0.9400 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 173 | 0 | 145 | 0 | 415 | 196 | 0 | 523 | 54 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 694 | 0 | 581 | 0 | 1660 | 783 | 0 | 2090 | 215 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_di, Inbound Pedestrian Volume crossing m | | 0 | | | 0 | | | 0 | | | 0 | |
| v_co, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ci, Inbound Pedestrian Volume crossing mi | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ab, Corner Pedestrian Volume [ped/h] | | 0 | | | 0 | | | 0 | | | 0 | |
| Bicycle Volume [bicycles/h] | | 0 | | | 0 | | | 0 | | | 0 | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 8.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 64 | 0 | 0 | 0 | 26 | 0 | 0 | 26 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | | No | |
| Maximum Recall | | | | No | | | | No | | | No | |
| Pedestrian Recall | | | | No | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | C | R | C | C |
|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 26 | 26 | 26 | 56 | 56 |
| g / C, Green / Cycle | | 0.29 | 0.29 | 0.29 | 0.62 | 0.62 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.24 | 0.24 | 0.22 | 0.29 | 0.37 |
| s, saturation flow rate [veh/h] | | 1750 | 1750 | 1900 | 5700 | 5700 |
| c, Capacity [veh/h] | | 509 | 509 | 553 | 3535 | 3535 |
| d1, Uniform Delay [s] | | 29.83 | 29.83 | 29.10 | 9.14 | 10.23 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 3.69 | 3.69 | 2.29 | 0.45 | 0.73 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.84 | 0.84 | 0.77 | 0.47 | 0.59 |
| d, Delay for Lane Group [s/veh] | | 33.52 | 33.52 | 31.39 | 9.59 | 10.97 |
| Lane Group LOS | | C | C | C | A | B |
| Critical Lane Group | | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | | 8.84 | 8.84 | 8.46 | 5.31 | 7.52 |
| 50th-Percentile Queue Length [ft/ln] | | 220.91 | 220.91 | 211.55 | 132.82 | 187.96 |
| 95th-Percentile Queue Length [veh/ln] | | 13.71 | 13.71 | 13.23 | 9.09 | 12.02 |
| 95th-Percentile Queue Length [ft/ln] | | 342.78 | 342.78 | 330.81 | 227.32 | 300.38 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 33.52 | 0.00 | 31.96 | 0.00 | 9.59 | 0.00 | 0.00 | 10.97 | 0.00 |
| Movement LOS | | | | C | | C | | A | | | B | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 32.81 | | | 9.59 | | | 10.97 | | |
| Approach LOS | A | | | C | | | A | | | B | | |
| d_I, Intersection Delay [s/veh] | 16.06 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.669 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 0.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 0.00 | 34.63 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 0.000 | 2.441 | 0.000 | 0.000 |
| Crosswalk LOS | F | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 1335 | 489 | 489 |
| d_b, Bicycle Delay [s] | 44.96 | 4.98 | 25.65 | 25.65 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 3.663 | 2.473 | 2.709 |
| Bicycle LOS | D | D | B | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 22.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.687 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1020 | 31 | 850 | 0 | 0 | 86 | 98 | 1432 | 562 | 0 | 1552 | 14 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1020 | 31 | 850 | 0 | 0 | 86 | 98 | 1432 | 562 | 0 | 1552 | 14 |
| Peak Hour Factor | 0.9080 | 0.9080 | 0.9080 | 1.0000 | 1.0000 | 0.6820 | 0.8790 | 0.8790 | 0.8790 | 1.0000 | 0.8940 | 0.8940 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 281 | 9 | 234 | 0 | 0 | 32 | 28 | 407 | 160 | 0 | 434 | 4 |
| Total Analysis Volume [veh/h] | 1123 | 34 | 936 | 0 | 0 | 126 | 111 | 1629 | 639 | 0 | 1736 | 16 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 0 | 6 | 6 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 48 | 0 | 0 | 0 | 11 | 11 | 42 | 0 | 0 | 31 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | | No | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | | No | No | No | | | No | |
| Maximum Recall | | No | | | | No | No | No | | | No | |
| Pedestrian Recall | | No | | | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 34 | 34 | 34 | 7 | 7 | 48 | 37 | 37 |
| g / C, Green / Cycle | 0.37 | 0.37 | 0.37 | 0.08 | 0.08 | 0.54 | 0.41 | 0.41 |
| (v / s)_i Volume / Saturation Flow Rate | 0.29 | 0.30 | 0.28 | 0.03 | 0.06 | 0.29 | 0.23 | 0.23 |
| s, saturation flow rate [veh/h] | 3500 | 1750 | 1900 | 3800 | 1800 | 5700 | 5700 | 1900 |
| c, Capacity [veh/h] | 1310 | 655 | 711 | 298 | 141 | 3061 | 2360 | 787 |
| d1, Uniform Delay [s] | 24.99 | 25.31 | 24.47 | 39.54 | 40.74 | 13.52 | 20.09 | 20.09 |
| k, delay calibration | 0.11 | 0.18 | 0.14 | 0.11 | 0.11 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.09 | 4.08 | 2.12 | 0.95 | 9.20 | 0.67 | 0.95 | 2.83 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.79 | 0.81 | 0.75 | 0.42 | 0.79 | 0.53 | 0.56 | 0.56 |
| d, Delay for Lane Group [s/veh] | 26.08 | 29.39 | 26.59 | 40.49 | 49.95 | 14.18 | 21.05 | 22.93 |
| Lane Group LOS | C | C | C | D | D | B | C | C |
| Critical Lane Group | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 9.53 | 10.47 | 9.83 | 1.35 | 2.75 | 6.80 | 6.90 | 7.31 |
| 50th-Percentile Queue Length [ft/ln] | 238.23 | 261.86 | 245.69 | 33.84 | 68.68 | 169.95 | 172.51 | 182.78 |
| 95th-Percentile Queue Length [veh/ln] | 14.59 | 15.78 | 14.97 | 2.44 | 4.95 | 11.07 | 11.21 | 11.75 |
| 95th-Percentile Queue Length [ft/ln] | 364.79 | 394.55 | 374.22 | 60.91 | 123.63 | 276.84 | 280.21 | 293.64 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 26.31 | 29.39 | 27.83 | 0.00 | 0.00 | 40.49 | 49.95 | 14.18 | 0.00 | 0.00 | 21.50 | 22.93 |
| Movement LOS | C | C | C | | | D | D | B | | | C | C |
| d_A, Approach Delay [s/veh] | 27.05 | | | 40.49 | | | 16.47 | | | 21.52 | | |
| Approach LOS | C | | | D | | | B | | | C | | |
| d_I, Intersection Delay [s/veh] | 22.42 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.687 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.708 | 2.033 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 978 | 156 | 844 | 600 |
| d_b, Bicycle Delay [s] | 11.76 | 38.28 | 15.03 | 22.06 |
| l_b,int, Bicycle LOS Score for Intersection | 5.013 | 1.560 | 2.517 | 2.282 |
| Bicycle LOS | F | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 32.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.805 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 151 | 211 | 73 | 170 | 335 | 166 | 216 | 1936 | 102 | 93 | 1673 | 102 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 151 | 211 | 73 | 170 | 335 | 166 | 216 | 1936 | 102 | 93 | 1673 | 102 |
| Peak Hour Factor | 0.8870 | 0.8870 | 0.8870 | 0.9320 | 0.9320 | 0.9320 | 0.9120 | 0.9120 | 0.9120 | 0.9620 | 0.9620 | 0.9620 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 43 | 59 | 21 | 46 | 90 | 45 | 59 | 531 | 28 | 24 | 435 | 27 |
| Total Analysis Volume [veh/h] | 170 | 238 | 82 | 182 | 359 | 178 | 237 | 2123 | 112 | 97 | 1739 | 106 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 115 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 11 | 39 | 0 | 12 | 40 | 0 | 22 | 53 | 0 | 11 | 42 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 29 | 0 | 0 | 26 | 0 | 0 | 25 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 7 | 23 | 23 | 8 | 24 | 24 | 17 | 61 | 61 | 7 | 51 | 51 |
| g / C, Green / Cycle | 0.06 | 0.20 | 0.20 | 0.07 | 0.21 | 0.21 | 0.15 | 0.53 | 0.53 | 0.06 | 0.44 | 0.44 |
| (v / s)_i Volume / Saturation Flow Rate | 0.05 | 0.09 | 0.08 | 0.05 | 0.19 | 0.09 | 0.13 | 0.39 | 0.40 | 0.05 | 0.24 | 0.25 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 216 | 388 | 388 | 242 | 402 | 402 | 266 | 2000 | 1000 | 111 | 2509 | 836 |
| d1, Uniform Delay [s] | 53.26 | 39.94 | 39.69 | 52.61 | 44.12 | 39.48 | 48.13 | 21.07 | 21.57 | 53.56 | 23.70 | 24.16 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.17 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 6.30 | 0.75 | 0.66 | 4.71 | 10.33 | 0.77 | 9.96 | 2.46 | 5.51 | 18.45 | 0.85 | 2.88 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.79 | 0.43 | 0.40 | 0.75 | 0.89 | 0.44 | 0.89 | 0.74 | 0.76 | 0.87 | 0.54 | 0.58 |
| d, Delay for Lane Group [s/veh] | 59.56 | 40.68 | 40.35 | 57.32 | 54.45 | 40.25 | 58.09 | 23.53 | 27.08 | 72.01 | 24.55 | 27.04 |
| Lane Group LOS | E | D | D | E | D | D | E | C | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.61 | 4.17 | 3.87 | 2.74 | 11.03 | 4.47 | 7.38 | 15.37 | 17.12 | 3.35 | 9.15 | 10.34 |
| 50th-Percentile Queue Length [ft/ln] | 65.28 | 104.21 | 96.66 | 68.45 | 275.81 | 111.73 | 184.60 | 384.33 | 427.89 | 83.71 | 228.65 | 258.47 |
| 95th-Percentile Queue Length [veh/ln] | 4.70 | 7.50 | 6.96 | 4.93 | 16.48 | 7.94 | 11.84 | 21.80 | 23.90 | 6.03 | 14.11 | 15.61 |
| 95th-Percentile Queue Length [ft/ln] | 117.50 | 187.58 | 173.98 | 123.21 | 411.99 | 198.40 | 296.01 | 545.09 | 597.52 | 150.67 | 352.65 | 390.30 |

**Movement, Approach, & Intersection Results**

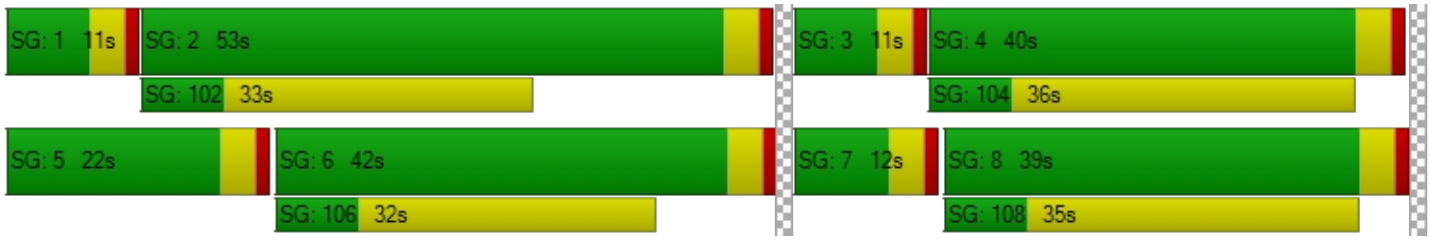
| d_M, Delay for Movement [s/veh] | 59.56 | 40.58 | 40.35 | 57.32 | 54.45 | 40.25 | 58.09 | 24.62 | 27.08 | 72.01 | 25.09 | 27.04 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | E | D | D | E | D | D | E | C | C | E | C | C |
| d_A, Approach Delay [s/veh] | 47.13 | | | 51.66 | | | 27.94 | | | 27.54 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 32.51 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.805 | | | | | | | | | | | |

**Other Modes**

| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
|---|---|---|---|---|
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 47.05 | 47.05 | 47.05 | 47.05 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.518 | 2.676 | 3.293 | 3.265 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 608 | 626 | 852 | 661 |
| d_b, Bicycle Delay [s] | 27.84 | 27.15 | 18.96 | 25.80 |
| l_b,int, Bicycle LOS Score for Intersection | 1.964 | 2.746 | 2.919 | 2.361 |
| Bicycle LOS | A | B | C | B |

## Sequence

| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 19.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.719 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 177 | 12 | 149 | 25 | 28 | 15 | 14 | 1914 | 364 | 178 | 1550 | 33 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 177 | 12 | 149 | 25 | 28 | 15 | 14 | 1914 | 364 | 178 | 1550 | 33 |
| Peak Hour Factor | 0.8320 | 0.8320 | 0.8320 | 0.6740 | 0.6740 | 0.6740 | 0.9510 | 0.9510 | 0.9510 | 0.8930 | 0.8930 | 0.8930 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 53 | 4 | 45 | 9 | 10 | 6 | 4 | 503 | 96 | 50 | 434 | 9 |
| Total Analysis Volume [veh/h] | 213 | 14 | 179 | 37 | 42 | 22 | 15 | 2013 | 383 | 199 | 1736 | 37 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 26 | 0 | 0 | 10 | 0 | 10 | 32 | 0 | 22 | 44 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 14 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 11 | 11 | 11 | 6 | 6 | 2 | 45 | 45 | 12 | 55 | 55 |
| g / C, Green / Cycle | 0.12 | 0.12 | 0.12 | 0.06 | 0.06 | 0.02 | 0.50 | 0.50 | 0.13 | 0.62 | 0.62 |
| (v / s)_i Volume / Saturation Flow Rate | 0.06 | 0.07 | 0.09 | 0.02 | 0.03 | 0.01 | 0.35 | 0.20 | 0.11 | 0.31 | 0.32 |
| s, saturation flow rate [veh/h] | 1750 | 1750 | 1900 | 1800 | 1900 | 1800 | 5700 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 216 | 216 | 235 | 112 | 119 | 40 | 2871 | 957 | 239 | 2335 | 1167 |
| d1, Uniform Delay [s] | 37.04 | 37.05 | 38.25 | 40.47 | 41.02 | 43.47 | 17.17 | 13.91 | 38.11 | 9.67 | 9.85 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.96 | 1.98 | 5.09 | 1.69 | 3.77 | 5.69 | 1.46 | 1.25 | 7.30 | 0.77 | 1.66 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.52 | 0.53 | 0.76 | 0.33 | 0.54 | 0.37 | 0.70 | 0.40 | 0.83 | 0.50 | 0.52 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 39.00 | 39.04 | 43.34 | 42.16 | 44.79 | 49.16 | 18.63 | 15.16 | 45.40 | 10.44 | 11.51 |
| Lane Group LOS | D | D | D | D | D | D | B | B | D | B | B |
| Critical Lane Group | No | No | Yes | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.42 | 2.44 | 4.10 | 0.83 | 1.49 | 0.39 | 10.25 | 4.89 | 4.70 | 5.91 | 6.54 |
| 50th-Percentile Queue Length [ft/ln] | 60.60 | 60.98 | 102.46 | 20.77 | 37.20 | 9.75 | 256.18 | 122.29 | 117.44 | 147.80 | 163.45 |
| 95th-Percentile Queue Length [veh/ln] | 4.36 | 4.39 | 7.38 | 1.50 | 2.68 | 0.70 | 15.50 | 8.52 | 8.25 | 9.90 | 10.73 |
| 95th-Percentile Queue Length [ft/ln] | 109.07 | 109.77 | 184.42 | 37.38 | 66.96 | 17.55 | 387.42 | 212.97 | 206.30 | 247.49 | 268.29 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 39.02 | 39.04 | 43.34 | 42.16 | 44.79 | 44.79 | 49.16 | 18.63 | 15.16 | 45.40 | 10.79 | 11.51 |
| Movement LOS | D | D | D | D | D | D | D | B | B | D | B | B |
| d_A, Approach Delay [s/veh] | 40.92 | | | 43.82 | | | 18.27 | | | 14.30 | | |
| Approach LOS | D | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 19.08 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.719 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.72 | 34.72 | 0.00 | 34.72 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.382 | 1.994 | 0.000 | 3.179 |
| Crosswalk LOS | B | A | F | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 488 | 133 | 622 | 888 |
| d_b, Bicycle Delay [s] | 25.73 | 39.24 | 21.40 | 13.92 |
| l_b,int, Bicycle LOS Score for Intersection | 2.230 | 1.726 | 2.886 | 2.644 |
| Bicycle LOS | B | A | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



Brea Mall Expansion, Brea

Vistro File: N:\...\4099 HCM Network.vistro
Report File: N:\...\PM 2026.pdf

Scenario 5 PM 2026
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | HCM 6th Edition | NB Left | 0.881 | 42.1 | D |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | HCM 6th Edition | WB Left | 0.707 | 19.8 | B |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | HCM 6th Edition | NB Left | 0.660 | 15.0 | B |
| 4 | Randolph Avenue at Birch Street | Signalized | HCM 6th Edition | NB Left | 0.546 | 30.7 | C |
| 5 | State College Boulevard at Birch Street | Signalized | HCM 6th Edition | NB Left | 0.838 | 35.5 | D |
| 6 | S Associated Road at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.703 | 28.2 | C |
| 7 | Randolph Avenue at Madison Way | Signalized | HCM 6th Edition | WB Left | 0.197 | 18.8 | B |
| 8 | Randolph Avenue at Brea Mall | Signalized | HCM 6th Edition | EB Left | 0.355 | 18.4 | B |
| 9 | Brea Mall South at State College Boulevard | Signalized | HCM 6th Edition | WB Left | 0.636 | 30.3 | C |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | HCM 6th Edition | NB Left | 0.922 | 47.2 | D |
| 11 | Puente Street at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.691 | 19.0 | B |
| 12 | Brea Boulevard at Imperial Highway | Signalized | HCM 6th Edition | EB Left | 0.878 | 41.6 | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.763 | 25.8 | C |
| 14 | State College Boulevard at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 1.047 | 62.6 | E |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.754 | 16.9 | B |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | HCM 6th Edition | EB Left | 0.785 | 22.9 | C |
| 17 | Associated Road at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.913 | 46.2 | D |
| 18 | Castlegate Lane/Placentia | Signalized | HCM 6th | EB Left | 0.835 | 26.7 | C |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | Edition | EB Left | 0.855 | 20.7 | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 42.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.881 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 326 | 615 | 319 | 587 | 411 | 16 | 40 | 1506 | 269 | 409 | 1200 | 741 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 326 | 615 | 319 | 587 | 411 | 16 | 40 | 1506 | 269 | 409 | 1200 | 741 |
| Peak Hour Factor | 0.9470 | 0.9470 | 0.9470 | 0.9220 | 0.9220 | 0.9220 | 0.8360 | 0.8360 | 0.8360 | 0.9740 | 0.9740 | 0.9740 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 86 | 162 | 84 | 159 | 111 | 4 | 12 | 450 | 80 | 105 | 308 | 190 |
| Total Analysis Volume [veh/h] | 344 | 649 | 337 | 637 | 446 | 17 | 48 | 1801 | 322 | 420 | 1232 | 761 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 17 | 32 | 0 | 29 | 44 | 0 | 10 | 39 | 0 | 20 | 49 | 49 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 28 | 0 | 0 | 22 | 22 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 13 | 25 | 25 | 25 | 25 | 37 | 37 | 5 | 38 | 38 | 16 | 50 | 79 |
| g / C, Green / Cycle | 0.11 | 0.21 | 0.21 | 0.21 | 0.21 | 0.30 | 0.30 | 0.04 | 0.32 | 0.32 | 0.13 | 0.41 | 0.65 |
| (v / s)_i Volume / Saturation Flow Rate | 0.10 | 0.18 | 0.18 | 0.16 | 0.18 | 0.12 | 0.12 | 0.01 | 0.28 | 0.28 | 0.12 | 0.22 | 0.40 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1900 | 3500 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 381 | 390 | 390 | 390 | 729 | 579 | 579 | 143 | 1821 | 607 | 468 | 2351 | 1243 |
| d1, Uniform Delay [s] | 52.87 | 46.36 | 46.19 | 45.03 | 45.99 | 33.07 | 33.01 | 56.01 | 38.60 | 38.53 | 51.19 | 26.44 | 11.98 |
| k, delay calibration | 0.11 | 0.25 | 0.24 | 0.18 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 8.04 | 14.24 | 12.58 | 5.29 | 3.47 | 0.45 | 0.44 | 1.38 | 6.25 | 15.82 | 6.39 | 0.84 | 2.26 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.90 | 0.89 | 0.87 | 0.77 | 0.87 | 0.40 | 0.40 | 0.34 | 0.88 | 0.87 | 0.90 | 0.52 | 0.61 |
| d, Delay for Lane Group [s/veh] | 60.91 | 60.60 | 58.77 | 50.33 | 49.46 | 33.52 | 33.46 | 57.38 | 44.85 | 54.35 | 57.58 | 27.28 | 14.24 |
| Lane Group LOS | E | E | E | D | D | C | C | E | D | D | E | C | B |
| Critical Lane Group | No | Yes | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 5.54 | 11.53 | 11.15 | 8.99 | 9.51 | 5.46 | 5.38 | 0.74 | 15.66 | 17.18 | 6.62 | 8.93 | 11.74 |
| 50th-Percentile Queue Length [ft/ln] | 138.6 | 288.1 | 278.7 | 224.7 | 237.63 | 136.52 | 134.54 | 18.39 | 391.39 | 429.60 | 165.52 | 223.18 | 293.47 |
| 95th-Percentile Queue Length [veh/ln] | 9.41 | 17.10 | 16.63 | 13.90 | 14.56 | 9.29 | 9.19 | 1.32 | 22.14 | 23.98 | 10.84 | 13.83 | 17.36 |
| 95th-Percentile Queue Length [ft/ln] | 235.1 | 427.3 | 415.6 | 347.6 | 364.04 | 232.33 | 229.66 | 33.11 | 553.62 | 599.57 | 271.02 | 345.69 | 433.94 |

**Movement, Approach, & Intersection Results**

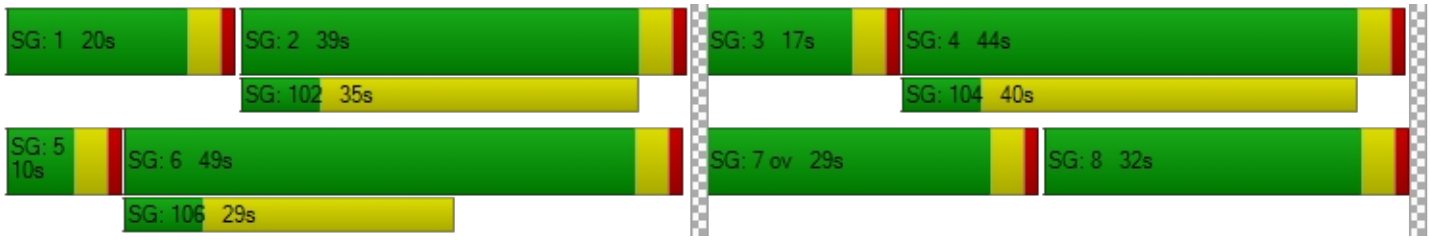
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 60.91 | 59.75 | 50.56 | 49.46 | 33.49 | 33.46 | 57.38 | 45.94 | 54.35 | 57.58 | 27.28 | 14.24 |
| Movement LOS | E | E | D | D | C | C | E | D | D | E | C | B |
| d_A, Approach Delay [s/veh] | 57.90 | | | 42.74 | | | 47.44 | | | 28.44 | | |
| Approach LOS | E | | | D | | | D | | | C | | |
| d_I, Intersection Delay [s/veh] | 42.15 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.881 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.958 | 2.882 | 3.271 | 0.000 |
| Crosswalk LOS | C | C | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 467 | 666 | 583 | 750 |
| d_b, Bicycle Delay [s] | 35.28 | 26.68 | 30.12 | 23.45 |
| l_b,int, Bicycle LOS Score for Intersection | 2.657 | 2.467 | 2.455 | 2.887 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 19.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.707 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 470 | 0 | 870 | 0 | 1477 | 857 | 257 | 1789 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 470 | 0 | 870 | 0 | 1477 | 857 | 257 | 1789 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 0.9480 | 1.0000 | 0.9480 | 1.0000 | 0.8820 | 0.8820 | 0.9530 | 0.9530 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 124 | 0 | 229 | 0 | 419 | 243 | 67 | 469 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 496 | 0 | 918 | 0 | 1675 | 972 | 270 | 1877 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 42 | 0 | 0 | 0 | 35 | 0 | 13 | 48 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 20 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | No | No | |
| Maximum Recall | | | | No | | | | No | | No | No | |
| Pedestrian Recall | | | | No | | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | R | C | R | L | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 27 | 27 | 42 | 42 | 9 | 55 |
| g / C, Green / Cycle | | 0.30 | 0.30 | 0.47 | 0.47 | 0.10 | 0.61 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.14 | 0.24 | 0.29 | 0.26 | 0.08 | 0.33 |
| s, saturation flow rate [veh/h] | | 3500 | 3800 | 5700 | 3800 | 3500 | 5700 |
| c, Capacity [veh/h] | | 1048 | 1137 | 2673 | 1782 | 345 | 3488 |
| d1, Uniform Delay [s] | | 25.75 | 29.15 | 17.98 | 17.06 | 39.65 | 10.11 |
| k, delay calibration | | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 0.33 | 1.41 | 1.12 | 1.20 | 3.93 | 0.60 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.47 | 0.81 | 0.63 | 0.55 | 0.78 | 0.54 |
| d, Delay for Lane Group [s/veh] | | 26.09 | 30.55 | 19.10 | 18.26 | 43.58 | 10.71 |
| Lane Group LOS | | C | C | B | B | D | B |
| Critical Lane Group | | No | Yes | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | | 4.28 | 9.08 | 8.49 | 7.08 | 3.07 | 6.55 |
| 50th-Percentile Queue Length [ft/ln] | | 106.98 | 227.09 | 212.18 | 176.97 | 76.64 | 163.87 |
| 95th-Percentile Queue Length [veh/ln] | | 7.67 | 14.03 | 13.27 | 11.44 | 5.52 | 10.75 |
| 95th-Percentile Queue Length [ft/ln] | | 191.79 | 350.65 | 331.63 | 286.05 | 137.94 | 268.84 |

**Movement, Approach, & Intersection Results**

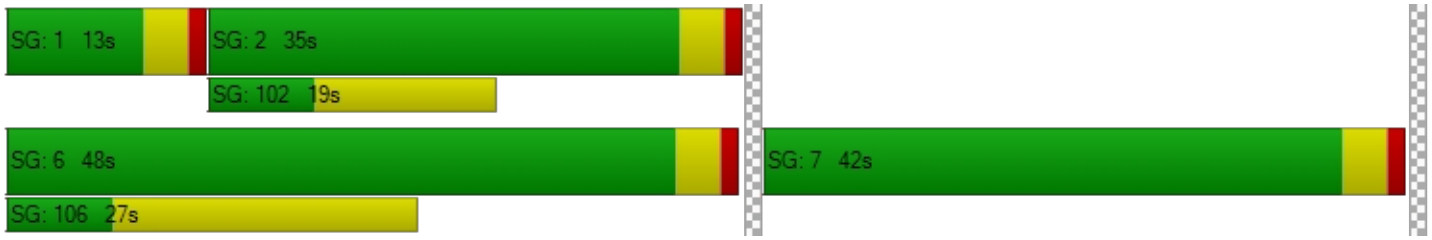
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 26.09 | 0.00 | 30.55 | 0.00 | 19.10 | 18.26 | 43.58 | 10.71 | 0.00 |
| Movement LOS | | | | C | | C | | B | B | D | B | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 28.99 | | | 18.79 | | | 14.85 | | |
| Approach LOS | A | | | C | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 19.75 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.707 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.320 | 2.475 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 844 | 689 | 978 |
| d_b, Bicycle Delay [s] | 45.01 | 15.03 | 19.35 | 11.76 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 1.560 | 3.015 | 2.740 |
| Bicycle LOS | D | A | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 15.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.660 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | | | | No | | | No | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 693 | 0 | 301 | 0 | 0 | 0 | 0 | 1572 | 586 | 0 | 1170 | 539 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 693 | 0 | 301 | 0 | 0 | 0 | 0 | 1572 | 586 | 0 | 1170 | 539 |
| Peak Hour Factor | 0.8400 | 1.0000 | 0.8400 | 1.0000 | 1.0000 | 1.0000 | 0.9710 | 0.8440 | 0.8440 | 1.0000 | 0.9530 | 0.9530 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 206 | 0 | 90 | 0 | 0 | 0 | 0 | 466 | 174 | 0 | 307 | 0 |
| Total Analysis Volume [veh/h] | 825 | 0 | 358 | 0 | 0 | 0 | 0 | 1863 | 694 | 0 | 1228 | 0 |
| Presence of On-Street Parking | No | | No | | | | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 54 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 36 | 0 |
| Vehicle Extension [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | No | | | | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | | | | | | | No | | | No | |
| Maximum Recall | No | | | | | | | No | | | No | |
| Pedestrian Recall | No | | | | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | R | | C | C | R | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 26 | 26 | | 56 | 56 | 56 | 56 |
| g / C, Green / Cycle | 0.29 | 0.29 | | 0.63 | 0.63 | 0.63 | 0.63 |
| (v / s)_i Volume / Saturation Flow Rate | 0.24 | 0.19 | | 0.34 | 0.34 | 0.34 | 0.22 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | | 3800 | 1900 | 1900 | 5700 |
| c, Capacity [veh/h] | 998 | 542 | | 2378 | 1189 | 1189 | 3567 |
| d1, Uniform Delay [s] | 30.03 | 28.28 | | 9.48 | 9.48 | 9.48 | 8.01 |
| k, delay calibration | 0.11 | 0.11 | | 0.50 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.82 | 1.39 | | 0.88 | 1.75 | 1.75 | 0.26 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.83 | 0.66 | | 0.54 | 0.54 | 0.54 | 0.34 |
| d, Delay for Lane Group [s/veh] | 31.85 | 29.67 | | 10.35 | 11.22 | 11.22 | 8.28 |
| Lane Group LOS | C | C | | B | B | B | A |
| Critical Lane Group | Yes | No | | Yes | No | No | No |
| 50th-Percentile Queue Length [veh/ln] | 8.32 | 6.81 | | 6.52 | 6.81 | 6.81 | 3.46 |
| 50th-Percentile Queue Length [ft/ln] | 208.12 | 170.16 | | 163.12 | 170.30 | 170.30 | 86.61 |
| 95th-Percentile Queue Length [veh/ln] | 13.06 | 11.09 | | 10.71 | 11.09 | 11.09 | 6.24 |
| 95th-Percentile Queue Length [ft/ln] | 326.41 | 277.13 | | 267.85 | 277.31 | 277.31 | 155.90 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 31.85 | 0.00 | 29.67 | 0.00 | 0.00 | 0.00 | 0.00 | 10.43 | 11.22 | 0.00 | 8.28 | 0.00 |
| Movement LOS | C | | C | | | | | B | B | | A | |
| d_A, Approach Delay [s/veh] | 31.19 | | | 0.00 | | | 10.79 | | | 8.28 | | |
| Approach LOS | C | | | A | | | B | | | A | | |
| d_I, Intersection Delay [s/veh] | 15.03 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.660 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 0.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.63 | 0.00 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.665 | 0.000 | 0.000 | 0.000 |
| Crosswalk LOS | B | F | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1112 | 0 | 712 | 712 |
| d_b, Bicycle Delay [s] | 8.86 | 44.96 | 18.65 | 18.65 |
| l_b,int, Bicycle LOS Score for Intersection | 1.560 | 4.132 | 2.966 | 2.235 |
| Bicycle LOS | A | D | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 30.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.546 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 136 | 58 | 174 | 52 | 50 | 110 | 80 | 730 | 98 | 196 | 1154 | 40 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 136 | 58 | 174 | 52 | 50 | 110 | 80 | 730 | 98 | 196 | 1154 | 40 |
| Peak Hour Factor | 0.8740 | 0.8740 | 0.8740 | 0.7860 | 0.7860 | 0.7860 | 0.9250 | 0.9250 | 0.9250 | 0.9540 | 0.9540 | 0.9540 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 39 | 17 | 50 | 17 | 16 | 35 | 22 | 197 | 26 | 51 | 302 | 10 |
| Total Analysis Volume [veh/h] | 156 | 66 | 199 | 66 | 64 | 140 | 86 | 789 | 106 | 205 | 1210 | 42 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 40 | 0 | 0 | 40 | 0 | 21 | 30 | 0 | 20 | 29 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 25 | 0 | 0 | 19 | 0 | 0 | 18 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 12 | 12 | 12 | 12 | 12 | 6 | 54 | 54 | 12 | 60 | 60 |
| g / C, Green / Cycle | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.06 | 0.60 | 0.60 | 0.14 | 0.67 | 0.67 |
| (v / s)_i Volume / Saturation Flow Rate | 0.09 | 0.03 | 0.10 | 0.04 | 0.11 | 0.05 | 0.24 | 0.23 | 0.11 | 0.32 | 0.02 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 105 | 255 | 255 | 234 | 255 | 115 | 1134 | 1134 | 244 | 2540 | 1270 |
| d1, Uniform Delay [s] | 35.84 | 34.96 | 37.69 | 35.03 | 37.81 | 41.44 | 9.65 | 9.52 | 37.98 | 7.27 | 5.07 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 227.70 | 0.53 | 5.10 | 0.65 | 5.68 | 9.17 | 1.07 | 1.00 | 7.55 | 0.64 | 0.05 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 1.48 | 0.26 | 0.78 | 0.28 | 0.80 | 0.75 | 0.40 | 0.39 | 0.84 | 0.48 | 0.03 |
| d, Delay for Lane Group [s/veh] | 263.54 | 35.49 | 42.80 | 35.68 | 43.48 | 50.61 | 10.71 | 10.52 | 45.53 | 7.92 | 5.12 |
| Lane Group LOS | F | D | D | D | D | D | B | B | D | A | A |
| Critical Lane Group | No | No | No | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 8.76 | 1.32 | 4.54 | 1.33 | 4.69 | 2.15 | 4.65 | 4.40 | 4.85 | 5.00 | 0.25 |
| 50th-Percentile Queue Length [ft/ln] | 218.94 | 33.04 | 113.40 | 33.22 | 117.36 | 53.74 | 116.34 | 110.04 | 121.24 | 125.01 | 6.20 |
| 95th-Percentile Queue Length [veh/ln] | 15.50 | 2.38 | 8.03 | 2.39 | 8.25 | 3.87 | 8.19 | 7.84 | 8.46 | 8.67 | 0.45 |
| 95th-Percentile Queue Length [ft/ln] | 387.40 | 59.47 | 200.73 | 59.80 | 206.19 | 96.74 | 204.78 | 196.05 | 211.53 | 216.69 | 11.16 |

**Movement, Approach, & Intersection Results**

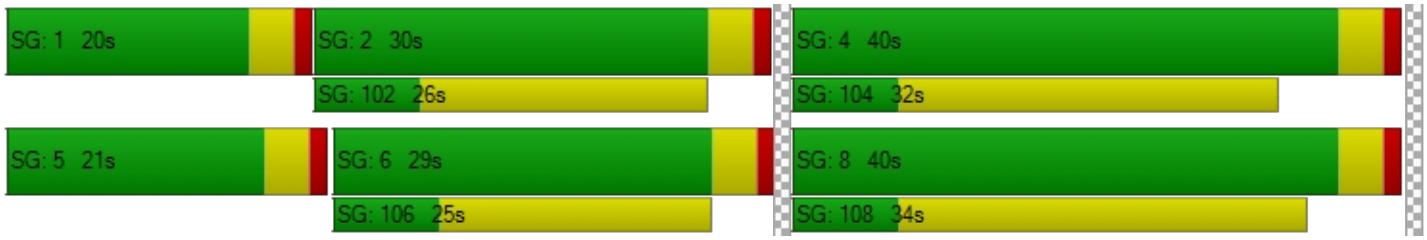
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 263.54 | 35.49 | 42.80 | 35.68 | 43.48 | 43.48 | 50.61 | 10.63 | 10.52 | 45.53 | 7.92 | 5.12 |
| Movement LOS | F | D | D | D | D | D | D | B | B | D | A | A |
| d_A, Approach Delay [s/veh] | 123.45 | | | 41.57 | | | 14.13 | | | 13.13 | | |
| Approach LOS | F | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 30.74 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.546 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.70 | 34.70 | 34.70 | 34.70 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.325 | 2.091 | 3.006 | 2.954 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 800 | 800 | 577 | 555 |
| d_b, Bicycle Delay [s] | 16.22 | 16.22 | 22.78 | 23.49 |
| l_b,int, Bicycle LOS Score for Intersection | 2.254 | 2.005 | 2.369 | 2.762 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 35.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.838 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 148 | 426 | 162 | 351 | 378 | 328 | 293 | 800 | 162 | 147 | 1023 | 673 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 148 | 426 | 162 | 351 | 378 | 328 | 293 | 800 | 162 | 147 | 1023 | 673 |
| Peak Hour Factor | 0.9210 | 0.9210 | 0.9210 | 0.9620 | 0.9620 | 0.9620 | 0.9110 | 0.9110 | 0.9110 | 0.9550 | 0.9550 | 0.9550 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 40 | 116 | 44 | 91 | 98 | 85 | 80 | 220 | 44 | 38 | 268 | 176 |
| Total Analysis Volume [veh/h] | 161 | 463 | 176 | 365 | 393 | 341 | 322 | 878 | 178 | 154 | 1071 | 705 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 110 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 10 | 39 | 0 | 18 | 47 | 0 | 16 | 42 | 0 | 11 | 37 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 19 | 19 | 13 | 26 | 26 | 12 | 55 | 55 | 7 | 50 | 50 |
| g / C, Green / Cycle | 0.05 | 0.17 | 0.17 | 0.12 | 0.23 | 0.23 | 0.11 | 0.50 | 0.50 | 0.06 | 0.46 | 0.46 |
| (v / s)_i Volume / Saturation Flow Rate | 0.05 | 0.12 | 0.09 | 0.10 | 0.21 | 0.18 | 0.09 | 0.23 | 0.09 | 0.04 | 0.28 | 0.37 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 3500 | 1900 | 1900 | 3500 | 3800 | 1900 | 3500 | 3800 | 1900 |
| c, Capacity [veh/h] | 194 | 640 | 320 | 427 | 447 | 447 | 382 | 1909 | 955 | 216 | 1729 | 864 |
| d1, Uniform Delay [s] | 51.49 | 43.34 | 41.94 | 47.38 | 40.60 | 39.24 | 48.11 | 17.73 | 15.04 | 50.69 | 22.78 | 26.01 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 8.85 | 1.57 | 1.47 | 4.97 | 6.05 | 2.73 | 5.07 | 0.80 | 0.43 | 4.32 | 1.68 | 8.37 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.83 | 0.72 | 0.55 | 0.85 | 0.88 | 0.76 | 0.84 | 0.46 | 0.19 | 0.71 | 0.62 | 0.82 |
| d, Delay for Lane Group [s/veh] | 60.34 | 44.90 | 43.42 | 52.35 | 46.64 | 41.97 | 53.18 | 18.53 | 15.47 | 55.01 | 24.46 | 34.38 |
| Lane Group LOS | E | D | D | D | D | D | D | B | B | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | 2.43 | 6.08 | 4.50 | 5.18 | 10.91 | 8.86 | 4.59 | 7.23 | 2.53 | 2.21 | 10.66 | 17.42 |
| 50th-Percentile Queue Length [ft/ln] | 60.81 | 152.05 | 112.59 | 129.44 | 272.73 | 221.49 | 114.70 | 180.83 | 63.25 | 55.21 | 266.44 | 435.62 |
| 95th-Percentile Queue Length [veh/ln] | 4.38 | 10.13 | 7.98 | 8.91 | 16.33 | 13.74 | 8.10 | 11.64 | 4.55 | 3.98 | 16.01 | 24.27 |
| 95th-Percentile Queue Length [ft/ln] | 109.46 | 253.17 | 199.60 | 222.74 | 408.15 | 343.53 | 202.52 | 291.10 | 113.84 | 99.38 | 400.29 | 606.77 |

**Movement, Approach, & Intersection Results**

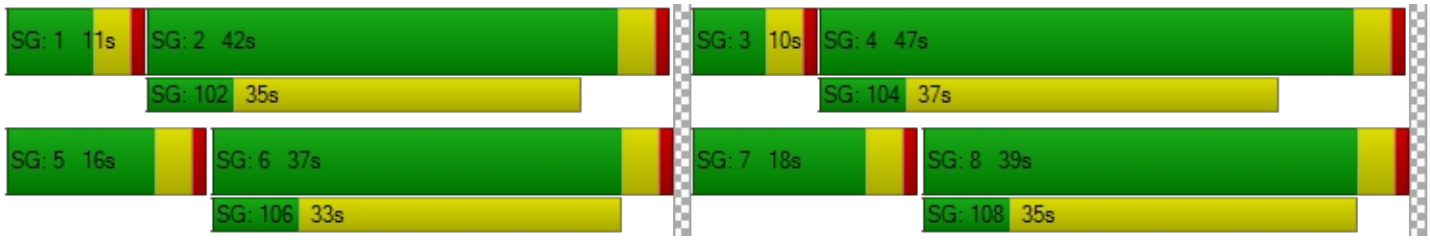
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 60.34 | 44.90 | 43.42 | 52.35 | 46.64 | 41.97 | 53.18 | 18.53 | 15.47 | 55.01 | 24.46 | 34.38 |
| Movement LOS | E | D | D | D | D | D | D | B | B | E | C | C |
| d_A, Approach Delay [s/veh] | 47.68 | | | 47.09 | | | 26.23 | | | 30.52 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 35.52 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.838 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 44.58 | 44.58 | 44.58 | 44.58 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.816 | 2.883 | 3.015 | 3.070 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 636 | 781 | 691 | 600 |
| d_b, Bicycle Delay [s] | 25.59 | 20.43 | 23.59 | 26.97 |
| l_b,int, Bicycle LOS Score for Intersection | 2.220 | 2.466 | 2.696 | 3.152 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 28.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.703 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 500 | 33 | 355 | 11 | 20 | 9 | 16 | 931 | 314 | 295 | 1318 | 18 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 500 | 33 | 355 | 11 | 20 | 9 | 16 | 931 | 314 | 295 | 1318 | 18 |
| Peak Hour Factor | 0.9370 | 0.9370 | 0.9370 | 0.8500 | 0.8500 | 0.8500 | 0.9910 | 0.9910 | 0.9910 | 0.9420 | 0.9420 | 0.9420 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 133 | 9 | 95 | 3 | 6 | 3 | 4 | 235 | 79 | 78 | 350 | 5 |
| Total Analysis Volume [veh/h] | 534 | 35 | 379 | 13 | 24 | 11 | 16 | 939 | 317 | 313 | 1399 | 19 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 6 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 30 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 23 | 60 | 60 | 0 | 37 | 0 | 10 | 44 | 0 | 16 | 50 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 7 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 26 | 0 | 26 | 0 | 0 | 27 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | No | | No | | No | No | | No | No | |
| Maximum Recall | No | No | No | | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | No | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 19 | 28 | 44 | 5 | 5 | 3 | 68 | 68 | 12 | 78 | 78 |
| g / C, Green / Cycle | 0.16 | 0.23 | 0.37 | 0.04 | 0.04 | 0.02 | 0.57 | 0.57 | 0.10 | 0.65 | 0.65 |
| (v / s)_i Volume / Saturation Flow Rate | 0.15 | 0.02 | 0.20 | 0.01 | 0.02 | 0.01 | 0.34 | 0.32 | 0.09 | 0.37 | 0.37 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 |
| c, Capacity [veh/h] | 555 | 442 | 696 | 83 | 77 | 39 | 1077 | 1077 | 352 | 1227 | 1227 |
| d1, Uniform Delay [s] | 50.15 | 36.01 | 30.09 | 55.64 | 56.27 | 57.98 | 17.17 | 16.50 | 53.34 | 12.02 | 12.01 |
| k, delay calibration | 0.11 | 0.11 | 0.30 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 10.84 | 0.08 | 1.85 | 0.87 | 4.07 | 6.81 | 2.54 | 2.10 | 7.71 | 1.99 | 1.98 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.96 | 0.08 | 0.54 | 0.16 | 0.45 | 0.41 | 0.61 | 0.56 | 0.89 | 0.58 | 0.58 |
| d, Delay for Lane Group [s/veh] | 60.99 | 36.08 | 31.94 | 56.51 | 60.35 | 64.79 | 19.71 | 18.60 | 61.04 | 14.02 | 13.99 |
| Lane Group LOS | E | D | C | E | E | E | B | B | E | B | B |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 8.77 | 0.82 | 9.01 | 0.40 | 1.13 | 0.55 | 12.24 | 10.81 | 5.04 | 10.75 | 10.72 |
| 50th-Percentile Queue Length [ft/ln] | 219.19 | 20.48 | 225.13 | 10.03 | 28.14 | 13.85 | 306.07 | 270.18 | 125.92 | 268.83 | 268.01 |
| 95th-Percentile Queue Length [veh/ln] | 13.62 | 1.47 | 13.93 | 0.72 | 2.03 | 1.00 | 17.98 | 16.20 | 8.72 | 16.13 | 16.09 |
| 95th-Percentile Queue Length [ft/ln] | 340.59 | 36.87 | 348.16 | 18.06 | 50.66 | 24.93 | 449.53 | 404.97 | 217.94 | 403.28 | 402.26 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 60.99 | 36.08 | 31.94 | 56.51 | 60.35 | 60.35 | 64.79 | 19.37 | 18.60 | 61.04 | 14.01 | 13.99 |
| Movement LOS | E | D | C | E | E | E | E | B | B | E | B | B |
| d_A, Approach Delay [s/veh] | 48.46 | | | 59.31 | | | 19.75 | | | 22.51 | | |
| Approach LOS | D | | | E | | | B | | | C | | |
| d_I, Intersection Delay [s/veh] | 28.23 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.703 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 49.52 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.727 | 1.992 | 2.941 | 2.983 |
| Crosswalk LOS | B | A | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 933 | 550 | 666 | 766 |
| d_b, Bicycle Delay [s] | 17.08 | 31.55 | 26.68 | 22.83 |
| l_b,int, Bicycle LOS Score for Intersection | 3.124 | 1.639 | 2.609 | 2.988 |
| Bicycle LOS | C | A | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 18.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.197 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 48 | 325 | 43 | 28 | 260 | 30 | 65 | 4 | 52 | 75 | 4 | 38 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 48 | 325 | 43 | 28 | 260 | 30 | 65 | 4 | 52 | 75 | 4 | 38 |
| Peak Hour Factor | 0.9560 | 0.9560 | 0.9560 | 0.9590 | 0.9590 | 0.9590 | 0.6990 | 0.6990 | 0.6990 | 0.8710 | 0.8710 | 0.8710 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 13 | 85 | 11 | 7 | 68 | 8 | 23 | 1 | 19 | 22 | 1 | 11 |
| Total Analysis Volume [veh/h] | 50 | 340 | 45 | 29 | 271 | 31 | 93 | 6 | 74 | 86 | 5 | 44 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 11 | 26 | 0 | 10 | 25 | 0 | 0 | 54 | 0 | 0 | 54 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 12 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | L | C | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 4 | 68 | 68 | 3 | 67 | 67 | 7 | 7 | 7 | 7 |
| g / C, Green / Cycle | 0.05 | 0.76 | 0.76 | 0.04 | 0.74 | 0.74 | 0.08 | 0.08 | 0.08 | 0.08 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.10 | 0.10 | 0.02 | 0.08 | 0.08 | 0.05 | 0.04 | 0.05 | 0.03 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 88 | 1435 | 1435 | 64 | 1410 | 1410 | 139 | 145 | 111 | 145 |
| d1, Uniform Delay [s] | 41.91 | 3.01 | 3.00 | 42.56 | 3.26 | 3.26 | 40.53 | 40.12 | 40.36 | 39.45 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.70 | 0.20 | 0.19 | 4.91 | 0.15 | 0.15 | 5.42 | 3.28 | 11.02 | 1.37 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.57 | 0.14 | 0.13 | 0.45 | 0.11 | 0.11 | 0.67 | 0.55 | 0.78 | 0.34 |
|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 47.61 | 3.21 | 3.19 | 47.47 | 3.42 | 3.41 | 45.94 | 43.40 | 51.38 | 40.82 |
| Lane Group LOS | D | A | A | D | A | A | D | D | D | D |
| Critical Lane Group | No | Yes | No | Yes | No | No | Yes | No | No | No |
| 50th-Percentile Queue Length [veh/ln] | 1.21 | 0.78 | 0.75 | 0.71 | 0.65 | 0.63 | 2.19 | 1.82 | 2.17 | 1.07 |
| 50th-Percentile Queue Length [ft/ln] | 30.37 | 19.47 | 18.86 | 17.84 | 16.22 | 15.86 | 54.84 | 45.53 | 54.15 | 26.82 |
| 95th-Percentile Queue Length [veh/ln] | 2.19 | 1.40 | 1.36 | 1.28 | 1.17 | 1.14 | 3.95 | 3.28 | 3.90 | 1.93 |
| 95th-Percentile Queue Length [ft/ln] | 54.67 | 35.04 | 33.94 | 32.12 | 29.19 | 28.55 | 98.71 | 81.96 | 97.47 | 48.27 |

**Movement, Approach, & Intersection Results**

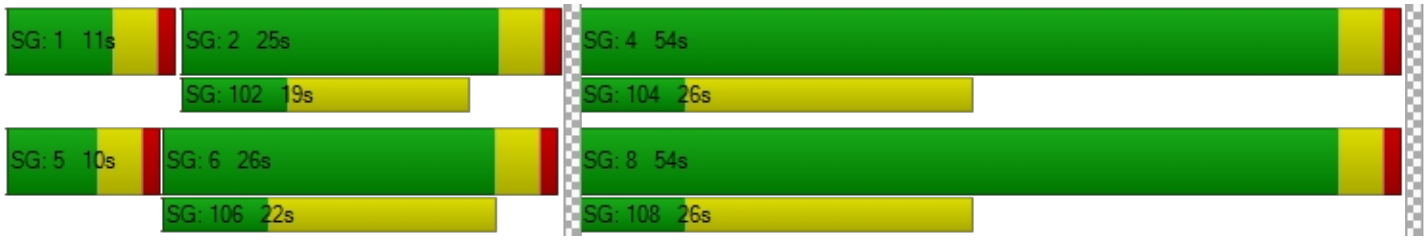
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 47.61 | 3.20 | 3.19 | 47.47 | 3.41 | 3.41 | 45.94 | 43.40 | 43.40 | 51.38 | 40.82 | 40.82 |
| Movement LOS | D | A | A | D | A | A | D | D | D | D | D | D |
| d_A, Approach Delay [s/veh] | 8.31 | | | 7.27 | | | 44.77 | | | 47.55 | | |
| Approach LOS | A | | | A | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 18.79 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.197 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.591 | 2.589 | 2.024 | 2.010 |
| Crosswalk LOS | B | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 489 | 467 | 1111 | 1111 |
| d_b, Bicycle Delay [s] | 25.70 | 26.46 | 8.90 | 8.90 |
| l_b,int, Bicycle LOS Score for Intersection | 1.918 | 1.833 | 1.845 | 1.782 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 18.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.355 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 17 | 338 | 322 | 37 | 373 | 20 | 18 | 3 | 12 | 274 | 3 | 47 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 17 | 338 | 322 | 37 | 373 | 20 | 18 | 3 | 12 | 274 | 3 | 47 |
| Peak Hour Factor | 0.9560 | 0.9560 | 0.9560 | 0.9310 | 0.9310 | 0.9310 | 0.9380 | 0.9380 | 0.9380 | 0.8620 | 0.8620 | 0.8620 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 88 | 84 | 10 | 100 | 5 | 5 | 1 | 3 | 79 | 1 | 14 |
| Total Analysis Volume [veh/h] | 18 | 354 | 337 | 40 | 401 | 21 | 19 | 3 | 13 | 318 | 3 | 55 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 29 | 0 | 10 | 29 | 0 | 0 | 30 | 0 | 0 | 31 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 17 | 0 | 0 | 18 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | C | R | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 0.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 71 | 63 | 63 | 71 | 65 | 65 | 4 | 4 | 13 | 13 |
| g / C, Green / Cycle | 0.71 | 0.63 | 0.63 | 0.71 | 0.65 | 0.65 | 0.04 | 0.04 | 0.13 | 0.13 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.19 | 0.18 | 0.02 | 0.11 | 0.11 | 0.01 | 0.01 | 0.11 | 0.10 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 1297 | 1197 | 1197 | 1223 | 1228 | 1228 | 68 | 72 | 237 | 250 |
| d1, Uniform Delay [s] | 4.23 | 8.43 | 8.34 | 4.29 | 7.04 | 7.03 | 46.89 | 46.63 | 42.22 | 41.80 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.00 | 0.63 | 0.59 | 0.05 | 0.31 | 0.30 | 2.69 | 1.19 | 6.39 | 4.27 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.01 | 0.30 | 0.28 | 0.03 | 0.17 | 0.17 | 0.32 | 0.18 | 0.81 | 0.74 |
|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 4.24 | 9.06 | 8.92 | 4.34 | 7.35 | 7.33 | 49.57 | 47.82 | 48.61 | 46.07 |
| Lane Group LOS | A | A | A | A | A | A | D | D | D | D |
| Critical Lane Group | No | Yes | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.10 | 3.42 | 3.22 | 0.23 | 1.76 | 1.73 | 0.58 | 0.34 | 4.96 | 4.65 |
| 50th-Percentile Queue Length [ft/ln] | 2.38 | 85.53 | 80.49 | 5.68 | 43.97 | 43.34 | 14.56 | 8.40 | 124.10 | 116.26 |
| 95th-Percentile Queue Length [veh/ln] | 0.17 | 6.16 | 5.80 | 0.41 | 3.17 | 3.12 | 1.05 | 0.60 | 8.62 | 8.19 |
| 95th-Percentile Queue Length [ft/ln] | 4.28 | 153.96 | 144.89 | 10.23 | 79.14 | 78.01 | 26.20 | 15.12 | 215.45 | 204.67 |

**Movement, Approach, & Intersection Results**

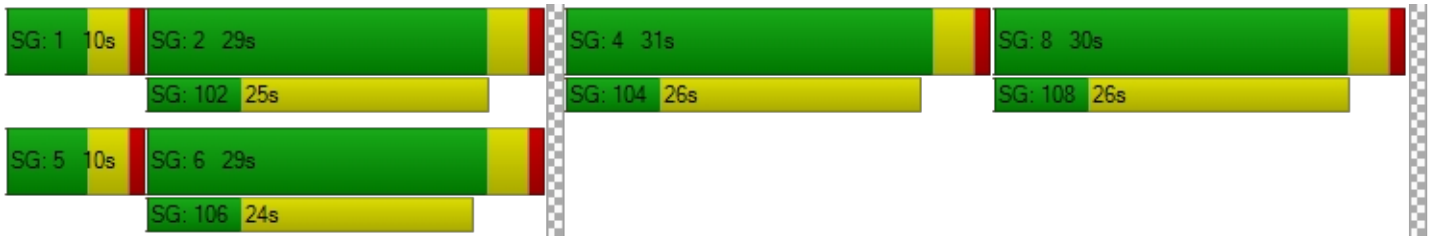
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 4.24 | 9.06 | 8.92 | 4.34 | 7.34 | 7.33 | 49.57 | 49.57 | 47.82 | 47.59 | 46.07 | 46.07 |
| Movement LOS | A | A | A | A | A | A | D | D | D | D | D | D |
| d_A, Approach Delay [s/veh] | 8.87 | | | 7.08 | | | 48.92 | | | 47.36 | | |
| Approach LOS | A | | | A | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 18.38 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.355 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 39.62 | 39.62 | 39.62 | 39.62 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.586 | 2.478 | 1.987 | 2.228 |
| Crosswalk LOS | B | B | A | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 500 | 500 | 520 | 540 |
| d_b, Bicycle Delay [s] | 28.14 | 28.14 | 27.40 | 26.66 |
| l_b,int, Bicycle LOS Score for Intersection | 2.145 | 1.941 | 1.617 | 2.180 |
| Bicycle LOS | B | A | A | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 30.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.636 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 144 | 25 | 67 | 45 | 19 | 383 | 494 | 568 | 23 | 99 | 467 | 27 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 144 | 25 | 67 | 45 | 19 | 383 | 494 | 568 | 23 | 99 | 467 | 27 |
| Peak Hour Factor | 0.8330 | 0.8330 | 0.8330 | 0.9000 | 0.9000 | 0.9000 | 0.8700 | 0.8700 | 0.8700 | 0.9090 | 0.9090 | 0.9090 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 43 | 8 | 20 | 13 | 5 | 106 | 142 | 163 | 7 | 27 | 128 | 7 |
| Total Analysis Volume [veh/h] | 173 | 30 | 80 | 50 | 21 | 426 | 568 | 653 | 26 | 109 | 514 | 30 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 6 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 30 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 37 | 0 | 0 | 10 | 10 | 41 | 31 | 0 | 42 | 32 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 21 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | No | No | No | | No | No | |
| Maximum Recall | | No | | | No | No | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | No | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | C | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 11 | 11 | 11 | 6 | 6 | 50 | 25 | 78 | 78 | 9 | 62 | 62 |
| g / C, Green / Cycle | 0.09 | 0.09 | 0.09 | 0.05 | 0.05 | 0.42 | 0.21 | 0.65 | 0.65 | 0.08 | 0.52 | 0.52 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.07 | 0.04 | 0.03 | 0.01 | 0.22 | 0.16 | 0.18 | 0.18 | 0.06 | 0.14 | 0.14 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 1900 | 1900 |
| c, Capacity [veh/h] | 197 | 215 | 171 | 93 | 98 | 790 | 727 | 1231 | 1231 | 139 | 983 | 983 |
| d1, Uniform Delay [s] | 51.90 | 53.54 | 51.92 | 55.58 | 54.64 | 26.42 | 45.01 | 9.07 | 9.04 | 54.45 | 16.34 | 16.29 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.38 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.21 | 2.62 | 1.98 | 4.80 | 1.08 | 1.99 | 1.88 | 0.56 | 0.55 | 9.33 | 0.71 | 0.69 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.38 | 0.59 | 0.47 | 0.54 | 0.21 | 0.54 | 0.78 | 0.28 | 0.27 | 0.79 | 0.28 | 0.27 |
| d, Delay for Lane Group [s/veh] | 53.11 | 56.15 | 53.90 | 60.38 | 55.72 | 28.41 | 46.89 | 9.63 | 9.59 | 63.78 | 17.04 | 16.98 |
| Lane Group LOS | D | E | D | E | E | C | D | A | A | E | B | B |
| Critical Lane Group | No | Yes | No | No | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 2.22 | 3.93 | 2.39 | 1.60 | 0.64 | 9.55 | 8.16 | 3.86 | 3.80 | 3.60 | 4.43 | 4.34 |
| 50th-Percentile Queue Length [ft/ln] | 55.52 | 98.35 | 59.68 | 40.08 | 16.01 | 238.66 | 204.03 | 96.57 | 95.11 | 89.96 | 110.75 | 108.51 |
| 95th-Percentile Queue Length [veh/ln] | 4.00 | 7.08 | 4.30 | 2.89 | 1.15 | 14.61 | 12.85 | 6.95 | 6.85 | 6.48 | 7.88 | 7.76 |
| 95th-Percentile Queue Length [ft/ln] | 99.94 | 177.03 | 107.43 | 72.15 | 28.82 | 365.33 | 321.16 | 173.83 | 171.20 | 161.93 | 197.05 | 193.93 |

**Movement, Approach, & Intersection Results**

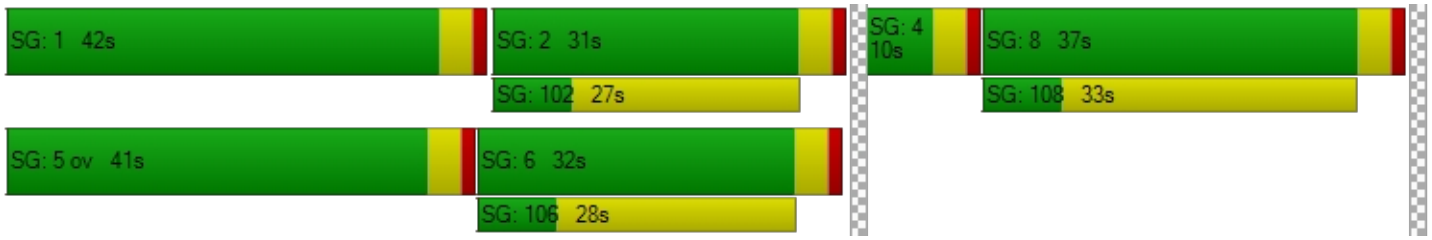
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 54.77 | 56.15 | 53.90 | 60.38 | 55.72 | 28.41 | 46.89 | 9.61 | 9.59 | 63.78 | 17.01 | 16.98 |
| Movement LOS | D | E | D | E | E | C | D | A | A | E | B | B |
| d_A, Approach Delay [s/veh] | 54.71 | | | 32.78 | | | 26.59 | | | 24.82 | | |
| Approach LOS | D | | | C | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 30.27 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.636 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 0.00 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.399 | 2.533 | 0.000 | 2.594 |
| Crosswalk LOS | B | B | F | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 550 | 100 | 450 | 466 |
| d_b, Bicycle Delay [s] | 31.57 | 54.18 | 36.07 | 35.30 |
| l_b,int, Bicycle LOS Score for Intersection | 2.027 | 1.970 | 2.588 | 2.098 |
| Bicycle LOS | B | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 47.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.922 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 443 | 1174 | 232 | 274 | 976 | 418 | 320 | 1289 | 298 | 450 | 1606 | 285 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 443 | 1174 | 232 | 274 | 976 | 418 | 320 | 1289 | 298 | 450 | 1606 | 285 |
| Peak Hour Factor | 0.9550 | 0.9550 | 0.9550 | 0.9460 | 0.9460 | 0.9460 | 0.9460 | 0.9460 | 0.9460 | 0.9450 | 0.9450 | 0.9450 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 116 | 307 | 61 | 72 | 258 | 110 | 85 | 341 | 79 | 119 | 425 | 75 |
| Total Analysis Volume [veh/h] | 464 | 1229 | 243 | 290 | 1032 | 442 | 338 | 1363 | 315 | 476 | 1699 | 302 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 19 | 42 | 0 | 16 | 39 | 0 | 17 | 42 | 0 | 20 | 45 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 31 | 0 | 0 | 28 | 0 | 0 | 31 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 15 | 35 | 35 | 12 | 32 | 32 | 13 | 41 | 41 | 16 | 44 | 44 |
| g / C, Green / Cycle | 0.13 | 0.29 | 0.29 | 0.10 | 0.26 | 0.26 | 0.11 | 0.34 | 0.34 | 0.13 | 0.37 | 0.37 |
| (v / s)_i Volume / Saturation Flow Rate | 0.13 | 0.22 | 0.13 | 0.08 | 0.18 | 0.23 | 0.10 | 0.30 | 0.29 | 0.14 | 0.30 | 0.16 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 440 | 1647 | 549 | 348 | 1496 | 499 | 383 | 1309 | 654 | 469 | 2105 | 702 |
| d1, Uniform Delay [s] | 52.50 | 38.72 | 34.82 | 53.12 | 39.90 | 42.58 | 52.74 | 36.76 | 36.24 | 52.01 | 34.05 | 28.41 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.31 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 35.76 | 0.69 | 0.56 | 5.26 | 0.58 | 13.84 | 6.81 | 7.77 | 12.01 | 22.88 | 3.45 | 1.93 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 1.05 | 0.75 | 0.44 | 0.83 | 0.69 | 0.89 | 0.88 | 0.86 | 0.84 | 1.01 | 0.81 | 0.43 |
| d, Delay for Lane Group [s/veh] | 88.26 | 39.41 | 35.38 | 58.38 | 40.48 | 56.42 | 59.55 | 44.53 | 48.25 | 74.89 | 37.49 | 30.34 |
| Lane Group LOS | F | D | D | E | D | E | E | D | D | F | D | C |
| Critical Lane Group | Yes | No | No | No | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 8.81 | 10.97 | 5.88 | 4.55 | 9.19 | 14.41 | 5.38 | 16.70 | 16.75 | 8.54 | 15.32 | 6.89 |
| 50th-Percentile Queue Length [ft/ln] | 220.23 | 274.21 | 147.03 | 113.74 | 229.73 | 360.20 | 134.56 | 417.57 | 418.81 | 213.51 | 382.94 | 172.33 |
| 95th-Percentile Queue Length [veh/ln] | 13.98 | 16.40 | 9.86 | 8.05 | 14.16 | 20.63 | 9.19 | 23.41 | 23.46 | 13.42 | 21.74 | 11.20 |
| 95th-Percentile Queue Length [ft/ln] | 349.52 | 409.99 | 246.45 | 201.19 | 354.02 | 515.83 | 229.68 | 585.14 | 586.62 | 335.40 | 543.40 | 279.98 |

**Movement, Approach, & Intersection Results**

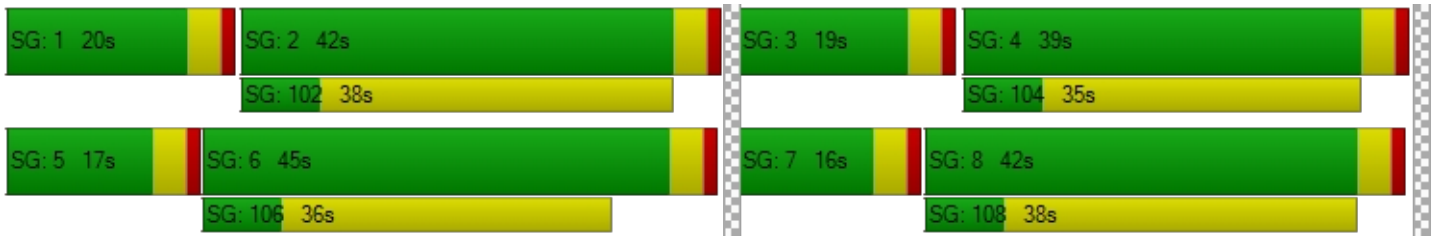
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 88.26 | 39.41 | 35.38 | 58.38 | 40.48 | 56.42 | 59.55 | 45.16 | 48.25 | 74.89 | 37.49 | 30.34 |
| Movement LOS | F | D | D | E | D | E | E | D | D | F | D | C |
| d_A, Approach Delay [s/veh] | 50.61 | | | 47.41 | | | 48.06 | | | 43.81 | | |
| Approach LOS | D | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 47.24 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.922 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.270 | 3.257 | 3.302 | 3.337 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 633 | 583 | 633 | 683 |
| d_b, Bicycle Delay [s] | 28.04 | 30.13 | 28.04 | 26.03 |
| l_b,int, Bicycle LOS Score for Intersection | 2.624 | 2.530 | 2.668 | 2.922 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 19.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.691 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 36 | 49 | 84 | 189 | 108 | 217 | 139 | 1613 | 38 | 107 | 1824 | 279 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 36 | 49 | 84 | 189 | 108 | 217 | 139 | 1613 | 38 | 107 | 1824 | 279 |
| Peak Hour Factor | 0.7970 | 0.7970 | 0.7970 | 0.6700 | 0.6700 | 0.6700 | 0.9700 | 0.9700 | 0.9700 | 0.9160 | 0.9160 | 0.9160 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 11 | 15 | 26 | 71 | 40 | 81 | 36 | 416 | 10 | 29 | 498 | 76 |
| Total Analysis Volume [veh/h] | 45 | 61 | 105 | 282 | 161 | 324 | 143 | 1663 | 39 | 117 | 1991 | 305 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 43 | 0 | 0 | 43 | 0 | 13 | 36 | 0 | 11 | 34 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 23 | 0 | 0 | 17 | 0 | 0 | 23 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 18 | 18 | 18 | 18 | 18 | 18 | 9 | 53 | 53 | 7 | 51 | 51 |
| g / C, Green / Cycle | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.10 | 0.58 | 0.58 | 0.08 | 0.56 | 0.56 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.03 | 0.06 | 0.16 | 0.04 | 0.17 | 0.08 | 0.29 | 0.31 | 0.07 | 0.35 | 0.16 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 351 | 389 | 389 | 367 | 778 | 389 | 178 | 2213 | 1106 | 143 | 3210 | 1070 |
| d1, Uniform Delay [s] | 29.21 | 29.42 | 30.15 | 33.77 | 29.74 | 34.34 | 39.74 | 11.15 | 11.33 | 40.81 | 13.21 | 10.24 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.16 | 0.19 | 0.37 | 3.42 | 0.13 | 4.67 | 8.22 | 0.83 | 1.79 | 10.63 | 0.91 | 0.67 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.13 | 0.16 | 0.27 | 0.77 | 0.21 | 0.83 | 0.80 | 0.51 | 0.53 | 0.82 | 0.62 | 0.29 |
| d, Delay for Lane Group [s/veh] | 29.37 | 29.61 | 30.51 | 37.20 | 29.87 | 39.01 | 47.96 | 11.98 | 13.12 | 51.44 | 14.12 | 10.91 |
| Lane Group LOS | C | C | C | D | C | D | D | B | B | D | B | B |
| Critical Lane Group | No | No | No | No | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.80 | 1.09 | 1.93 | 6.04 | 1.44 | 7.15 | 3.46 | 6.24 | 6.87 | 2.95 | 8.45 | 3.11 |
| 50th-Percentile Queue Length [ft/ln] | 20.03 | 27.31 | 48.27 | 150.94 | 36.11 | 178.77 | 86.56 | 155.96 | 171.74 | 73.66 | 211.18 | 77.79 |
| 95th-Percentile Queue Length [veh/ln] | 1.44 | 1.97 | 3.48 | 10.07 | 2.60 | 11.54 | 6.23 | 10.33 | 11.17 | 5.30 | 13.21 | 5.60 |
| 95th-Percentile Queue Length [ft/ln] | 36.05 | 49.15 | 86.88 | 251.69 | 64.99 | 288.40 | 155.81 | 258.37 | 279.20 | 132.58 | 330.35 | 140.02 |

**Movement, Approach, & Intersection Results**

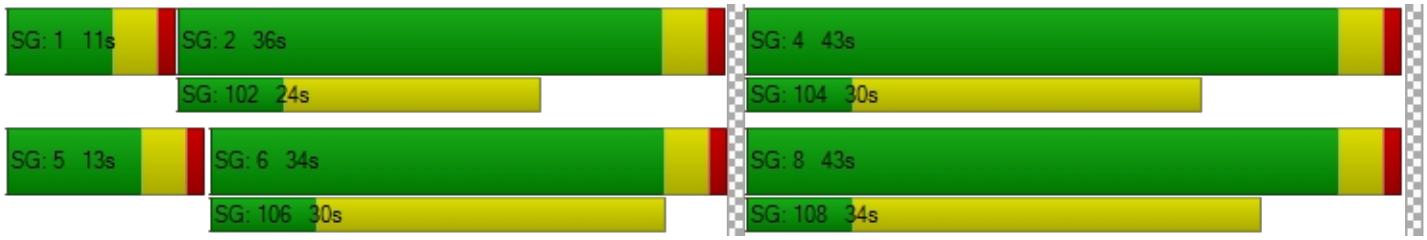
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 29.37 | 29.61 | 30.51 | 37.20 | 29.87 | 39.01 | 47.96 | 12.35 | 13.12 | 51.44 | 14.12 | 10.91 |
| Movement LOS | C | C | C | D | C | D | D | B | B | D | B | B |
| d_A, Approach Delay [s/veh] | 30.01 | | | 36.42 | | | 15.13 | | | 15.53 | | |
| Approach LOS | C | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 19.03 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.691 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.70 | 34.70 | 34.70 | 34.70 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.402 | 2.548 | 3.243 | 3.670 |
| Crosswalk LOS | B | B | C | D |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 866 | 866 | 711 | 666 |
| d_b, Bicycle Delay [s] | 14.47 | 14.47 | 18.71 | 20.02 |
| l_b,int, Bicycle LOS Score for Intersection | 1.908 | 2.192 | 2.574 | 2.887 |
| Bicycle LOS | A | B | B | C |

## Sequence

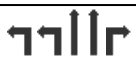
| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 41.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.878 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 536 | 890 | 276 | 264 | 696 | 217 | 242 | 1836 | 433 | 253 | 1850 | 197 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 536 | 890 | 276 | 264 | 696 | 217 | 242 | 1836 | 433 | 253 | 1850 | 197 |
| Peak Hour Factor | 0.9630 | 0.9630 | 0.9630 | 0.9380 | 0.9380 | 0.9380 | 0.9710 | 0.9710 | 0.9710 | 0.9670 | 0.9670 | 0.9670 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 139 | 231 | 72 | 70 | 186 | 58 | 62 | 473 | 111 | 65 | 478 | 51 |
| Total Analysis Volume [veh/h] | 557 | 924 | 287 | 281 | 742 | 231 | 249 | 1891 | 446 | 262 | 1913 | 204 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 24 | 47 | 0 | 16 | 39 | 0 | 13 | 43 | 0 | 14 | 44 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 20 | 35 | 35 | 12 | 27 | 27 | 9 | 47 | 47 | 10 | 48 | 48 |
| g / C, Green / Cycle | 0.17 | 0.29 | 0.29 | 0.10 | 0.22 | 0.22 | 0.08 | 0.39 | 0.39 | 0.08 | 0.40 | 0.40 |
| (v / s)_i Volume / Saturation Flow Rate | 0.16 | 0.16 | 0.15 | 0.08 | 0.20 | 0.12 | 0.07 | 0.33 | 0.23 | 0.07 | 0.34 | 0.11 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 585 | 1673 | 558 | 340 | 849 | 424 | 267 | 2233 | 744 | 296 | 2280 | 760 |
| d1, Uniform Delay [s] | 49.55 | 35.78 | 35.31 | 53.25 | 45.01 | 41.24 | 55.17 | 33.26 | 29.04 | 54.41 | 32.55 | 24.23 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 9.25 | 0.29 | 0.74 | 5.15 | 3.02 | 1.09 | 13.83 | 4.21 | 3.55 | 8.69 | 3.91 | 0.87 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.95 | 0.55 | 0.51 | 0.83 | 0.87 | 0.54 | 0.93 | 0.85 | 0.60 | 0.89 | 0.84 | 0.27 |
| d, Delay for Lane Group [s/veh] | 58.80 | 36.06 | 36.05 | 58.40 | 48.03 | 42.32 | 69.01 | 37.46 | 32.59 | 63.10 | 36.46 | 25.09 |
| Lane Group LOS | E | D | D | E | D | D | E | D | C | E | D | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 9.00 | 7.64 | 7.10 | 4.41 | 10.97 | 6.18 | 4.26 | 17.26 | 10.86 | 4.27 | 17.23 | 4.09 |
| 50th-Percentile Queue Length [ft/ln] | 224.97 | 191.08 | 177.57 | 110.14 | 274.21 | 154.55 | 106.46 | 431.40 | 271.45 | 106.87 | 430.82 | 102.25 |
| 95th-Percentile Queue Length [veh/ln] | 13.92 | 12.18 | 11.47 | 7.85 | 16.40 | 10.26 | 7.64 | 24.07 | 16.26 | 7.67 | 24.04 | 7.36 |
| 95th-Percentile Queue Length [ft/ln] | 347.96 | 304.43 | 286.84 | 196.19 | 410.00 | 256.49 | 191.07 | 601.71 | 406.55 | 191.64 | 601.02 | 184.05 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 58.80 | 36.06 | 36.05 | 58.40 | 48.03 | 42.32 | 69.01 | 37.46 | 32.59 | 63.10 | 36.46 | 25.09 |
| Movement LOS | E | D | D | E | D | D | E | D | C | E | D | C |
| d_A, Approach Delay [s/veh] | 43.22 | | | 49.30 | | | 39.66 | | | 38.42 | | |
| Approach LOS | D | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 41.59 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.878 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.131 | 3.060 | 3.436 | 3.387 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 716 | 583 | 650 | 666 |
| d_b, Bicycle Delay [s] | 24.73 | 30.13 | 27.37 | 26.69 |
| l_b,int, Bicycle LOS Score for Intersection | 2.532 | 2.594 | 2.982 | 2.868 |
| Bicycle LOS | B | B | C | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 25.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.763 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 58 | 39 | 69 | 333 | 30 | 219 | 257 | 1807 | 45 | 73 | 2051 | 339 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 58 | 39 | 69 | 333 | 30 | 219 | 257 | 1807 | 45 | 73 | 2051 | 339 |
| Peak Hour Factor | 0.8890 | 0.8890 | 0.8890 | 0.8820 | 0.8820 | 0.8820 | 0.9540 | 0.9540 | 0.9540 | 0.9450 | 0.9450 | 0.9450 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 16 | 11 | 19 | 94 | 9 | 62 | 67 | 474 | 12 | 19 | 543 | 90 |
| Total Analysis Volume [veh/h] | 65 | 44 | 78 | 378 | 34 | 248 | 269 | 1894 | 47 | 77 | 2170 | 359 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 105 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 10 | 0 | 0 | 41 | 0 | 14 | 44 | 0 | 10 | 40 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 28 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 7 | 7 | 7 | 19 | 19 | 10 | 58 | 58 | 6 | 54 | 54 |
| g / C, Green / Cycle | 0.06 | 0.06 | 0.06 | 0.18 | 0.18 | 0.09 | 0.55 | 0.55 | 0.06 | 0.51 | 0.51 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.03 | 0.04 | 0.11 | 0.15 | 0.08 | 0.34 | 0.35 | 0.04 | 0.38 | 0.19 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 3500 | 1900 | 3500 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 114 | 114 | 120 | 632 | 343 | 333 | 2083 | 1042 | 100 | 2900 | 967 |
| d1, Uniform Delay [s] | 47.54 | 47.56 | 48.09 | 39.58 | 41.46 | 46.61 | 16.16 | 16.50 | 48.95 | 20.48 | 15.64 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 3.04 | 3.12 | 5.74 | 0.91 | 4.95 | 4.63 | 1.36 | 2.99 | 11.47 | 1.82 | 1.10 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.47 | 0.48 | 0.65 | 0.60 | 0.82 | 0.81 | 0.61 | 0.64 | 0.77 | 0.75 | 0.37 |
| d, Delay for Lane Group [s/veh] | 50.58 | 50.68 | 53.83 | 40.49 | 46.41 | 51.23 | 17.51 | 19.49 | 60.42 | 22.30 | 16.73 |
| Lane Group LOS | D | D | D | D | D | D | B | B | E | C | B |
| Critical Lane Group | No | No | Yes | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 1.46 | 1.48 | 2.18 | 4.54 | 7.44 | 3.64 | 10.26 | 11.35 | 2.31 | 13.83 | 5.35 |
| 50th-Percentile Queue Length [ft/ln] | 36.54 | 37.09 | 54.54 | 113.47 | 186.01 | 91.07 | 256.53 | 283.83 | 57.64 | 345.68 | 133.74 |
| 95th-Percentile Queue Length [veh/ln] | 2.63 | 2.67 | 3.93 | 8.03 | 11.91 | 6.56 | 15.51 | 16.88 | 4.15 | 19.93 | 9.14 |
| 95th-Percentile Queue Length [ft/ln] | 65.77 | 66.76 | 98.18 | 200.82 | 297.84 | 163.92 | 387.86 | 421.98 | 103.76 | 498.14 | 228.57 |

**Movement, Approach, & Intersection Results**

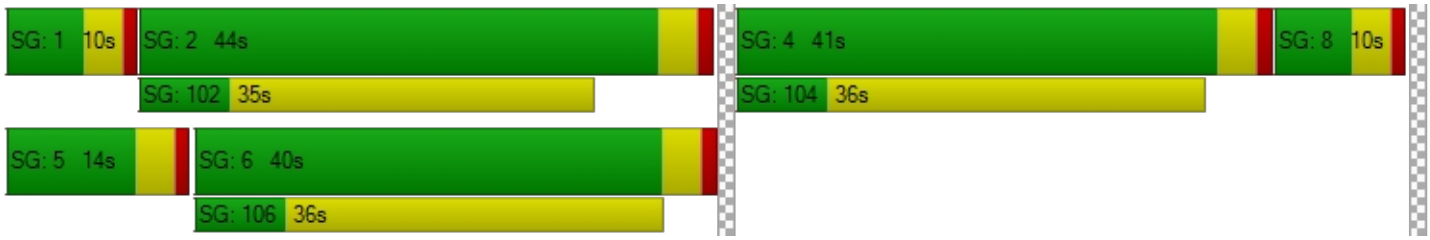
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 50.60 | 50.68 | 53.83 | 40.49 | 46.41 | 46.41 | 51.23 | 18.16 | 19.49 | 60.42 | 22.30 | 16.73 |
| Movement LOS | D | D | D | D | D | D | D | B | B | E | C | B |
| d_A, Approach Delay [s/veh] | 51.97 | | | 43.02 | | | 22.21 | | | 22.66 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 25.82 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.763 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 42.11 | 42.11 | 42.11 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.222 | 2.567 | 3.305 | 0.000 |
| Crosswalk LOS | B | B | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 114 | 704 | 761 | 685 |
| d_b, Bicycle Delay [s] | 46.70 | 22.05 | 20.14 | 22.70 |
| l_b,int, Bicycle LOS Score for Intersection | 1.714 | 2.649 | 2.775 | 2.993 |
| Bicycle LOS | A | B | C | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 62.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | E |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.047 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 385 | 598 | 370 | 446 | 315 | 98 | 112 | 1975 | 112 | 474 | 1996 | 501 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 385 | 598 | 370 | 446 | 315 | 98 | 112 | 1975 | 112 | 474 | 1996 | 501 |
| Peak Hour Factor | 0.8990 | 0.8990 | 0.8990 | 0.8970 | 0.8970 | 0.8970 | 0.9570 | 0.9570 | 0.9570 | 0.9550 | 0.9550 | 0.9550 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 107 | 166 | 103 | 124 | 88 | 27 | 29 | 516 | 29 | 124 | 523 | 131 |
| Total Analysis Volume [veh/h] | 428 | 665 | 412 | 497 | 351 | 109 | 117 | 2064 | 117 | 496 | 2090 | 525 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 29 | 41 | 0 | 27 | 39 | 0 | 10 | 34 | 0 | 18 | 42 | 42 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 23 | 0 | 0 | 23 | 23 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 17 | 29 | 29 | 23 | 35 | 35 | 6 | 37 | 37 | 14 | 46 | 73 |
| g / C, Green / Cycle | 0.14 | 0.25 | 0.25 | 0.19 | 0.29 | 0.29 | 0.05 | 0.31 | 0.31 | 0.12 | 0.38 | 0.60 |
| (v / s)_i Volume / Saturation Flow Rate | 0.12 | 0.18 | 0.22 | 0.25 | 0.13 | 0.12 | 0.03 | 0.28 | 0.30 | 0.14 | 0.37 | 0.28 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 2000 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 505 | 934 | 467 | 384 | 558 | 558 | 177 | 1776 | 592 | 412 | 2158 | 1147 |
| d1, Uniform Delay [s] | 50.12 | 41.41 | 43.63 | 48.54 | 34.31 | 33.91 | 56.02 | 39.68 | 40.70 | 53.00 | 36.62 | 13.03 |
| k, delay calibration | 0.11 | 0.11 | 0.24 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.06 | 1.02 | 11.46 | 136.97 | 0.52 | 0.45 | 4.18 | 8.23 | 29.26 | 97.59 | 13.26 | 1.32 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.85 | 0.71 | 0.88 | 1.29 | 0.43 | 0.40 | 0.66 | 0.91 | 0.96 | 1.21 | 0.97 | 0.46 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 54.18 | 42.44 | 55.08 | 185.50 | 34.83 | 34.37 | 60.20 | 47.91 | 69.97 | 150.59 | 49.88 | 14.34 |
| Lane Group LOS | D | D | E | F | C | C | E | D | E | F | D | B |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 6.54 | 9.11 | 13.20 | 13.02 | 5.75 | 5.22 | 1.85 | 16.35 | 21.18 | 11.77 | 22.24 | 7.89 |
| 50th-Percentile Queue Length [ft/ln] | 163.58 | 227.76 | 330.12 | 325.47 | 143.76 | 130.62 | 46.16 | 408.79 | 529.61 | 294.30 | 555.92 | 197.29 |
| 95th-Percentile Queue Length [veh/ln] | 10.74 | 14.06 | 19.16 | 21.21 | 9.68 | 8.97 | 3.32 | 22.98 | 28.73 | 18.72 | 29.97 | 12.50 |
| 95th-Percentile Queue Length [ft/ln] | 268.46 | 351.51 | 479.10 | 530.20 | 242.08 | 224.34 | 83.08 | 574.58 | 718.32 | 467.96 | 749.26 | 312.47 |

**Movement, Approach, & Intersection Results**

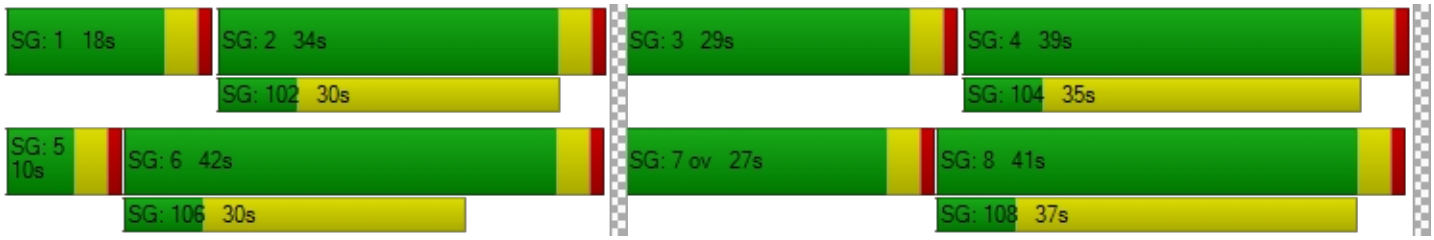
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 54.18 | 42.44 | 55.08 | 185.50 | 34.68 | 34.37 | 60.20 | 52.76 | 69.97 | 150.59 | 49.88 | 14.34 |
| Movement LOS | D | D | E | F | C | C | E | D | E | F | D | B |
| d_A, Approach Delay [s/veh] | 49.24 | | | 112.97 | | | 54.02 | | | 59.94 | | |
| Approach LOS | D | | | F | | | D | | | E | | |
| d_I, Intersection Delay [s/veh] | 62.61 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |
| Intersection V/C | 1.047 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.952 | 2.835 | 3.397 | 3.573 |
| Crosswalk LOS | C | C | C | D |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 616 | 583 | 500 | 633 |
| d_b, Bicycle Delay [s] | 28.73 | 30.13 | 33.78 | 28.04 |
| l_b,int, Bicycle LOS Score for Intersection | 2.801 | 2.349 | 2.508 | 3.271 |
| Bicycle LOS | C | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 16.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.754 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 687 | 0 | 558 | 0 | 1779 | 1031 | 0 | 2409 | 417 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 687 | 0 | 558 | 0 | 1779 | 1031 | 0 | 2409 | 417 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 0.9390 | 1.0000 | 0.9390 | 1.0000 | 0.9540 | 0.9540 | 1.0000 | 0.9730 | 0.9730 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 183 | 0 | 149 | 0 | 466 | 270 | 0 | 619 | 107 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 732 | 0 | 594 | 0 | 1865 | 1081 | 0 | 2476 | 429 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_di, Inbound Pedestrian Volume crossing m | | 0 | | | 0 | | | 0 | | | 0 | |
| v_co, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ci, Inbound Pedestrian Volume crossing mi | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ab, Corner Pedestrian Volume [ped/h] | | 0 | | | 0 | | | 0 | | | 0 | |
| Bicycle Volume [bicycles/h] | | 0 | | | 0 | | | 0 | | | 0 | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 8.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 64 | 0 | 0 | 0 | 26 | 0 | 0 | 26 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | | No | |
| Maximum Recall | | | | No | | | | No | | | No | |
| Pedestrian Recall | | | | No | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | C | R | C | C |
|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 27 | 27 | 27 | 55 | 55 |
| g / C, Green / Cycle | | 0.30 | 0.30 | 0.30 | 0.61 | 0.61 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.25 | 0.25 | 0.23 | 0.33 | 0.43 |
| s, saturation flow rate [veh/h] | | 1750 | 1750 | 1900 | 5700 | 5700 |
| c, Capacity [veh/h] | | 528 | 528 | 573 | 3473 | 3473 |
| d1, Uniform Delay [s] | | 29.31 | 29.31 | 28.55 | 10.19 | 12.12 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 3.62 | 3.62 | 2.24 | 0.60 | 1.27 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.84 | 0.84 | 0.77 | 0.54 | 0.71 |
| d, Delay for Lane Group [s/veh] | | 32.93 | 32.93 | 30.79 | 10.79 | 13.39 |
| Lane Group LOS | | C | C | C | B | B |
| Critical Lane Group | | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | | 9.13 | 9.13 | 8.73 | 6.56 | 10.46 |
| 50th-Percentile Queue Length [ft/ln] | | 228.28 | 228.28 | 218.35 | 163.88 | 261.43 |
| 95th-Percentile Queue Length [veh/ln] | | 14.09 | 14.09 | 13.58 | 10.75 | 15.76 |
| 95th-Percentile Queue Length [ft/ln] | | 352.18 | 352.18 | 339.52 | 268.85 | 394.01 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 32.93 | 0.00 | 31.34 | 0.00 | 10.79 | 0.00 | 0.00 | 13.39 | 0.00 |
| Movement LOS | | | | C | | C | | B | | | B | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 32.22 | | | 10.79 | | | 13.39 | | |
| Approach LOS | A | | | C | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 16.94 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.754 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 0.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 0.00 | 34.63 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 0.000 | 2.454 | 0.000 | 0.000 |
| Crosswalk LOS | F | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 1335 | 489 | 489 |
| d_b, Bicycle Delay [s] | 44.96 | 4.98 | 25.65 | 25.65 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 3.748 | 2.585 | 2.921 |
| Bicycle LOS | D | D | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 22.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.785 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1016 | 64 | 453 | 0 | 0 | 192 | 182 | 1920 | 381 | 0 | 2500 | 38 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1016 | 64 | 453 | 0 | 0 | 192 | 182 | 1920 | 381 | 0 | 2500 | 38 |
| Peak Hour Factor | 0.9490 | 0.9490 | 0.9490 | 1.0000 | 1.0000 | 0.8840 | 0.9510 | 0.9510 | 0.9510 | 1.0000 | 0.9830 | 0.9830 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 268 | 17 | 119 | 0 | 0 | 54 | 48 | 505 | 100 | 0 | 636 | 10 |
| Total Analysis Volume [veh/h] | 1071 | 67 | 477 | 0 | 0 | 217 | 191 | 2019 | 401 | 0 | 2543 | 39 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 0 | 6 | 6 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 39 | 0 | 0 | 0 | 21 | 21 | 51 | 0 | 0 | 30 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | | No | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | | No | No | No | | | No | |
| Maximum Recall | | No | | | | No | No | No | | | No | |
| Pedestrian Recall | | No | | | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 26 | 26 | 26 | 12 | 12 | 56 | 40 | 40 |
| g / C, Green / Cycle | 0.29 | 0.29 | 0.29 | 0.13 | 0.13 | 0.62 | 0.45 | 0.45 |
| (v / s)_i Volume / Saturation Flow Rate | 0.23 | 0.23 | 0.22 | 0.06 | 0.11 | 0.35 | 0.34 | 0.34 |
| s, saturation flow rate [veh/h] | 3500 | 1750 | 1900 | 3800 | 1800 | 5700 | 5700 | 1900 |
| c, Capacity [veh/h] | 1015 | 507 | 551 | 498 | 236 | 3541 | 2540 | 847 |
| d1, Uniform Delay [s] | 29.38 | 29.64 | 28.94 | 36.05 | 38.02 | 10.00 | 20.96 | 20.96 |
| k, delay calibration | 0.11 | 0.16 | 0.13 | 0.11 | 0.11 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.37 | 4.59 | 2.37 | 0.60 | 6.49 | 0.67 | 2.23 | 6.43 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.78 | 0.81 | 0.74 | 0.44 | 0.81 | 0.57 | 0.76 | 0.76 |
| d, Delay for Lane Group [s/veh] | 30.75 | 34.23 | 31.31 | 36.65 | 44.51 | 10.68 | 23.19 | 27.39 |
| Lane Group LOS | C | C | C | D | D | B | C | C |
| Critical Lane Group | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 7.85 | 8.60 | 8.13 | 2.21 | 4.45 | 7.08 | 11.25 | 12.24 |
| 50th-Percentile Queue Length [ft/ln] | 196.29 | 215.11 | 203.29 | 55.27 | 111.33 | 177.08 | 281.19 | 305.93 |
| 95th-Percentile Queue Length [veh/ln] | 12.45 | 13.42 | 12.81 | 3.98 | 7.91 | 11.45 | 16.75 | 17.97 |
| 95th-Percentile Queue Length [ft/ln] | 311.17 | 335.38 | 320.21 | 99.48 | 197.85 | 286.20 | 418.69 | 449.35 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 31.62 | 34.23 | 31.75 | 0.00 | 0.00 | 36.65 | 44.51 | 10.68 | 0.00 | 0.00 | 24.19 | 27.39 |
| Movement LOS | C | C | C | | | D | D | B | | | C | C |
| d_A, Approach Delay [s/veh] | 31.77 | | | 36.65 | | | 13.60 | | | 24.24 | | |
| Approach LOS | C | | | D | | | B | | | C | | |
| d_I, Intersection Delay [s/veh] | 22.93 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.785 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.614 | 2.107 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 778 | 378 | 1044 | 578 |
| d_b, Bicycle Delay [s] | 16.82 | 29.62 | 10.28 | 22.77 |
| l_b,int, Bicycle LOS Score for Intersection | 4.224 | 1.560 | 2.775 | 2.625 |
| Bicycle LOS | D | A | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 46.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.913 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 220 | 262 | 86 | 297 | 353 | 261 | 279 | 1931 | 144 | 178 | 1808 | 191 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 220 | 262 | 86 | 297 | 353 | 261 | 279 | 1931 | 144 | 178 | 1808 | 191 |
| Peak Hour Factor | 0.9100 | 0.9100 | 0.9100 | 0.8290 | 0.8290 | 0.8290 | 0.9480 | 0.9480 | 0.9480 | 0.9350 | 0.9350 | 0.9350 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 60 | 72 | 24 | 90 | 106 | 79 | 74 | 509 | 38 | 48 | 483 | 51 |
| Total Analysis Volume [veh/h] | 242 | 288 | 95 | 358 | 426 | 315 | 294 | 2037 | 152 | 190 | 1934 | 204 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 13 | 39 | 0 | 16 | 42 | 0 | 25 | 48 | 0 | 17 | 40 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 29 | 0 | 0 | 26 | 0 | 0 | 25 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 9 | 27 | 27 | 12 | 30 | 30 | 21 | 52 | 52 | 13 | 44 | 44 |
| g / C, Green / Cycle | 0.08 | 0.22 | 0.22 | 0.10 | 0.25 | 0.25 | 0.18 | 0.44 | 0.44 | 0.11 | 0.37 | 0.37 |
| (v / s)_i Volume / Saturation Flow Rate | 0.07 | 0.10 | 0.10 | 0.10 | 0.22 | 0.17 | 0.16 | 0.38 | 0.39 | 0.11 | 0.28 | 0.29 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 267 | 422 | 422 | 354 | 469 | 469 | 316 | 1651 | 826 | 197 | 2100 | 700 |
| d1, Uniform Delay [s] | 55.05 | 40.61 | 40.27 | 53.99 | 43.94 | 40.86 | 48.81 | 30.98 | 31.59 | 53.27 | 33.22 | 33.69 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.25 | 0.11 | 0.20 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 11.15 | 0.82 | 0.71 | 25.25 | 14.15 | 1.71 | 18.86 | 6.79 | 15.00 | 22.55 | 2.60 | 8.57 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.91 | 0.47 | 0.44 | 1.01 | 0.91 | 0.67 | 0.93 | 0.87 | 0.90 | 0.97 | 0.76 | 0.78 |
| d, Delay for Lane Group [s/veh] | 66.20 | 41.44 | 40.98 | 79.25 | 58.09 | 42.57 | 67.68 | 37.77 | 46.59 | 75.82 | 35.82 | 42.26 |
| Lane Group LOS | E | D | D | F | E | D | E | D | D | E | D | D |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 4.05 | 5.22 | 4.79 | 6.58 | 14.05 | 8.62 | 10.31 | 20.14 | 22.98 | 6.93 | 13.85 | 15.69 |
| 50th-Percentile Queue Length [ft/ln] | 101.14 | 130.39 | 119.66 | 164.39 | 351.19 | 215.38 | 257.67 | 503.40 | 574.59 | 173.34 | 346.24 | 392.13 |
| 95th-Percentile Queue Length [veh/ln] | 7.28 | 8.96 | 8.37 | 10.83 | 20.19 | 13.43 | 15.57 | 27.50 | 30.85 | 11.25 | 19.95 | 22.18 |
| 95th-Percentile Queue Length [ft/ln] | 182.06 | 224.03 | 209.36 | 270.76 | 504.86 | 335.72 | 389.30 | 687.38 | 771.15 | 281.30 | 498.82 | 554.51 |

**Movement, Approach, & Intersection Results**

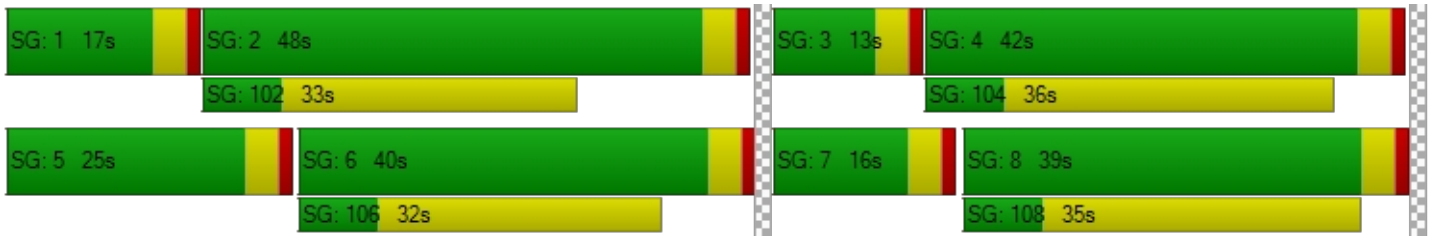
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 66.20 | 41.30 | 40.98 | 79.25 | 58.09 | 42.57 | 67.68 | 40.33 | 46.59 | 75.82 | 36.97 | 42.26 |
| Movement LOS | E | D | D | F | E | D | E | D | D | E | D | D |
| d_A, Approach Delay [s/veh] | 50.89 | | | 60.53 | | | 43.96 | | | 40.60 | | |
| Approach LOS | D | | | E | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 46.21 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.913 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.585 | 2.773 | 3.345 | 3.326 |
| Crosswalk LOS | B | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 583 | 633 | 733 | 600 |
| d_b, Bicycle Delay [s] | 30.13 | 28.04 | 24.09 | 29.43 |
| l_b,int, Bicycle LOS Score for Intersection | 2.075 | 3.373 | 2.925 | 2.520 |
| Bicycle LOS | B | C | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 26.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.835 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 248 | 48 | 272 | 26 | 23 | 15 | 19 | 1942 | 286 | 237 | 1992 | 58 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 248 | 48 | 272 | 26 | 23 | 15 | 19 | 1942 | 286 | 237 | 1992 | 58 |
| Peak Hour Factor | 0.8580 | 0.8580 | 0.8580 | 0.6480 | 0.6480 | 0.6480 | 0.9520 | 0.9520 | 0.9520 | 0.9460 | 0.9460 | 0.9460 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 72 | 14 | 79 | 10 | 9 | 6 | 5 | 510 | 75 | 63 | 526 | 15 |
| Total Analysis Volume [veh/h] | 289 | 56 | 317 | 40 | 35 | 23 | 20 | 2040 | 300 | 251 | 2106 | 61 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 95 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 27 | 0 | 0 | 10 | 0 | 10 | 32 | 0 | 26 | 48 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 14 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 18 | 18 | 18 | 6 | 6 | 3 | 40 | 40 | 15 | 53 | 53 |
| g / C, Green / Cycle | 0.19 | 0.19 | 0.19 | 0.06 | 0.06 | 0.03 | 0.42 | 0.42 | 0.16 | 0.55 | 0.55 |
| (v / s)_i Volume / Saturation Flow Rate | 0.10 | 0.10 | 0.17 | 0.02 | 0.03 | 0.01 | 0.36 | 0.16 | 0.14 | 0.37 | 0.39 |
| s, saturation flow rate [veh/h] | 1750 | 1750 | 1900 | 1800 | 1900 | 1800 | 5700 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 338 | 338 | 367 | 107 | 113 | 49 | 2382 | 794 | 291 | 2098 | 1049 |
| d1, Uniform Delay [s] | 34.35 | 34.40 | 37.19 | 43.05 | 43.42 | 45.53 | 25.11 | 19.15 | 38.87 | 15.27 | 15.66 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.18 | 1.21 | 6.14 | 2.15 | 3.58 | 5.37 | 4.23 | 1.37 | 7.53 | 1.79 | 4.03 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.51 | 0.51 | 0.86 | 0.37 | 0.51 | 0.41 | 0.86 | 0.38 | 0.86 | 0.68 | 0.71 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 35.53 | 35.61 | 43.33 | 45.20 | 46.99 | 50.90 | 29.34 | 20.52 | 46.40 | 17.06 | 19.68 |
| Lane Group LOS | D | D | D | D | D | D | C | C | D | B | B |
| Critical Lane Group | No | No | Yes | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 3.61 | 3.66 | 7.63 | 0.96 | 1.43 | 0.53 | 14.15 | 4.75 | 6.23 | 10.70 | 12.05 |
| 50th-Percentile Queue Length [ft/ln] | 90.20 | 91.60 | 190.80 | 24.07 | 35.67 | 13.37 | 353.78 | 118.72 | 155.74 | 267.52 | 301.26 |
| 95th-Percentile Queue Length [veh/ln] | 6.49 | 6.60 | 12.16 | 1.73 | 2.57 | 0.96 | 20.32 | 8.32 | 10.32 | 16.07 | 17.74 |
| 95th-Percentile Queue Length [ft/ln] | 162.37 | 164.88 | 304.07 | 43.33 | 64.20 | 24.06 | 508.02 | 208.06 | 258.07 | 401.64 | 443.59 |

**Movement, Approach, & Intersection Results**

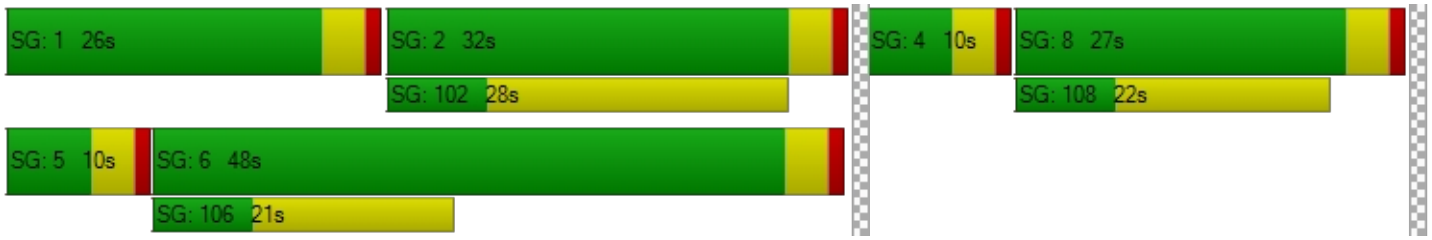
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 35.56 | 35.61 | 43.33 | 45.20 | 46.99 | 46.99 | 50.90 | 29.34 | 20.52 | 46.40 | 17.91 | 19.68 |
| Movement LOS | D | D | D | D | D | D | D | C | C | D | B | B |
| d_A, Approach Delay [s/veh] | 39.28 | | | 46.26 | | | 28.40 | | | 20.91 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 26.75 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.835 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 37.18 | 37.18 | 0.00 | 37.18 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.438 | 2.019 | 0.000 | 3.267 |
| Crosswalk LOS | B | B | F | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 484 | 126 | 589 | 926 |
| d_b, Bicycle Delay [s] | 27.32 | 41.73 | 23.66 | 13.72 |
| l_b,int, Bicycle LOS Score for Intersection | 2.652 | 1.721 | 2.858 | 2.890 |
| Bicycle LOS | B | A | C | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



Brea Mall Expansion, Brea

Vistro File: N:\...\4099 HCM Network.vistro
Report File: N:\...\Sat 2026.pdf

Scenario 6 Sat MD 2026
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | HCM 6th Edition | WB Left | 0.899 | 44.6 | D |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | HCM 6th Edition | WB Left | 0.801 | 26.2 | C |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | HCM 6th Edition | NB Left | 0.773 | 19.1 | B |
| 4 | Randolph Avenue at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.512 | 19.7 | B |
| 5 | State College Boulevard at Birch Street | Signalized | HCM 6th Edition | NB Left | 0.795 | 41.3 | D |
| 6 | S Associated Road at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.608 | 21.2 | C |
| 7 | Randolph Avenue at Madison Way | Signalized | HCM 6th Edition | WB Left | 0.257 | 20.7 | C |
| 8 | Randolph Avenue at Brea Mall | Signalized | HCM 6th Edition | EB Left | 0.486 | 23.6 | C |
| 9 | Brea Mall South at State College Boulevard | Signalized | HCM 6th Edition | WB Left | 0.829 | 32.8 | C |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.757 | 39.9 | D |
| 11 | Puente Street at Imperial Highway | Signalized | HCM 6th Edition | EB Left | 0.512 | 14.1 | B |
| 12 | Brea Boulevard at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.920 | 48.1 | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.906 | 45.3 | D |
| 14 | State College Boulevard at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 1.348 | 148.2 | F |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.849 | 20.8 | C |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | HCM 6th Edition | EB Left | 0.854 | 34.0 | C |
| 17 | Associated Road at Imperial Highway | Signalized | HCM 6th Edition | NB Left | 0.850 | 35.6 | D |
| 18 | Castlegate Lane/Placentia | Signalized | HCM 6th | EB Left | 0.811 | 23.4 | C |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | Edition | EB Left | 0.611 | 23.4 | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 44.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.899 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 139 | 276 | 389 | 547 | 387 | 5 | 19 | 1230 | 276 | 743 | 1631 | 751 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 139 | 276 | 389 | 547 | 387 | 5 | 19 | 1230 | 276 | 743 | 1631 | 751 |
| Peak Hour Factor | 0.9010 | 0.9010 | 0.9010 | 0.8760 | 0.8760 | 0.8760 | 0.8390 | 0.8390 | 0.8390 | 0.9650 | 0.9650 | 0.9650 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 39 | 77 | 108 | 156 | 110 | 1 | 6 | 367 | 82 | 192 | 423 | 195 |
| Total Analysis Volume [veh/h] | 154 | 306 | 432 | 624 | 442 | 6 | 23 | 1466 | 329 | 770 | 1690 | 778 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 10 | 27 | 0 | 27 | 44 | 0 | 10 | 39 | 0 | 27 | 56 | 56 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 28 | 0 | 0 | 22 | 22 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 6 | 20 | 20 | 20 | 23 | 37 | 37 | 3 | 38 | 38 | 23 | 58 | 85 |
| g / C, Green / Cycle | 0.05 | 0.16 | 0.16 | 0.16 | 0.19 | 0.31 | 0.31 | 0.03 | 0.32 | 0.32 | 0.19 | 0.48 | 0.71 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.14 | 0.12 | 0.12 | 0.18 | 0.12 | 0.12 | 0.01 | 0.24 | 0.23 | 0.22 | 0.30 | 0.41 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1900 | 3500 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 178 | 312 | 312 | 312 | 671 | 580 | 580 | 97 | 1819 | 606 | 671 | 2754 | 1346 |
| d1, Uniform Delay [s] | 56.58 | 48.94 | 47.90 | 47.75 | 47.72 | 32.87 | 32.85 | 57.13 | 36.51 | 36.21 | 48.52 | 22.79 | 8.65 |
| k, delay calibration | 0.11 | 0.14 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 11.90 | 9.10 | 3.76 | 3.46 | 6.37 | 0.42 | 0.42 | 1.24 | 2.82 | 7.40 | 70.42 | 1.03 | 1.82 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.87 | 0.87 | 0.76 | 0.74 | 0.93 | 0.39 | 0.39 | 0.24 | 0.75 | 0.73 | 1.15 | 0.61 | 0.58 |
| d, Delay for Lane Group [s/veh] | 68.48 | 58.04 | 51.66 | 51.21 | 54.09 | 33.30 | 33.27 | 58.37 | 39.34 | 43.61 | 118.94 | 23.82 | 10.47 |
| Lane Group LOS | E | E | D | D | D | C | C | E | D | D | F | C | B |
| Critical Lane Group | No | Yes | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.61 | 8.70 | 7.06 | 6.86 | 9.73 | 5.23 | 5.20 | 0.36 | 12.22 | 12.58 | 16.56 | 11.74 | 9.67 |
| 50th-Percentile Queue Length [ft/ln] | 65.29 | 217.3 | 176.4 | 171.6 | 243.28 | 130.77 | 130.08 | 8.97 | 305.46 | 314.54 | 414.00 | 293.42 | 241.76 |
| 95th-Percentile Queue Length [veh/ln] | 4.70 | 13.53 | 11.42 | 11.16 | 14.85 | 8.98 | 8.94 | 0.65 | 17.95 | 18.40 | 24.89 | 17.36 | 14.77 |
| 95th-Percentile Queue Length [ft/ln] | 117.5 | 338.2 | 285.4 | 279.0 | 371.17 | 224.55 | 223.60 | 16.15 | 448.78 | 459.97 | 622.17 | 433.88 | 369.26 |

**Movement, Approach, & Intersection Results**

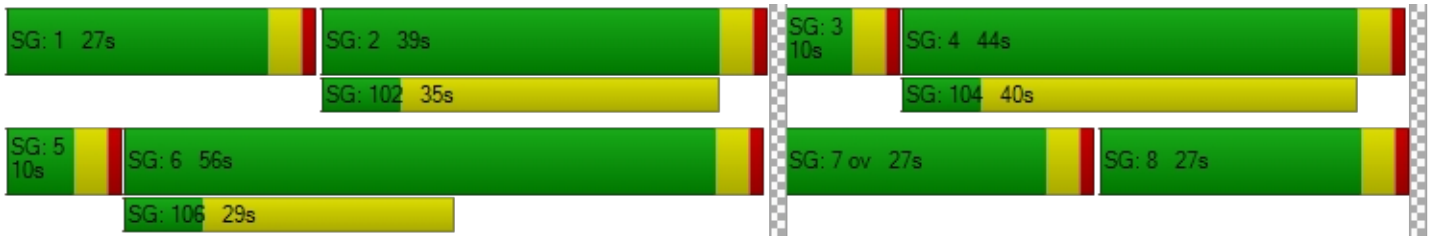
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 68.48 | 57.31 | 51.40 | 54.09 | 33.28 | 33.27 | 58.37 | 39.66 | 43.61 | 118.94 | 23.82 | 10.47 |
| Movement LOS | E | E | D | D | C | C | E | D | D | F | C | B |
| d_A, Approach Delay [s/veh] | 56.39 | | | 45.39 | | | 40.61 | | | 43.23 | | |
| Approach LOS | E | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 44.56 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.899 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.947 | 2.821 | 3.260 | 0.000 |
| Crosswalk LOS | C | C | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 383 | 666 | 583 | 866 |
| d_b, Bicycle Delay [s] | 39.22 | 26.68 | 30.12 | 19.28 |
| l_b,int, Bicycle LOS Score for Intersection | 2.296 | 2.444 | 2.310 | 3.341 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 26.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.801 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 837 | 0 | 1247 | 0 | 1571 | 580 | 199 | 1876 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 837 | 0 | 1247 | 0 | 1571 | 580 | 199 | 1876 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 0.9460 | 1.0000 | 0.9460 | 1.0000 | 0.9230 | 0.9230 | 0.9510 | 0.9510 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 221 | 0 | 330 | 0 | 426 | 157 | 52 | 493 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 885 | 0 | 1318 | 0 | 1702 | 628 | 209 | 1973 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 57 | 0 | 0 | 0 | 31 | 0 | 12 | 43 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 20 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | No | No | |
| Maximum Recall | | | | No | | | | No | | No | No | |
| Pedestrian Recall | | | | No | | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | R | C | R | L | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 100 | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 43 | 43 | 37 | 37 | 8 | 49 |
| g / C, Green / Cycle | | 0.43 | 0.43 | 0.37 | 0.37 | 0.08 | 0.49 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.25 | 0.35 | 0.30 | 0.17 | 0.06 | 0.35 |
| s, saturation flow rate [veh/h] | | 3500 | 3800 | 5700 | 3800 | 3500 | 5700 |
| c, Capacity [veh/h] | | 1508 | 1637 | 2110 | 1407 | 276 | 2788 |
| d1, Uniform Delay [s] | | 21.68 | 24.80 | 28.28 | 23.76 | 45.11 | 19.96 |
| k, delay calibration | | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 0.37 | 0.97 | 3.43 | 1.03 | 4.20 | 1.54 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.59 | 0.80 | 0.81 | 0.45 | 0.76 | 0.71 |
| d, Delay for Lane Group [s/veh] | | 22.04 | 25.77 | 31.71 | 24.79 | 49.32 | 21.50 |
| Lane Group LOS | | C | C | C | C | D | C |
| Critical Lane Group | | No | Yes | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | | 7.73 | 13.26 | 12.48 | 5.69 | 2.69 | 11.77 |
| 50th-Percentile Queue Length [ft/ln] | | 193.29 | 331.53 | 312.03 | 142.36 | 67.13 | 294.30 |
| 95th-Percentile Queue Length [veh/ln] | | 12.29 | 19.23 | 18.28 | 9.61 | 4.83 | 17.40 |
| 95th-Percentile Queue Length [ft/ln] | | 307.29 | 480.84 | 456.88 | 240.19 | 120.83 | 434.98 |

**Movement, Approach, & Intersection Results**

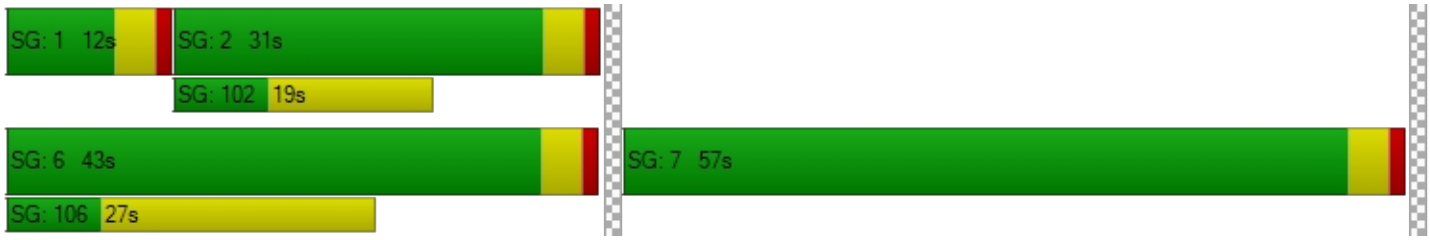
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 22.04 | 0.00 | 25.77 | 0.00 | 31.71 | 24.79 | 49.32 | 21.50 | 0.00 |
| Movement LOS | | | | C | | C | | C | C | D | C | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 24.27 | | | 29.84 | | | 24.17 | | |
| Approach LOS | A | | | C | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 26.17 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.801 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 39.61 | 39.61 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.128 | 2.673 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 1060 | 540 | 780 |
| d_b, Bicycle Delay [s] | 50.00 | 11.05 | 26.65 | 18.61 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 1.560 | 2.841 | 2.760 |
| Bicycle LOS | D | A | C | C |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 19.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.773 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | | | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | | | | No | | | No | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1104 | 0 | 467 | 0 | 0 | 0 | 0 | 1695 | 716 | 0 | 970 | 425 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1104 | 0 | 467 | 0 | 0 | 0 | 0 | 1695 | 716 | 0 | 970 | 425 |
| Peak Hour Factor | 0.9860 | 1.0000 | 0.9860 | 1.0000 | 1.0000 | 1.0000 | 0.9710 | 0.9080 | 0.9080 | 1.0000 | 0.9400 | 0.9400 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 280 | 0 | 118 | 0 | 0 | 0 | 0 | 467 | 197 | 0 | 258 | 0 |
| Total Analysis Volume [veh/h] | 1120 | 0 | 474 | 0 | 0 | 0 | 0 | 1867 | 789 | 0 | 1032 | 0 |
| Presence of On-Street Parking | No | | No | | | | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 54 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 36 | 0 |
| Vehicle Extension [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | No | | | | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | | | | | | | No | | | No | |
| Maximum Recall | No | | | | | | | No | | | No | |
| Pedestrian Recall | No | | | | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | R | | C | C | R | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 34 | 34 | | 48 | 48 | 48 | 48 |
| g / C, Green / Cycle | 0.38 | 0.38 | | 0.53 | 0.53 | 0.53 | 0.53 |
| (v / s)_i Volume / Saturation Flow Rate | 0.32 | 0.25 | | 0.35 | 0.35 | 0.35 | 0.18 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | | 3800 | 1900 | 1900 | 5700 |
| c, Capacity [veh/h] | 1319 | 716 | | 2030 | 1015 | 1015 | 3045 |
| d1, Uniform Delay [s] | 25.65 | 23.24 | | 14.99 | 14.99 | 14.99 | 11.90 |
| k, delay calibration | 0.11 | 0.11 | | 0.50 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.62 | 1.06 | | 1.66 | 3.29 | 3.29 | 0.30 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.85 | 0.66 | | 0.65 | 0.65 | 0.65 | 0.34 |
| d, Delay for Lane Group [s/veh] | 27.27 | 24.30 | | 16.65 | 18.27 | 18.27 | 12.21 |
| Lane Group LOS | C | C | | B | B | B | B |
| Critical Lane Group | Yes | No | | Yes | No | No | No |
| 50th-Percentile Queue Length [veh/ln] | 10.73 | 8.21 | | 9.41 | 9.87 | 9.87 | 3.77 |
| 50th-Percentile Queue Length [ft/ln] | 268.20 | 205.24 | | 235.34 | 246.80 | 246.80 | 94.17 |
| 95th-Percentile Queue Length [veh/ln] | 16.10 | 12.91 | | 14.45 | 15.02 | 15.02 | 6.78 |
| 95th-Percentile Queue Length [ft/ln] | 402.49 | 322.71 | | 361.13 | 375.62 | 375.62 | 169.50 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 27.27 | 0.00 | 24.30 | 0.00 | 0.00 | 0.00 | 0.00 | 16.73 | 18.27 | 0.00 | 12.21 | 0.00 |
| Movement LOS | C | | C | | | | | B | B | | B | |
| d_A, Approach Delay [s/veh] | 26.39 | | | 0.00 | | | 17.46 | | | 12.21 | | |
| Approach LOS | C | | | A | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 19.13 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.773 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 0.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.63 | 0.00 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.764 | 0.000 | 0.000 | 0.000 |
| Crosswalk LOS | C | F | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1112 | 0 | 712 | 712 |
| d_b, Bicycle Delay [s] | 8.86 | 44.96 | 18.65 | 18.65 |
| l_b,int, Bicycle LOS Score for Intersection | 1.560 | 4.132 | 3.020 | 2.127 |
| Bicycle LOS | A | D | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 19.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.512 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 102 | 77 | 183 | 56 | 38 | 80 | 89 | 701 | 128 | 160 | 849 | 26 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 102 | 77 | 183 | 56 | 38 | 80 | 89 | 701 | 128 | 160 | 849 | 26 |
| Peak Hour Factor | 0.8630 | 0.8630 | 0.8630 | 0.7790 | 0.7790 | 0.7790 | 0.9320 | 0.9320 | 0.9320 | 0.9670 | 0.9670 | 0.9670 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 30 | 22 | 53 | 18 | 12 | 26 | 24 | 188 | 34 | 41 | 219 | 7 |
| Total Analysis Volume [veh/h] | 118 | 89 | 212 | 72 | 49 | 103 | 95 | 752 | 137 | 165 | 878 | 27 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 38 | 0 | 0 | 38 | 0 | 23 | 30 | 0 | 22 | 29 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 25 | 0 | 0 | 19 | 0 | 0 | 18 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 13 | 13 | 13 | 13 | 13 | 6 | 55 | 55 | 10 | 59 | 59 |
| g / C, Green / Cycle | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.07 | 0.61 | 0.61 | 0.11 | 0.66 | 0.66 |
| (v / s)_i Volume / Saturation Flow Rate | 0.07 | 0.05 | 0.11 | 0.04 | 0.08 | 0.05 | 0.24 | 0.23 | 0.09 | 0.23 | 0.01 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 169 | 268 | 268 | 227 | 268 | 126 | 1163 | 1163 | 204 | 2490 | 1245 |
| d1, Uniform Delay [s] | 35.55 | 34.85 | 37.39 | 34.60 | 36.11 | 41.11 | 8.93 | 8.78 | 38.97 | 6.96 | 5.43 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.09 | 0.72 | 5.16 | 0.80 | 1.87 | 8.62 | 1.00 | 0.91 | 7.36 | 0.39 | 0.03 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.70 | 0.33 | 0.79 | 0.32 | 0.57 | 0.75 | 0.39 | 0.37 | 0.81 | 0.35 | 0.02 |
| d, Delay for Lane Group [s/veh] | 40.63 | 35.57 | 42.55 | 35.40 | 37.98 | 49.73 | 9.92 | 9.69 | 46.33 | 7.35 | 5.46 |
| Lane Group LOS | D | D | D | D | D | D | A | A | D | A | A |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.59 | 1.79 | 4.83 | 1.45 | 3.21 | 2.35 | 4.40 | 4.10 | 3.92 | 3.39 | 0.17 |
| 50th-Percentile Queue Length [ft/ln] | 64.73 | 44.77 | 120.63 | 36.14 | 80.35 | 58.71 | 110.12 | 102.45 | 98.11 | 84.82 | 4.18 |
| 95th-Percentile Queue Length [veh/ln] | 4.66 | 3.22 | 8.43 | 2.60 | 5.79 | 4.23 | 7.85 | 7.38 | 7.06 | 6.11 | 0.30 |
| 95th-Percentile Queue Length [ft/ln] | 116.51 | 80.59 | 210.70 | 65.06 | 144.63 | 105.67 | 196.17 | 184.41 | 176.60 | 152.68 | 7.53 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 40.63 | 35.57 | 42.55 | 35.40 | 37.98 | 37.98 | 49.73 | 9.83 | 9.69 | 46.33 | 7.35 | 5.46 |
| Movement LOS | D | D | D | D | D | D | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 40.53 | | | 37.15 | | | 13.67 | | | 13.32 | | |
| Approach LOS | D | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 19.65 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.512 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.70 | 34.70 | 34.70 | 34.70 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.318 | 2.081 | 2.873 | 2.897 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 755 | 755 | 577 | 555 |
| d_b, Bicycle Delay [s] | 17.44 | 17.44 | 22.78 | 23.49 |
| l_b,int, Bicycle LOS Score for Intersection | 2.251 | 1.929 | 2.371 | 2.442 |
| Bicycle LOS | B | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 41.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.795 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 130 | 324 | 183 | 287 | 614 | 506 | 306 | 783 | 171 | 171 | 752 | 257 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 130 | 324 | 183 | 287 | 614 | 506 | 306 | 783 | 171 | 171 | 752 | 257 |
| Peak Hour Factor | 0.9440 | 0.9440 | 0.9440 | 0.9150 | 0.9150 | 0.9150 | 0.9030 | 0.9030 | 0.9030 | 0.9260 | 0.9260 | 0.9260 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 34 | 86 | 48 | 78 | 168 | 138 | 85 | 217 | 47 | 46 | 203 | 69 |
| Total Analysis Volume [veh/h] | 138 | 343 | 194 | 314 | 671 | 553 | 339 | 867 | 189 | 185 | 812 | 278 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 10 | 39 | 0 | 27 | 56 | 0 | 17 | 42 | 0 | 12 | 37 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 37 | 37 | 13 | 44 | 44 | 13 | 46 | 46 | 8 | 41 | 41 |
| g / C, Green / Cycle | 0.05 | 0.31 | 0.31 | 0.11 | 0.37 | 0.37 | 0.11 | 0.38 | 0.38 | 0.07 | 0.34 | 0.34 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.09 | 0.10 | 0.09 | 0.34 | 0.31 | 0.10 | 0.23 | 0.10 | 0.05 | 0.21 | 0.15 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 3500 | 1900 | 1900 | 3500 | 3800 | 1900 | 3500 | 3800 | 1900 |
| c, Capacity [veh/h] | 176 | 1165 | 582 | 386 | 696 | 696 | 380 | 1455 | 728 | 235 | 1297 | 649 |
| d1, Uniform Delay [s] | 56.34 | 31.73 | 32.15 | 52.20 | 36.47 | 34.68 | 52.80 | 29.60 | 25.37 | 55.16 | 33.10 | 30.49 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.31 | 0.25 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 7.39 | 0.14 | 0.33 | 4.21 | 14.00 | 5.94 | 7.34 | 1.80 | 0.87 | 5.84 | 2.29 | 2.06 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.78 | 0.29 | 0.33 | 0.81 | 0.93 | 0.83 | 0.89 | 0.60 | 0.26 | 0.79 | 0.63 | 0.43 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 63.73 | 31.87 | 32.48 | 56.41 | 50.47 | 40.62 | 60.15 | 31.41 | 26.24 | 60.99 | 35.39 | 32.56 |
| Lane Group LOS | E | C | C | E | D | D | E | C | C | E | D | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 2.25 | 3.84 | 4.42 | 4.84 | 20.48 | 16.36 | 5.42 | 10.30 | 3.89 | 2.95 | 10.26 | 6.58 |
| 50th-Percentile Queue Length [ft/ln] | 56.21 | 95.89 | 110.61 | 121.12 | 512.05 | 408.89 | 135.61 | 257.42 | 97.16 | 73.67 | 256.49 | 164.56 |
| 95th-Percentile Queue Length [veh/ln] | 4.05 | 6.90 | 7.87 | 8.45 | 27.90 | 22.99 | 9.24 | 15.56 | 7.00 | 5.30 | 15.51 | 10.79 |
| 95th-Percentile Queue Length [ft/ln] | 101.17 | 172.61 | 196.85 | 211.37 | 697.61 | 574.70 | 231.10 | 388.98 | 174.89 | 132.60 | 387.82 | 269.75 |

**Movement, Approach, & Intersection Results**

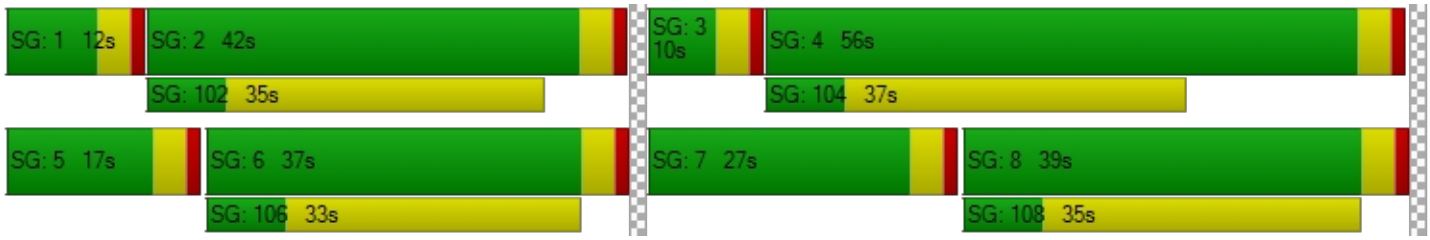
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 63.73 | 31.87 | 32.48 | 56.41 | 50.08 | 40.62 | 60.15 | 31.41 | 26.24 | 60.99 | 35.39 | 32.56 |
| Movement LOS | E | C | C | E | D | D | E | C | C | E | D | C |
| d_A, Approach Delay [s/veh] | 38.56 | | | 47.97 | | | 37.69 | | | 38.49 | | |
| Approach LOS | D | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 41.26 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.795 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.51 | 49.51 | 49.51 | 49.51 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.847 | 2.873 | 3.011 | 2.977 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 583 | 867 | 633 | 550 |
| d_b, Bicycle Delay [s] | 30.11 | 19.27 | 28.02 | 31.54 |
| l_b,int, Bicycle LOS Score for Intersection | 2.116 | 2.828 | 2.710 | 2.611 |
| Bicycle LOS | B | C | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 21.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.608 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 341 | 20 | 166 | 12 | 22 | 16 | 10 | 814 | 353 | 148 | 806 | 14 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 341 | 20 | 166 | 12 | 22 | 16 | 10 | 814 | 353 | 148 | 806 | 14 |
| Peak Hour Factor | 0.9600 | 0.9600 | 0.9600 | 0.7170 | 0.7170 | 0.7170 | 0.9350 | 0.9350 | 0.9350 | 0.9260 | 0.9260 | 0.9260 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 89 | 5 | 43 | 4 | 8 | 6 | 3 | 218 | 94 | 40 | 218 | 4 |
| Total Analysis Volume [veh/h] | 355 | 21 | 173 | 17 | 31 | 22 | 11 | 871 | 378 | 160 | 870 | 15 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 110 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 6 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 30 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 24 | 61 | 61 | 0 | 37 | 0 | 10 | 38 | 0 | 11 | 39 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 7 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 26 | 0 | 26 | 0 | 0 | 27 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | No | | No | | No | No | | No | No | |
| Maximum Recall | No | No | No | | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | No | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 14 | 23 | 34 | 5 | 5 | 2 | 68 | 68 | 7 | 73 | 73 |
| g / C, Green / Cycle | 0.12 | 0.21 | 0.31 | 0.05 | 0.05 | 0.02 | 0.62 | 0.62 | 0.06 | 0.67 | 0.67 |
| (v / s)_i Volume / Saturation Flow Rate | 0.10 | 0.01 | 0.09 | 0.01 | 0.03 | 0.01 | 0.34 | 0.31 | 0.05 | 0.23 | 0.23 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 |
| c, Capacity [veh/h] | 431 | 396 | 586 | 108 | 92 | 29 | 1176 | 1176 | 224 | 1267 | 1267 |
| d1, Uniform Delay [s] | 47.07 | 34.89 | 28.95 | 50.28 | 51.24 | 53.59 | 12.20 | 11.63 | 50.52 | 7.98 | 7.96 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 3.99 | 0.06 | 0.28 | 0.68 | 5.52 | 7.97 | 1.91 | 1.55 | 4.20 | 0.76 | 0.76 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.82 | 0.05 | 0.30 | 0.16 | 0.57 | 0.38 | 0.56 | 0.51 | 0.71 | 0.35 | 0.35 |
| d, Delay for Lane Group [s/veh] | 51.07 | 34.94 | 29.22 | 50.96 | 56.76 | 61.56 | 14.11 | 13.19 | 54.71 | 8.74 | 8.72 |
| Lane Group LOS | D | C | C | D | E | E | B | B | D | A | A |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 4.96 | 0.46 | 3.52 | 0.47 | 1.57 | 0.37 | 9.37 | 8.07 | 2.29 | 4.49 | 4.45 |
| 50th-Percentile Queue Length [ft/ln] | 124.09 | 11.47 | 88.05 | 11.75 | 39.25 | 9.13 | 234.22 | 201.74 | 57.19 | 112.17 | 111.30 |
| 95th-Percentile Queue Length [veh/ln] | 8.62 | 0.83 | 6.34 | 0.85 | 2.83 | 0.66 | 14.39 | 12.73 | 4.12 | 7.96 | 7.91 |
| 95th-Percentile Queue Length [ft/ln] | 215.44 | 20.65 | 158.48 | 21.15 | 70.65 | 16.43 | 359.71 | 318.21 | 102.94 | 199.02 | 197.80 |

**Movement, Approach, & Intersection Results**

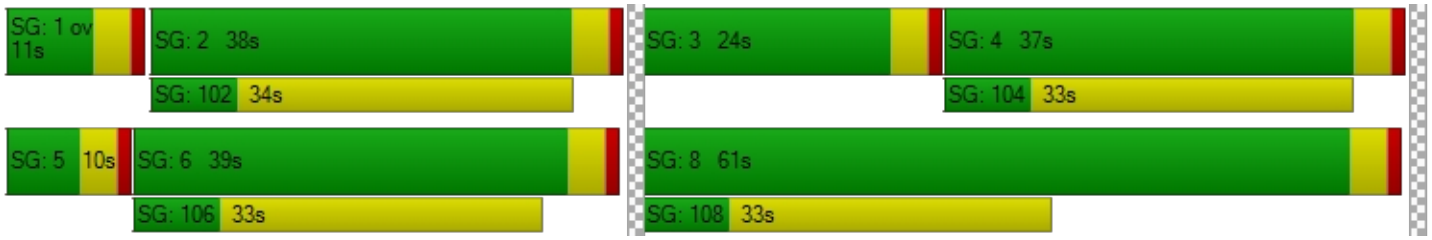
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 51.07 | 34.94 | 29.22 | 50.96 | 56.76 | 56.76 | 61.56 | 13.88 | 13.19 | 54.71 | 8.73 | 8.72 |
| Movement LOS | D | C | C | D | E | E | E | B | B | D | A | A |
| d_A, Approach Delay [s/veh] | 43.57 | | | 55.35 | | | 14.09 | | | 15.77 | | |
| Approach LOS | D | | | E | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 21.21 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.608 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 44.56 | 44.56 | 44.56 | 44.56 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.644 | 1.988 | 2.798 | 2.829 |
| Crosswalk LOS | B | A | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1036 | 600 | 618 | 636 |
| d_b, Bicycle Delay [s] | 12.78 | 26.96 | 26.27 | 25.58 |
| l_b,int, Bicycle LOS Score for Intersection | 2.465 | 1.675 | 2.599 | 2.422 |
| Bicycle LOS | B | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 20.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.257 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 22 | 291 | 115 | 72 | 276 | 24 | 38 | 11 | 60 | 83 | 4 | 59 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 22 | 291 | 115 | 72 | 276 | 24 | 38 | 11 | 60 | 83 | 4 | 59 |
| Peak Hour Factor | 0.9200 | 0.9200 | 0.9200 | 0.9030 | 0.9030 | 0.9030 | 0.6380 | 0.6380 | 0.6380 | 0.9310 | 0.9310 | 0.9310 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 6 | 79 | 31 | 20 | 76 | 7 | 15 | 4 | 24 | 22 | 1 | 16 |
| Total Analysis Volume [veh/h] | 24 | 316 | 125 | 80 | 306 | 27 | 60 | 17 | 94 | 89 | 4 | 63 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 26 | 0 | 10 | 26 | 0 | 0 | 54 | 0 | 0 | 54 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 12 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | L | C | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 3 | 65 | 65 | 5 | 68 | 68 | 7 | 7 | 7 | 7 |
| g / C, Green / Cycle | 0.03 | 0.73 | 0.73 | 0.06 | 0.75 | 0.75 | 0.08 | 0.08 | 0.08 | 0.08 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.12 | 0.11 | 0.04 | 0.09 | 0.09 | 0.03 | 0.06 | 0.05 | 0.04 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 56 | 1378 | 1378 | 106 | 1430 | 1430 | 135 | 157 | 93 | 157 |
| d1, Uniform Delay [s] | 42.82 | 3.87 | 3.83 | 41.74 | 3.02 | 3.02 | 39.18 | 40.23 | 39.85 | 39.26 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.01 | 0.26 | 0.24 | 10.43 | 0.17 | 0.16 | 2.28 | 5.68 | 32.81 | 1.82 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.43 | 0.17 | 0.15 | 0.76 | 0.12 | 0.12 | 0.44 | 0.71 | 0.95 | 0.43 |
|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 47.83 | 4.13 | 4.07 | 52.17 | 3.19 | 3.18 | 41.46 | 45.90 | 72.66 | 41.08 |
| Lane Group LOS | D | A | A | D | A | A | D | D | E | D |
| Critical Lane Group | No | Yes | No | Yes | No | No | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.60 | 1.13 | 1.04 | 2.04 | 0.67 | 0.66 | 1.33 | 2.61 | 2.73 | 1.47 |
| 50th-Percentile Queue Length [ft/ln] | 14.95 | 28.24 | 26.00 | 50.92 | 16.78 | 16.43 | 33.27 | 65.33 | 68.26 | 36.82 |
| 95th-Percentile Queue Length [veh/ln] | 1.08 | 2.03 | 1.87 | 3.67 | 1.21 | 1.18 | 2.40 | 4.70 | 4.91 | 2.65 |
| 95th-Percentile Queue Length [ft/ln] | 26.91 | 50.83 | 46.79 | 91.65 | 30.20 | 29.57 | 59.88 | 117.59 | 122.86 | 66.28 |

**Movement, Approach, & Intersection Results**

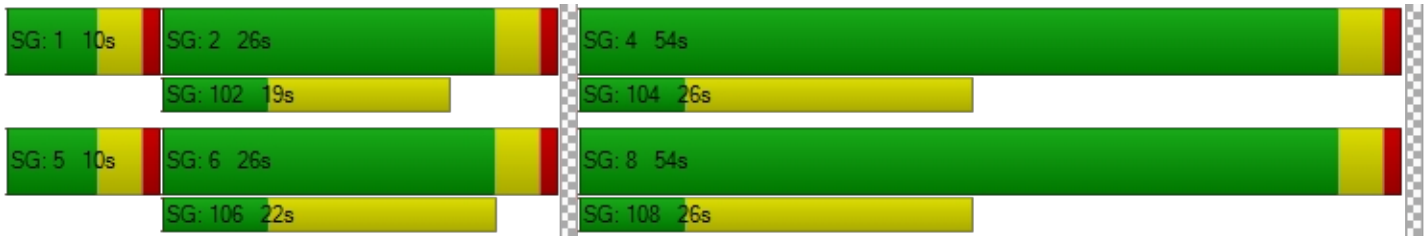
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 47.83 | 4.11 | 4.07 | 52.17 | 3.19 | 3.18 | 41.46 | 45.90 | 45.90 | 72.66 | 41.08 | 41.08 |
| Movement LOS | D | A | A | D | A | A | D | D | D | E | D | D |
| d_A, Approach Delay [s/veh] | 6.35 | | | 12.68 | | | 44.35 | | | 59.10 | | |
| Approach LOS | A | | | B | | | D | | | E | | |
| d_I, Intersection Delay [s/veh] | 20.74 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.257 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.612 | 2.551 | 2.013 | 2.063 |
| Crosswalk LOS | B | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 489 | 489 | 1111 | 1111 |
| d_b, Bicycle Delay [s] | 25.70 | 25.70 | 8.90 | 8.90 |
| l_b,int, Bicycle LOS Score for Intersection | 1.943 | 1.900 | 1.842 | 1.817 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 23.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.486 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 23 | 352 | 431 | 43 | 320 | 22 | 25 | 15 | 27 | 395 | 6 | 78 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 23 | 352 | 431 | 43 | 320 | 22 | 25 | 15 | 27 | 395 | 6 | 78 |
| Peak Hour Factor | 0.9560 | 0.9560 | 0.9560 | 0.8510 | 0.8510 | 0.8510 | 0.8970 | 0.8970 | 0.8970 | 0.8690 | 0.8690 | 0.8690 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 6 | 92 | 113 | 13 | 94 | 6 | 7 | 4 | 8 | 114 | 2 | 22 |
| Total Analysis Volume [veh/h] | 24 | 368 | 451 | 51 | 376 | 26 | 28 | 17 | 30 | 455 | 7 | 90 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 105 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 28 | 0 | 11 | 29 | 0 | 0 | 30 | 0 | 0 | 36 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 17 | 0 | 0 | 18 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | C | R | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 0.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 69 | 60 | 60 | 69 | 61 | 61 | 5 | 5 | 19 | 19 |
| g / C, Green / Cycle | 0.65 | 0.57 | 0.57 | 0.65 | 0.58 | 0.58 | 0.05 | 0.05 | 0.18 | 0.18 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.19 | 0.24 | 0.03 | 0.11 | 0.10 | 0.03 | 0.02 | 0.16 | 0.14 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 1171 | 1079 | 1079 | 1013 | 1108 | 1108 | 93 | 98 | 329 | 347 |
| d1, Uniform Delay [s] | 6.48 | 12.17 | 12.87 | 6.58 | 10.21 | 10.19 | 48.48 | 48.02 | 41.59 | 40.93 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.01 | 0.86 | 1.19 | 0.09 | 0.36 | 0.36 | 3.85 | 1.73 | 6.31 | 3.81 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.02 | 0.34 | 0.42 | 0.05 | 0.18 | 0.18 | 0.48 | 0.31 | 0.85 | 0.78 |
| d, Delay for Lane Group [s/veh] | 6.49 | 13.03 | 14.06 | 6.67 | 10.58 | 10.55 | 52.33 | 49.76 | 47.90 | 44.74 |
| Lane Group LOS | A | B | B | A | B | B | D | D | D | D |
| Critical Lane Group | No | No | Yes | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.18 | 4.68 | 6.09 | 0.41 | 2.21 | 2.17 | 1.24 | 0.80 | 7.57 | 6.99 |
| 50th-Percentile Queue Length [ft/ln] | 4.48 | 116.99 | 152.17 | 10.20 | 55.18 | 54.18 | 31.11 | 20.08 | 189.14 | 174.81 |
| 95th-Percentile Queue Length [veh/ln] | 0.32 | 8.23 | 10.13 | 0.73 | 3.97 | 3.90 | 2.24 | 1.45 | 12.08 | 11.33 |
| 95th-Percentile Queue Length [ft/ln] | 8.06 | 205.68 | 253.32 | 18.37 | 99.33 | 97.52 | 55.99 | 36.15 | 301.91 | 283.22 |

**Movement, Approach, & Intersection Results**

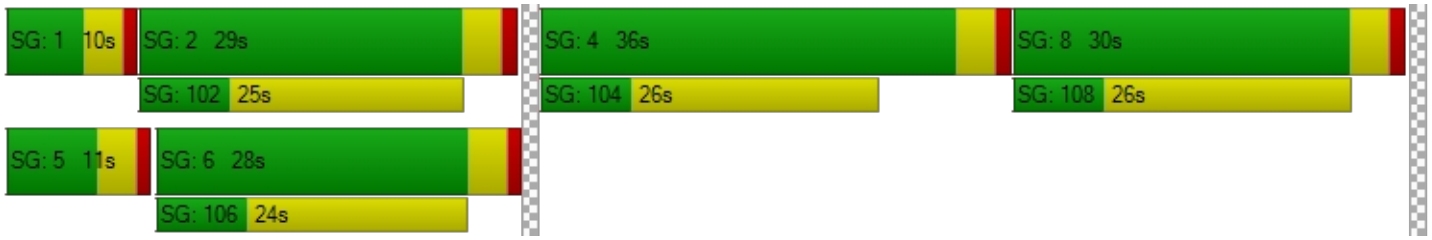
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 6.49 | 13.03 | 14.06 | 6.67 | 10.57 | 10.55 | 52.33 | 52.33 | 49.76 | 46.69 | 44.74 | 44.74 |
| Movement LOS | A | B | B | A | B | B | D | D | D | D | D | D |
| d_A, Approach Delay [s/veh] | 13.39 | | | 10.13 | | | 51.30 | | | 46.35 | | |
| Approach LOS | B | | | B | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 23.56 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.486 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 42.11 | 42.11 | 42.11 | 42.11 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.639 | 2.490 | 2.011 | 2.338 |
| Crosswalk LOS | B | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 457 | 476 | 495 | 609 |
| d_b, Bicycle Delay [s] | 31.27 | 30.50 | 29.75 | 25.40 |
| l_b,int, Bicycle LOS Score for Intersection | 2.255 | 1.933 | 1.683 | 2.470 |
| Bicycle LOS | B | A | A | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 32.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.829 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 175 | 32 | 94 | 62 | 28 | 529 | 677 | 407 | 30 | 89 | 642 | 36 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 175 | 32 | 94 | 62 | 28 | 529 | 677 | 407 | 30 | 89 | 642 | 36 |
| Peak Hour Factor | 0.8300 | 0.8300 | 0.8300 | 0.8970 | 0.8970 | 0.8970 | 0.9440 | 0.9440 | 0.9440 | 0.8860 | 0.8860 | 0.8860 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 53 | 10 | 28 | 17 | 8 | 147 | 179 | 108 | 8 | 25 | 181 | 10 |
| Total Analysis Volume [veh/h] | 211 | 39 | 113 | 69 | 31 | 590 | 717 | 431 | 32 | 100 | 725 | 41 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 6 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 30 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 37 | 0 | 0 | 12 | 12 | 39 | 31 | 0 | 40 | 32 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 21 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | No | No | No | | No | No | |
| Maximum Recall | | No | | | No | No | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | No | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | C | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 13 | 13 | 13 | 8 | 8 | 60 | 31 | 75 | 75 | 8 | 52 | 52 |
| g / C, Green / Cycle | 0.11 | 0.11 | 0.11 | 0.07 | 0.07 | 0.50 | 0.26 | 0.62 | 0.62 | 0.07 | 0.43 | 0.43 |
| (v / s)_i Volume / Saturation Flow Rate | 0.05 | 0.09 | 0.06 | 0.04 | 0.02 | 0.31 | 0.20 | 0.12 | 0.12 | 0.06 | 0.20 | 0.20 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 1900 | 1900 |
| c, Capacity [veh/h] | 223 | 242 | 200 | 121 | 128 | 951 | 913 | 1184 | 1184 | 128 | 823 | 823 |
| d1, Uniform Delay [s] | 50.71 | 52.56 | 51.07 | 54.30 | 53.08 | 21.73 | 41.24 | 9.73 | 9.70 | 54.86 | 24.23 | 24.12 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.29 | 2.81 | 2.48 | 4.15 | 0.97 | 3.04 | 1.53 | 0.37 | 0.36 | 9.95 | 1.92 | 1.86 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.43 | 0.64 | 0.56 | 0.57 | 0.24 | 0.62 | 0.79 | 0.20 | 0.19 | 0.78 | 0.47 | 0.46 |
| d, Delay for Lane Group [s/veh] | 52.00 | 55.37 | 53.55 | 58.45 | 54.05 | 24.78 | 42.77 | 10.11 | 10.07 | 64.81 | 26.15 | 25.97 |
| Lane Group LOS | D | E | D | E | D | C | D | B | B | E | C | C |
| Critical Lane Group | No | Yes | No | No | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 2.78 | 4.76 | 3.37 | 2.16 | 0.92 | 12.59 | 10.00 | 2.71 | 2.64 | 3.33 | 8.22 | 8.02 |
| 50th-Percentile Queue Length [ft/ln] | 69.45 | 118.94 | 84.32 | 54.12 | 23.10 | 314.67 | 250.12 | 67.75 | 65.97 | 83.22 | 205.43 | 200.57 |
| 95th-Percentile Queue Length [veh/ln] | 5.00 | 8.33 | 6.07 | 3.90 | 1.66 | 18.41 | 15.19 | 4.88 | 4.75 | 5.99 | 12.92 | 12.67 |
| 95th-Percentile Queue Length [ft/ln] | 125.01 | 208.37 | 151.78 | 97.42 | 41.57 | 460.13 | 379.80 | 121.95 | 118.74 | 149.79 | 322.96 | 316.70 |

**Movement, Approach, & Intersection Results**

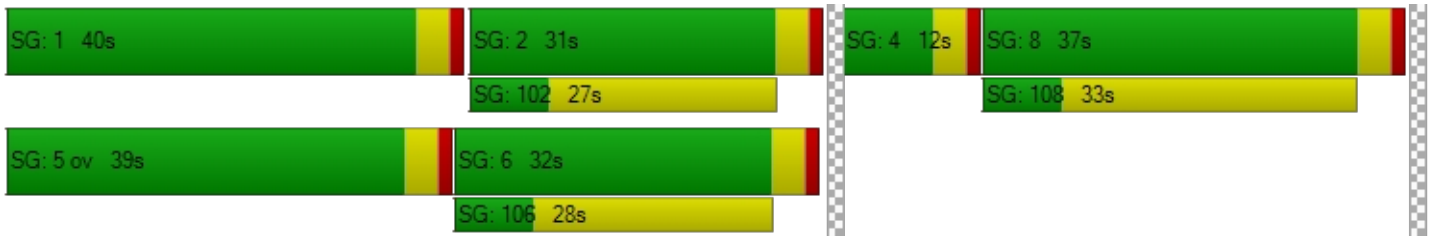
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 53.78 | 55.37 | 53.55 | 58.45 | 54.05 | 24.78 | 42.77 | 10.09 | 10.07 | 64.81 | 26.07 | 25.97 |
| Movement LOS | D | E | D | E | D | C | D | B | B | E | C | C |
| d_A, Approach Delay [s/veh] | 53.92 | | | 29.46 | | | 29.95 | | | 30.54 | | |
| Approach LOS | D | | | C | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 32.81 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.829 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 0.00 | 49.52 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.416 | 2.604 | 0.000 | 2.602 |
| Crosswalk LOS | B | B | F | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 550 | 133 | 450 | 467 |
| d_b, Bicycle Delay [s] | 31.55 | 52.28 | 36.05 | 35.28 |
| l_b,int, Bicycle LOS Score for Intersection | 2.159 | 2.129 | 2.533 | 2.274 |
| Bicycle LOS | B | B | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 39.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.757 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 357 | 800 | 192 | 234 | 827 | 303 | 353 | 1216 | 283 | 350 | 1314 | 220 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 357 | 800 | 192 | 234 | 827 | 303 | 353 | 1216 | 283 | 350 | 1314 | 220 |
| Peak Hour Factor | 0.9070 | 0.9070 | 0.9070 | 0.9640 | 0.9640 | 0.9640 | 0.9710 | 0.9710 | 0.9710 | 0.9600 | 0.9600 | 0.9600 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 98 | 221 | 53 | 61 | 214 | 79 | 91 | 313 | 73 | 91 | 342 | 57 |
| Total Analysis Volume [veh/h] | 394 | 882 | 212 | 243 | 858 | 314 | 364 | 1252 | 291 | 365 | 1369 | 229 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 20 | 45 | 0 | 14 | 39 | 0 | 19 | 42 | 0 | 19 | 42 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 31 | 0 | 0 | 28 | 0 | 0 | 31 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 15 | 30 | 30 | 10 | 24 | 24 | 14 | 50 | 50 | 14 | 50 | 50 |
| g / C, Green / Cycle | 0.13 | 0.25 | 0.25 | 0.08 | 0.20 | 0.20 | 0.12 | 0.41 | 0.41 | 0.12 | 0.42 | 0.42 |
| (v / s)_i Volume / Saturation Flow Rate | 0.11 | 0.15 | 0.11 | 0.07 | 0.15 | 0.17 | 0.10 | 0.27 | 0.26 | 0.10 | 0.24 | 0.12 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 452 | 1410 | 470 | 296 | 1157 | 386 | 422 | 1573 | 787 | 423 | 2361 | 787 |
| d1, Uniform Delay [s] | 51.34 | 40.24 | 38.29 | 54.09 | 44.91 | 45.71 | 51.84 | 28.42 | 28.01 | 51.83 | 27.12 | 23.43 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.13 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.39 | 0.46 | 0.68 | 5.64 | 0.96 | 5.10 | 5.33 | 2.21 | 3.92 | 5.34 | 1.05 | 0.94 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.87 | 0.63 | 0.45 | 0.82 | 0.74 | 0.81 | 0.86 | 0.66 | 0.64 | 0.86 | 0.58 | 0.29 |
| d, Delay for Lane Group [s/veh] | 56.73 | 40.70 | 38.96 | 59.73 | 45.87 | 50.81 | 57.17 | 30.63 | 31.93 | 57.17 | 28.17 | 24.37 |
| Lane Group LOS | E | D | D | E | D | D | E | C | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 6.15 | 7.79 | 5.39 | 3.84 | 8.08 | 9.46 | 5.69 | 12.42 | 12.17 | 5.70 | 10.21 | 4.53 |
| 50th-Percentile Queue Length [ft/ln] | 153.73 | 194.63 | 134.71 | 96.10 | 202.04 | 236.54 | 142.17 | 310.60 | 304.15 | 142.58 | 255.28 | 113.31 |
| 95th-Percentile Queue Length [veh/ln] | 10.22 | 12.36 | 9.20 | 6.92 | 12.74 | 14.51 | 9.60 | 18.20 | 17.89 | 9.62 | 15.45 | 8.02 |
| 95th-Percentile Queue Length [ft/ln] | 255.40 | 309.03 | 229.89 | 172.99 | 318.60 | 362.66 | 239.95 | 455.11 | 447.16 | 240.49 | 386.30 | 200.60 |

**Movement, Approach, & Intersection Results**

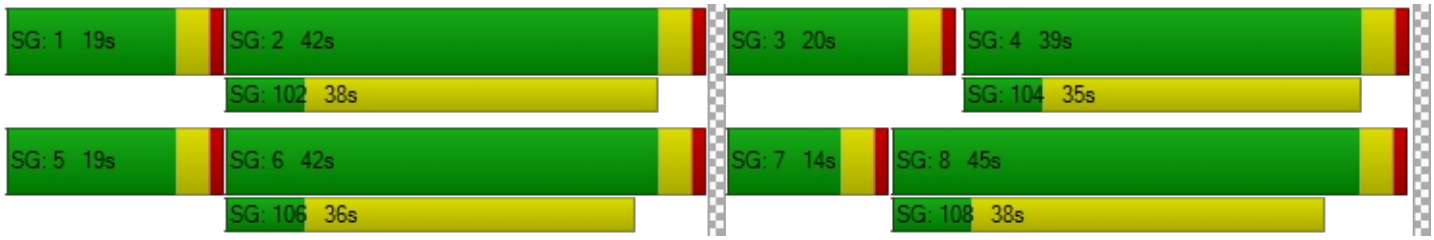
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 56.73 | 40.70 | 38.96 | 59.73 | 45.87 | 50.81 | 57.17 | 30.85 | 31.93 | 57.17 | 28.17 | 24.37 |
| Movement LOS | E | D | D | E | D | D | E | C | C | E | C | C |
| d_A, Approach Delay [s/veh] | 44.70 | | | 49.35 | | | 36.04 | | | 33.12 | | |
| Approach LOS | D | | | D | | | D | | | C | | |
| d_I, Intersection Delay [s/veh] | 39.88 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.757 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.188 | 3.176 | 3.225 | 3.261 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 683 | 583 | 633 | 633 |
| d_b, Bicycle Delay [s] | 26.03 | 30.13 | 28.04 | 28.04 |
| l_b,int, Bicycle LOS Score for Intersection | 2.378 | 2.338 | 2.608 | 2.639 |
| Bicycle LOS | B | B | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 14.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.512 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 27 | 31 | 97 | 164 | 44 | 128 | 82 | 1392 | 37 | 80 | 1451 | 189 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 27 | 31 | 97 | 164 | 44 | 128 | 82 | 1392 | 37 | 80 | 1451 | 189 |
| Peak Hour Factor | 0.8200 | 0.8200 | 0.8200 | 0.7710 | 0.7710 | 0.7710 | 0.9890 | 0.9890 | 0.9890 | 0.9120 | 0.9120 | 0.9120 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 8 | 9 | 30 | 53 | 14 | 42 | 21 | 352 | 9 | 22 | 398 | 52 |
| Total Analysis Volume [veh/h] | 33 | 38 | 118 | 213 | 57 | 166 | 83 | 1407 | 37 | 88 | 1591 | 207 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 40 | 0 | 0 | 40 | 0 | 10 | 37 | 0 | 13 | 40 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 23 | 0 | 0 | 17 | 0 | 0 | 23 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 13 | 13 | 13 | 13 | 13 | 13 | 5 | 59 | 59 | 6 | 59 | 59 |
| g / C, Green / Cycle | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.06 | 0.66 | 0.66 | 0.06 | 0.66 | 0.66 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.02 | 0.06 | 0.12 | 0.02 | 0.09 | 0.05 | 0.25 | 0.26 | 0.05 | 0.28 | 0.11 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 289 | 280 | 280 | 281 | 559 | 280 | 110 | 2489 | 1244 | 117 | 3754 | 1251 |
| d1, Uniform Delay [s] | 33.38 | 33.44 | 34.94 | 37.16 | 33.27 | 35.90 | 41.62 | 7.16 | 7.24 | 41.43 | 7.29 | 5.90 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.17 | 0.22 | 1.01 | 4.18 | 0.08 | 2.01 | 9.93 | 0.45 | 0.95 | 9.45 | 0.35 | 0.28 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.11 | 0.14 | 0.42 | 0.76 | 0.10 | 0.59 | 0.75 | 0.38 | 0.40 | 0.75 | 0.42 | 0.17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 33.55 | 33.65 | 35.95 | 41.35 | 33.34 | 37.91 | 51.56 | 7.60 | 8.19 | 50.88 | 7.64 | 6.18 |
| Lane Group LOS | C | C | D | D | C | D | D | A | A | D | A | A |
| Critical Lane Group | No | No | No | Yes | No | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.63 | 0.73 | 2.40 | 4.79 | 0.54 | 3.51 | 2.10 | 3.78 | 4.13 | 2.21 | 4.26 | 1.41 |
| 50th-Percentile Queue Length [ft/ln] | 15.86 | 18.32 | 60.03 | 119.65 | 13.51 | 87.85 | 52.46 | 94.46 | 103.27 | 55.15 | 106.47 | 35.13 |
| 95th-Percentile Queue Length [veh/ln] | 1.14 | 1.32 | 4.32 | 8.37 | 0.97 | 6.33 | 3.78 | 6.80 | 7.44 | 3.97 | 7.64 | 2.53 |
| 95th-Percentile Queue Length [ft/ln] | 28.55 | 32.98 | 108.05 | 209.35 | 24.31 | 158.13 | 94.42 | 170.03 | 185.88 | 99.26 | 191.08 | 63.23 |

**Movement, Approach, & Intersection Results**

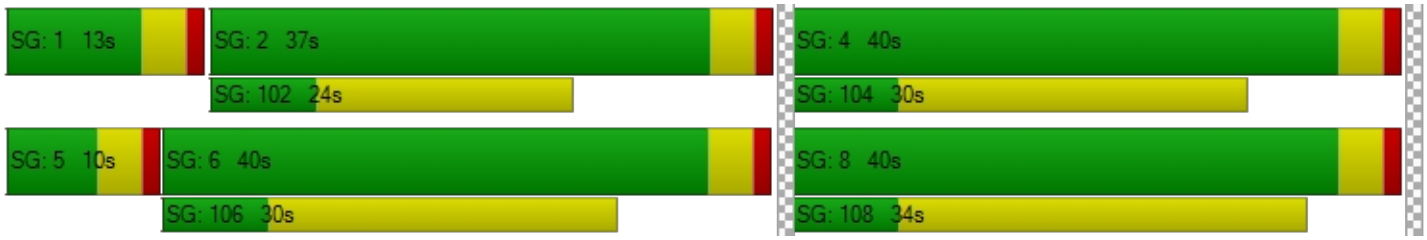
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 33.55 | 33.65 | 35.95 | 41.35 | 33.34 | 37.91 | 51.56 | 7.79 | 8.19 | 50.88 | 7.64 | 6.18 |
| Movement LOS | C | C | D | D | C | D | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 35.07 | | | 38.99 | | | 10.18 | | | 9.50 | | |
| Approach LOS | D | | | D | | | B | | | A | | |
| d_I, Intersection Delay [s/veh] | 14.14 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.512 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.70 | 34.70 | 34.70 | 34.70 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.372 | 2.448 | 3.102 | 3.470 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 800 | 800 | 733 | 800 |
| d_b, Bicycle Delay [s] | 16.22 | 16.22 | 18.07 | 16.22 |
| l_b,int, Bicycle LOS Score for Intersection | 1.871 | 1.919 | 2.399 | 2.597 |
| Bicycle LOS | A | A | B | B |

## Sequence

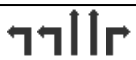
| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 48.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.920 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 437 | 574 | 287 | 467 | 933 | 253 | 274 | 1440 | 288 | 367 | 1400 | 414 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 437 | 574 | 287 | 467 | 933 | 253 | 274 | 1440 | 288 | 367 | 1400 | 414 |
| Peak Hour Factor | 0.9240 | 0.9240 | 0.9240 | 0.9170 | 0.9170 | 0.9170 | 0.9130 | 0.9130 | 0.9130 | 0.8900 | 0.8900 | 0.8900 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 118 | 155 | 78 | 127 | 254 | 69 | 75 | 394 | 79 | 103 | 393 | 116 |
| Total Analysis Volume [veh/h] | 473 | 621 | 311 | 509 | 1017 | 276 | 300 | 1577 | 315 | 412 | 1573 | 465 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 21 | 41 | 0 | 21 | 41 | 0 | 15 | 41 | 0 | 17 | 43 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 17 | 35 | 35 | 17 | 35 | 35 | 11 | 39 | 39 | 13 | 41 | 41 |
| g / C, Green / Cycle | 0.14 | 0.29 | 0.29 | 0.14 | 0.29 | 0.29 | 0.09 | 0.33 | 0.33 | 0.11 | 0.34 | 0.34 |
| (v / s)_i Volume / Saturation Flow Rate | 0.14 | 0.11 | 0.16 | 0.15 | 0.27 | 0.15 | 0.09 | 0.28 | 0.17 | 0.12 | 0.28 | 0.24 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 497 | 1651 | 550 | 497 | 1101 | 550 | 323 | 1859 | 620 | 381 | 1954 | 651 |
| d1, Uniform Delay [s] | 51.10 | 33.99 | 36.22 | 51.51 | 41.36 | 35.44 | 54.11 | 37.68 | 32.67 | 53.50 | 35.81 | 34.33 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 10.41 | 0.14 | 0.95 | 25.15 | 3.86 | 0.71 | 11.60 | 5.03 | 2.96 | 47.25 | 3.65 | 6.56 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.95 | 0.38 | 0.57 | 1.02 | 0.92 | 0.50 | 0.93 | 0.85 | 0.51 | 1.08 | 0.80 | 0.71 |
| d, Delay for Lane Group [s/veh] | 61.51 | 34.14 | 37.17 | 76.66 | 45.22 | 36.15 | 65.71 | 42.71 | 35.63 | 100.75 | 39.46 | 40.89 |
| Lane Group LOS | E | C | D | F | D | D | E | D | D | F | D | D |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 7.75 | 4.85 | 7.87 | 9.19 | 15.02 | 6.82 | 5.01 | 15.10 | 7.91 | 8.24 | 14.44 | 12.90 |
| 50th-Percentile Queue Length [ft/ln] | 193.86 | 121.24 | 196.84 | 229.72 | 375.49 | 170.48 | 125.35 | 377.48 | 197.63 | 205.88 | 361.05 | 322.59 |
| 95th-Percentile Queue Length [veh/ln] | 12.32 | 8.46 | 12.48 | 14.31 | 21.38 | 11.10 | 8.69 | 21.47 | 12.52 | 13.34 | 20.67 | 18.79 |
| 95th-Percentile Queue Length [ft/ln] | 308.03 | 211.54 | 311.88 | 357.83 | 534.39 | 277.55 | 217.16 | 536.80 | 312.90 | 333.61 | 516.86 | 469.87 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 61.51 | 34.14 | 37.17 | 76.66 | 45.22 | 36.15 | 65.71 | 42.71 | 35.63 | 100.75 | 39.46 | 40.89 |
| Movement LOS | E | C | D | F | D | D | E | D | D | F | D | D |
| d_A, Approach Delay [s/veh] | 44.02 | | | 52.71 | | | 44.84 | | | 50.04 | | |
| Approach LOS | D | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 48.12 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.920 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 49.52 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.123 | 3.128 | 3.352 | 3.388 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 617 | 617 | 617 | 650 |
| d_b, Bicycle Delay [s] | 28.72 | 28.72 | 28.72 | 27.35 |
| l_b,int, Bicycle LOS Score for Intersection | 2.332 | 3.046 | 2.765 | 2.907 |
| Bicycle LOS | B | C | C | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 45.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.906 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 102 | 47 | 199 | 420 | 86 | 299 | 322 | 1626 | 65 | 142 | 1880 | 473 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 102 | 47 | 199 | 420 | 86 | 299 | 322 | 1626 | 65 | 142 | 1880 | 473 |
| Peak Hour Factor | 0.8250 | 0.8250 | 0.8250 | 0.9010 | 0.9010 | 0.9010 | 0.9400 | 0.9400 | 0.9400 | 0.9820 | 0.9820 | 0.9820 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 31 | 14 | 60 | 117 | 24 | 83 | 86 | 432 | 17 | 36 | 479 | 120 |
| Total Analysis Volume [veh/h] | 124 | 57 | 241 | 466 | 95 | 332 | 343 | 1730 | 69 | 145 | 1914 | 482 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 14 | 0 | 0 | 41 | 0 | 17 | 50 | 0 | 15 | 48 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 28 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 17 | 17 | 17 | 30 | 30 | 13 | 46 | 46 | 11 | 44 | 44 |
| g / C, Green / Cycle | 0.14 | 0.14 | 0.14 | 0.25 | 0.25 | 0.11 | 0.38 | 0.38 | 0.09 | 0.37 | 0.37 |
| (v / s)_i Volume / Saturation Flow Rate | 0.07 | 0.03 | 0.13 | 0.13 | 0.22 | 0.10 | 0.31 | 0.32 | 0.08 | 0.34 | 0.25 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 3500 | 1900 | 3500 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 250 | 250 | 264 | 879 | 477 | 383 | 1459 | 729 | 167 | 2094 | 698 |
| d1, Uniform Delay [s] | 47.83 | 45.99 | 51.01 | 38.84 | 43.43 | 52.82 | 33.15 | 33.67 | 53.76 | 36.20 | 32.22 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.26 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.52 | 0.46 | 11.89 | 0.50 | 12.98 | 7.57 | 5.06 | 11.27 | 12.62 | 7.65 | 5.54 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.50 | 0.23 | 0.91 | 0.53 | 0.89 | 0.90 | 0.81 | 0.84 | 0.87 | 0.91 | 0.69 |
| d, Delay for Lane Group [s/veh] | 49.35 | 46.45 | 62.89 | 39.34 | 56.41 | 60.39 | 38.21 | 44.94 | 66.39 | 43.84 | 37.75 |
| Lane Group LOS | D | D | E | D | E | E | D | D | E | D | D |
| Critical Lane Group | No | No | Yes | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 3.54 | 1.55 | 8.00 | 6.00 | 13.89 | 5.50 | 16.24 | 18.28 | 4.91 | 18.98 | 12.84 |
| 50th-Percentile Queue Length [ft/ln] | 88.58 | 38.78 | 199.91 | 149.99 | 347.26 | 137.62 | 406.12 | 456.89 | 122.63 | 474.44 | 320.92 |
| 95th-Percentile Queue Length [veh/ln] | 6.38 | 2.79 | 12.63 | 10.02 | 20.00 | 9.35 | 22.85 | 25.29 | 8.54 | 26.12 | 18.71 |
| 95th-Percentile Queue Length [ft/ln] | 159.45 | 69.81 | 315.84 | 250.42 | 500.07 | 233.81 | 571.37 | 632.17 | 213.44 | 653.05 | 467.82 |

**Movement, Approach, & Intersection Results**

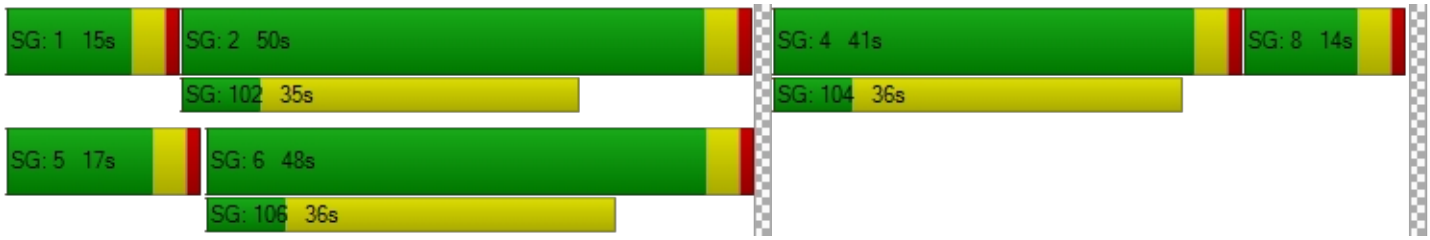
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 49.35 | 46.45 | 62.89 | 39.34 | 56.41 | 56.41 | 60.39 | 40.33 | 44.94 | 66.39 | 43.84 | 37.75 |
| Movement LOS | D | D | E | D | E | E | E | D | D | E | D | D |
| d_A, Approach Delay [s/veh] | 56.69 | | | 47.50 | | | 43.69 | | | 43.98 | | |
| Approach LOS | E | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 45.29 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.906 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.323 | 2.660 | 3.289 | 0.000 |
| Crosswalk LOS | B | B | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 167 | 616 | 766 | 733 |
| d_b, Bicycle Delay [s] | 50.45 | 28.73 | 22.84 | 24.09 |
| l_b,int, Bicycle LOS Score for Intersection | 1.908 | 3.033 | 2.738 | 2.957 |
| Bicycle LOS | A | C | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 148.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | F |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.348 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 326 | 554 | 607 | 595 | 421 | 186 | 139 | 1674 | 228 | 684 | 2074 | 973 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 326 | 554 | 607 | 595 | 421 | 186 | 139 | 1674 | 228 | 684 | 2074 | 973 |
| Peak Hour Factor | 0.9800 | 0.9800 | 0.9800 | 0.8330 | 0.8330 | 0.8330 | 0.9250 | 0.9250 | 0.9250 | 0.9230 | 0.9230 | 0.9230 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 83 | 141 | 155 | 179 | 126 | 56 | 38 | 452 | 62 | 185 | 562 | 264 |
| Total Analysis Volume [veh/h] | 333 | 565 | 619 | 714 | 505 | 223 | 150 | 1810 | 246 | 741 | 2247 | 1054 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 18 | 41 | 0 | 27 | 50 | 0 | 10 | 34 | 0 | 18 | 42 | 42 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 23 | 0 | 0 | 23 | 23 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 13 | 37 | 37 | 23 | 47 | 47 | 6 | 30 | 30 | 14 | 38 | 65 |
| g / C, Green / Cycle | 0.11 | 0.31 | 0.31 | 0.19 | 0.39 | 0.39 | 0.05 | 0.25 | 0.25 | 0.12 | 0.32 | 0.54 |
| (v / s)_i Volume / Saturation Flow Rate | 0.10 | 0.15 | 0.33 | 0.36 | 0.20 | 0.18 | 0.04 | 0.27 | 0.27 | 0.21 | 0.39 | 0.55 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 2000 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 389 | 1166 | 583 | 383 | 736 | 736 | 176 | 1432 | 477 | 409 | 1811 | 1031 |
| d1, Uniform Delay [s] | 52.40 | 33.87 | 41.60 | 48.51 | 28.13 | 27.58 | 56.54 | 44.94 | 44.94 | 53.00 | 40.95 | 27.44 |
| k, delay calibration | 0.11 | 0.11 | 0.50 | 0.24 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.48 | 0.31 | 54.71 | 392.72 | 0.56 | 0.48 | 10.83 | 45.70 | 68.25 | 367.12 | 113.23 | 33.72 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.86 | 0.48 | 1.06 | 1.86 | 0.51 | 0.47 | 0.85 | 1.07 | 1.09 | 1.81 | 1.24 | 1.02 |
| d, Delay for Lane Group [s/veh] | 57.88 | 34.18 | 96.31 | 441.23 | 28.69 | 28.06 | 67.37 | 90.64 | 113.19 | 420.12 | 154.17 | 61.16 |
| Lane Group LOS | E | C | F | F | C | C | E | F | F | F | F | F |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 5.22 | 6.75 | 25.85 | 26.62 | 8.41 | 7.58 | 2.52 | 20.14 | 23.13 | 27.01 | 36.57 | 37.57 |
| 50th-Percentile Queue Length [ft/ln] | 130.46 | 168.85 | 646.32 | 665.59 | 210.20 | 189.53 | 63.01 | 503.62 | 578.36 | 675.35 | 914.35 | 939.30 |
| 95th-Percentile Queue Length [veh/ln] | 8.97 | 11.02 | 35.56 | 43.65 | 13.16 | 12.10 | 4.54 | 28.66 | 32.68 | 42.75 | 52.96 | 48.52 |
| 95th-Percentile Queue Length [ft/ln] | 224.13 | 275.41 | 889.12 | 1091.37 | 329.08 | 302.42 | 113.41 | 716.57 | 816.90 | 1068.72 | 1323.92 | 1212.96 |

**Movement, Approach, & Intersection Results**

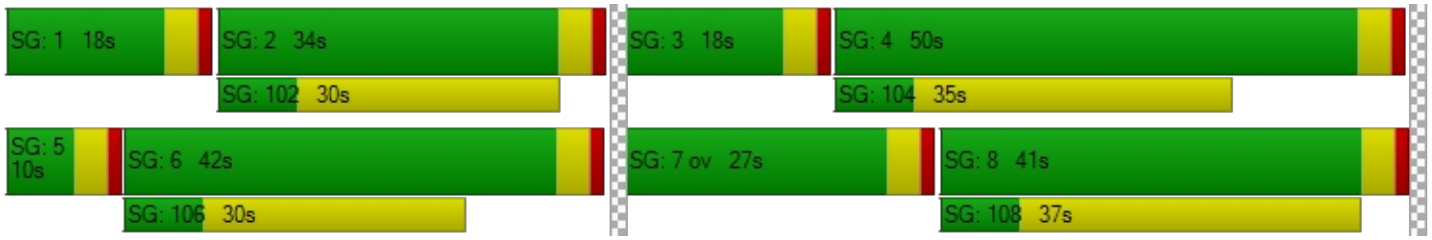
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 57.88 | 34.18 | 96.31 | 441.23 | 28.53 | 28.06 | 67.37 | 94.07 | 113.19 | 420.12 | 154.17 | 61.16 |
| Movement LOS | E | C | F | F | C | C | E | F | F | F | F | F |
| d_A, Approach Delay [s/veh] | 64.73 | | | 232.80 | | | 94.39 | | | 178.67 | | |
| Approach LOS | E | | | F | | | F | | | F | | |
| d_I, Intersection Delay [s/veh] | 148.18 | | | | | | | | | | | |
| Intersection LOS | F | | | | | | | | | | | |
| Intersection V/C | 1.348 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.51 | 49.51 | 49.51 | 49.51 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.027 | 2.988 | 3.406 | 3.681 |
| Crosswalk LOS | C | C | C | D |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 617 | 767 | 500 | 633 |
| d_b, Bicycle Delay [s] | 28.71 | 22.82 | 33.76 | 28.02 |
| l_b,int, Bicycle LOS Score for Intersection | 2.811 | 2.749 | 2.470 | 3.783 |
| Bicycle LOS | C | B | B | D |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 20.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.849 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 555 | 0 | 777 | 0 | 2000 | 1183 | 0 | 2807 | 349 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 555 | 0 | 777 | 0 | 2000 | 1183 | 0 | 2807 | 349 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 0.9240 | 1.0000 | 0.9240 | 1.0000 | 0.9460 | 0.9460 | 1.0000 | 0.9730 | 0.9730 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 150 | 0 | 210 | 0 | 529 | 313 | 0 | 721 | 90 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 601 | 0 | 841 | 0 | 2114 | 1251 | 0 | 2885 | 359 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_di, Inbound Pedestrian Volume crossing m | | 0 | | | 0 | | | 0 | | | 0 | |
| v_co, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ci, Inbound Pedestrian Volume crossing mi | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ab, Corner Pedestrian Volume [ped/h] | | 0 | | | 0 | | | 0 | | | 0 | |
| Bicycle Volume [bicycles/h] | | 0 | | | 0 | | | 0 | | | 0 | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 8.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 74 | 0 | 0 | 0 | 26 | 0 | 0 | 26 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | | No | |
| Maximum Recall | | | | No | | | | No | | | No | |
| Pedestrian Recall | | | | No | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | C | R | C | C |
|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 32 | 32 | 32 | 60 | 60 |
| g / C, Green / Cycle | | 0.32 | 0.32 | 0.32 | 0.60 | 0.60 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.27 | 0.27 | 0.25 | 0.37 | 0.51 |
| s, saturation flow rate [veh/h] | | 1750 | 1750 | 1900 | 5700 | 5700 |
| c, Capacity [veh/h] | | 564 | 564 | 613 | 3405 | 3405 |
| d1, Uniform Delay [s] | | 31.60 | 31.60 | 30.68 | 12.87 | 16.39 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 3.75 | 3.75 | 2.26 | 0.86 | 2.82 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.85 | 0.85 | 0.78 | 0.62 | 0.85 |
| d, Delay for Lane Group [s/veh] | | 35.35 | 35.35 | 32.94 | 13.73 | 19.21 |
| Lane Group LOS | | D | D | C | B | B |
| Critical Lane Group | | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | | 11.13 | 11.13 | 10.62 | 9.57 | 17.05 |
| 50th-Percentile Queue Length [ft/ln] | | 278.31 | 278.31 | 265.57 | 239.26 | 426.35 |
| 95th-Percentile Queue Length [veh/ln] | | 16.60 | 16.60 | 15.97 | 14.64 | 23.83 |
| 95th-Percentile Queue Length [ft/ln] | | 415.10 | 415.10 | 399.20 | 366.10 | 595.66 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 35.35 | 0.00 | 33.97 | 0.00 | 13.73 | 0.00 | 0.00 | 19.21 | 0.00 |
| Movement LOS | | | | D | | C | | B | | | B | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 34.55 | | | 13.73 | | | 19.21 | | |
| Approach LOS | A | | | C | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 20.84 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.849 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 0.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 0.00 | 39.57 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 0.000 | 2.487 | 0.000 | 0.000 |
| Crosswalk LOS | F | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 1401 | 440 | 440 |
| d_b, Bicycle Delay [s] | 49.97 | 4.48 | 30.39 | 30.39 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 3.939 | 2.722 | 3.146 |
| Bicycle LOS | D | D | B | C |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 34.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.854 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1493 | 73 | 606 | 0 | 0 | 257 | 236 | 1976 | 591 | 0 | 2033 | 36 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1493 | 73 | 606 | 0 | 0 | 257 | 236 | 1976 | 591 | 0 | 2033 | 36 |
| Peak Hour Factor | 0.9320 | 0.9320 | 0.9320 | 1.0000 | 1.0000 | 0.8040 | 0.9340 | 0.9340 | 0.9340 | 1.0000 | 0.9510 | 0.9510 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 400 | 20 | 163 | 0 | 0 | 80 | 63 | 529 | 158 | 0 | 534 | 9 |
| Total Analysis Volume [veh/h] | 1602 | 78 | 650 | 0 | 0 | 320 | 253 | 2116 | 633 | 0 | 2138 | 38 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 115 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 0 | 6 | 6 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 56 | 0 | 0 | 0 | 29 | 29 | 59 | 0 | 0 | 30 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | | No | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | | No | No | No | | | No | |
| Maximum Recall | | No | | | | No | No | No | | | No | |
| Pedestrian Recall | | No | | | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 45 | 45 | 45 | 19 | 19 | 62 | 39 | 39 |
| g / C, Green / Cycle | 0.39 | 0.39 | 0.39 | 0.16 | 0.16 | 0.54 | 0.34 | 0.34 |
| (v / s)_i Volume / Saturation Flow Rate | 0.33 | 0.34 | 0.31 | 0.08 | 0.14 | 0.37 | 0.29 | 0.29 |
| s, saturation flow rate [veh/h] | 3500 | 1750 | 1900 | 3800 | 1800 | 5700 | 5700 | 1900 |
| c, Capacity [veh/h] | 1366 | 683 | 742 | 619 | 293 | 3078 | 1951 | 650 |
| d1, Uniform Delay [s] | 31.78 | 32.25 | 31.00 | 43.99 | 46.87 | 19.34 | 34.83 | 34.83 |
| k, delay calibration | 0.11 | 0.28 | 0.24 | 0.11 | 0.11 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.46 | 8.31 | 4.28 | 0.67 | 7.71 | 1.27 | 4.44 | 12.14 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.84 | 0.87 | 0.80 | 0.52 | 0.86 | 0.69 | 0.84 | 0.84 |
| d, Delay for Lane Group [s/veh] | 33.24 | 40.56 | 35.28 | 44.66 | 54.58 | 20.62 | 39.27 | 46.96 |
| Lane Group LOS | C | D | D | D | D | C | D | D |
| Critical Lane Group | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 14.44 | 16.38 | 15.11 | 4.22 | 7.65 | 13.61 | 14.62 | 16.01 |
| 50th-Percentile Queue Length [ft/ln] | 360.92 | 409.38 | 377.65 | 105.62 | 191.23 | 340.33 | 365.44 | 400.19 |
| 95th-Percentile Queue Length [veh/ln] | 20.67 | 23.01 | 21.48 | 7.60 | 12.19 | 19.66 | 20.89 | 22.57 |
| 95th-Percentile Queue Length [ft/ln] | 516.71 | 575.29 | 537.00 | 189.90 | 304.63 | 491.61 | 522.20 | 564.23 |

**Movement, Approach, & Intersection Results**

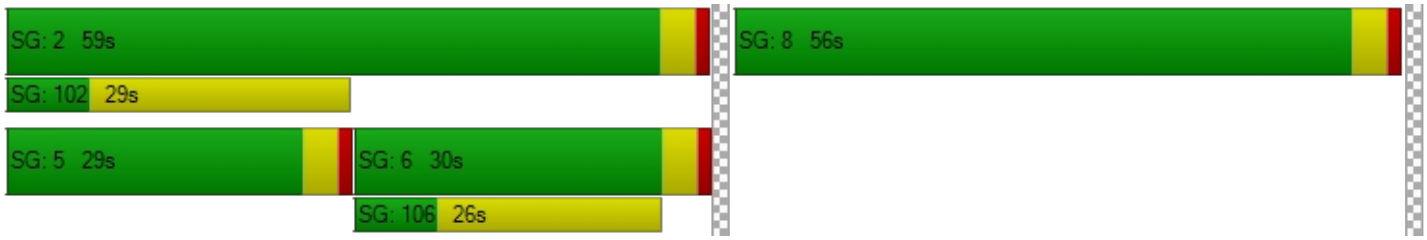
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 35.28 | 40.56 | 35.82 | 0.00 | 0.00 | 44.66 | 54.58 | 20.62 | 0.00 | 0.00 | 41.09 | 46.96 |
| Movement LOS | D | D | D | | | D | D | C | | | D | D |
| d_A, Approach Delay [s/veh] | 35.61 | | | 44.66 | | | 24.25 | | | 41.20 | | |
| Approach LOS | D | | | D | | | C | | | D | | |
| d_I, Intersection Delay [s/veh] | 33.96 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.854 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 47.01 | 47.01 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.766 | 2.176 | 0.000 | 0.000 |
| Crosswalk LOS | C | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 905 | 435 | 957 | 452 |
| d_b, Bicycle Delay [s] | 17.25 | 35.21 | 15.64 | 34.43 |
| l_b,int, Bicycle LOS Score for Intersection | 5.404 | 1.560 | 2.863 | 2.457 |
| Bicycle LOS | F | A | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 35.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.850 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 248 | 186 | 115 | 313 | 238 | 193 | 241 | 1897 | 252 | 152 | 1673 | 217 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 248 | 186 | 115 | 313 | 238 | 193 | 241 | 1897 | 252 | 152 | 1673 | 217 |
| Peak Hour Factor | 0.9140 | 0.9140 | 0.9140 | 0.8970 | 0.8970 | 0.8970 | 0.9020 | 0.9020 | 0.9020 | 0.9490 | 0.9490 | 0.9490 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 68 | 51 | 31 | 87 | 66 | 54 | 67 | 526 | 70 | 40 | 441 | 57 |
| Total Analysis Volume [veh/h] | 271 | 204 | 126 | 349 | 265 | 215 | 267 | 2103 | 279 | 160 | 1763 | 229 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 115 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 13 | 39 | 0 | 17 | 43 | 0 | 23 | 44 | 0 | 15 | 36 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 29 | 0 | 0 | 26 | 0 | 0 | 25 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 9 | 15 | 15 | 13 | 19 | 19 | 19 | 60 | 60 | 11 | 52 | 52 |
| g / C, Green / Cycle | 0.08 | 0.13 | 0.13 | 0.11 | 0.16 | 0.16 | 0.16 | 0.52 | 0.52 | 0.10 | 0.46 | 0.46 |
| (v / s)_i Volume / Saturation Flow Rate | 0.08 | 0.09 | 0.08 | 0.10 | 0.14 | 0.11 | 0.15 | 0.41 | 0.43 | 0.09 | 0.26 | 0.27 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 276 | 245 | 245 | 397 | 311 | 311 | 295 | 1985 | 992 | 173 | 2592 | 864 |
| d1, Uniform Delay [s] | 52.91 | 48.08 | 47.56 | 50.22 | 46.79 | 45.40 | 47.25 | 22.40 | 22.87 | 51.58 | 23.14 | 23.31 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.13 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 21.05 | 3.82 | 2.72 | 6.33 | 6.61 | 2.76 | 12.25 | 3.34 | 7.37 | 17.88 | 0.93 | 2.89 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.98 | 0.71 | 0.64 | 0.88 | 0.85 | 0.69 | 0.91 | 0.79 | 0.82 | 0.92 | 0.57 | 0.59 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 73.96 | 51.90 | 50.28 | 56.55 | 53.39 | 48.16 | 59.50 | 25.74 | 30.24 | 69.46 | 24.06 | 26.20 |
| Lane Group LOS | E | D | D | E | D | D | E | C | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 4.71 | 5.06 | 4.41 | 5.28 | 7.92 | 6.02 | 8.48 | 17.50 | 19.45 | 5.43 | 9.95 | 10.70 |
| 50th-Percentile Queue Length [ft/ln] | 117.71 | 126.41 | 110.32 | 132.06 | 197.89 | 150.52 | 211.98 | 437.38 | 486.37 | 135.68 | 248.77 | 267.41 |
| 95th-Percentile Queue Length [veh/ln] | 8.27 | 8.74 | 7.86 | 9.05 | 12.53 | 10.05 | 13.25 | 24.36 | 26.69 | 9.25 | 15.12 | 16.06 |
| 95th-Percentile Queue Length [ft/ln] | 206.67 | 218.60 | 196.45 | 226.29 | 313.25 | 251.13 | 331.36 | 608.88 | 667.21 | 231.19 | 378.10 | 401.50 |

**Movement, Approach, & Intersection Results**

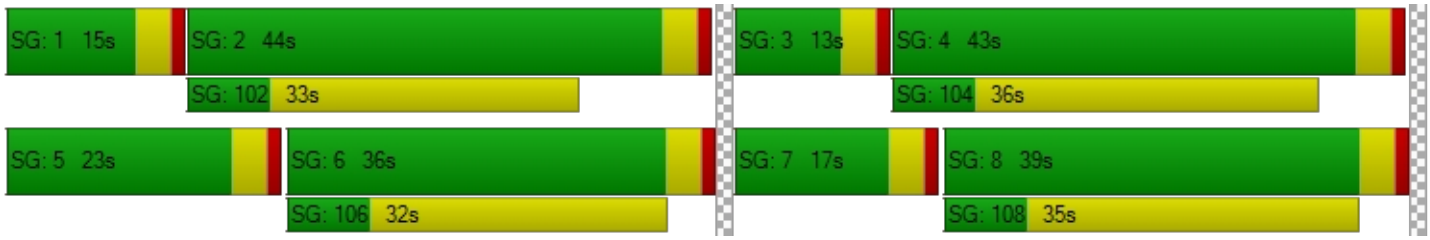
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 73.96 | 51.67 | 50.28 | 56.55 | 53.39 | 48.16 | 59.50 | 26.88 | 30.24 | 69.46 | 24.40 | 26.20 |
| Movement LOS | E | D | D | E | D | D | E | C | C | E | C | C |
| d_A, Approach Delay [s/veh] | 61.43 | | | 53.37 | | | 30.52 | | | 27.94 | | |
| Approach LOS | E | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 35.65 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.850 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 47.05 | 47.05 | 47.05 | 47.05 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.566 | 2.713 | 3.334 | 3.314 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 608 | 678 | 695 | 556 |
| d_b, Bicycle Delay [s] | 27.84 | 25.13 | 24.47 | 29.97 |
| l_b,int, Bicycle LOS Score for Intersection | 2.055 | 2.927 | 3.017 | 2.447 |
| Bicycle LOS | B | C | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 23.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.811 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 179 | 18 | 244 | 27 | 11 | 12 | 25 | 2031 | 299 | 212 | 1951 | 48 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 179 | 18 | 244 | 27 | 11 | 12 | 25 | 2031 | 299 | 212 | 1951 | 48 |
| Peak Hour Factor | 0.9770 | 0.9770 | 0.9770 | 0.8650 | 0.8650 | 0.8650 | 0.9010 | 0.9010 | 0.9010 | 0.9030 | 0.9030 | 0.9030 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 46 | 5 | 62 | 8 | 3 | 3 | 7 | 564 | 83 | 59 | 540 | 13 |
| Total Analysis Volume [veh/h] | 183 | 18 | 250 | 31 | 13 | 14 | 28 | 2254 | 332 | 235 | 2161 | 53 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 95 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 26 | 0 | 0 | 10 | 0 | 10 | 32 | 0 | 27 | 49 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 14 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 15 | 15 | 15 | 5 | 5 | 3 | 45 | 45 | 14 | 56 | 56 |
| g / C, Green / Cycle | 0.16 | 0.16 | 0.16 | 0.05 | 0.05 | 0.03 | 0.47 | 0.47 | 0.15 | 0.59 | 0.59 |
| (v / s)_i Volume / Saturation Flow Rate | 0.06 | 0.06 | 0.13 | 0.02 | 0.01 | 0.02 | 0.40 | 0.17 | 0.13 | 0.38 | 0.40 |
| s, saturation flow rate [veh/h] | 1750 | 1750 | 1900 | 1800 | 1900 | 1800 | 5700 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 277 | 277 | 300 | 91 | 96 | 62 | 2680 | 893 | 275 | 2238 | 1119 |
| d1, Uniform Delay [s] | 35.78 | 35.80 | 38.84 | 43.63 | 43.50 | 45.07 | 22.09 | 16.18 | 39.27 | 13.03 | 13.39 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.80 | 0.81 | 5.98 | 2.18 | 1.57 | 5.12 | 3.39 | 1.19 | 7.41 | 1.48 | 3.32 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.36 | 0.36 | 0.83 | 0.34 | 0.28 | 0.45 | 0.84 | 0.37 | 0.85 | 0.65 | 0.68 |
| d, Delay for Lane Group [s/veh] | 36.57 | 36.60 | 44.82 | 45.81 | 45.06 | 50.20 | 25.48 | 17.37 | 46.68 | 14.51 | 16.71 |
| Lane Group LOS | D | D | D | D | D | D | C | B | D | B | B |
| Critical Lane Group | No | No | Yes | Yes | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.12 | 2.13 | 6.07 | 0.76 | 0.65 | 0.73 | 14.61 | 4.75 | 5.84 | 9.82 | 11.07 |
| 50th-Percentile Queue Length [ft/ln] | 52.89 | 53.37 | 151.76 | 18.89 | 16.25 | 18.29 | 365.28 | 118.80 | 145.94 | 245.60 | 276.83 |
| 95th-Percentile Queue Length [veh/ln] | 3.81 | 3.84 | 10.11 | 1.36 | 1.17 | 1.32 | 20.88 | 8.33 | 9.80 | 14.96 | 16.53 |
| 95th-Percentile Queue Length [ft/ln] | 95.20 | 96.07 | 252.78 | 34.00 | 29.25 | 32.93 | 522.00 | 208.17 | 245.00 | 374.11 | 413.26 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 36.59 | 36.60 | 44.82 | 45.81 | 45.06 | 45.06 | 50.20 | 25.48 | 17.37 | 46.68 | 15.23 | 16.71 |
| Movement LOS | D | D | D | D | D | D | D | C | B | D | B | B |
| d_A, Approach Delay [s/veh] | 41.15 | | | 45.46 | | | 24.71 | | | 18.28 | | |
| Approach LOS | D | | | D | | | C | | | B | | |
| d_I, Intersection Delay [s/veh] | 23.43 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.811 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 37.18 | 37.18 | 0.00 | 37.18 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.385 | 1.994 | 0.000 | 3.290 |
| Crosswalk LOS | B | A | F | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 463 | 126 | 589 | 947 |
| d_b, Bicycle Delay [s] | 28.09 | 41.73 | 23.66 | 13.19 |
| l_b,int, Bicycle LOS Score for Intersection | 2.304 | 1.655 | 2.997 | 2.907 |
| Bicycle LOS | B | A | C | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



*APPENDIX D-III*

# YEAR 2026 PLUS PROJECT TRAFFIC CONDITIONS

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 HCM Network.vistro
Report File: N:\...\AM 2026+P.pdf

Scenario 7 AM 2026+P
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | HCM 6th Edition | NB Thru | 0.846 | 37.7 | D |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | HCM 6th Edition | WB Left | 0.889 | 29.1 | C |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | HCM 6th Edition | NB Left | 0.901 | 27.1 | C |
| 4 | Randolph Avenue at Birch Street | Signalized | HCM 6th Edition | WB Left | 0.404 | 14.4 | B |
| 5 | State College Boulevard at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.694 | 40.7 | D |
| 6 | S Associated Road at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.816 | 28.4 | C |
| 7 | Randolph Avenue at Madison Way | Signalized | HCM 6th Edition | SB Left | 0.155 | 16.3 | B |
| 8 | Randolph Avenue at Brea Mall | Signalized | HCM 6th Edition | EB Left | 0.197 | 17.3 | B |
| 9 | Brea Mall South at State College Boulevard | Signalized | HCM 6th Edition | WB Left | 0.301 | 20.3 | C |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | HCM 6th Edition | EB Right | 0.935 | 46.2 | D |
| 11 | Puente Street at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.595 | 20.6 | C |
| 12 | Brea Boulevard at Imperial Highway | Signalized | HCM 6th Edition | EB Left | 0.973 | 48.0 | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.612 | 16.6 | B |
| 14 | State College Boulevard at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.875 | 36.0 | D |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.683 | 16.2 | B |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | HCM 6th Edition | EB Left | 0.699 | 22.6 | C |
| 17 | Associated Road at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.813 | 32.7 | C |
| 18 | Castlegate Lane/Placentia | Signalized | HCM 6th | EB Left | 0.723 | 19.2 | B |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | Edition | EB Left | 0.723 | 19.2 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 37.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.846 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 173 | 225 | 213 | 926 | 620 | 8 | 15 | 1400 | 212 | 486 | 1794 | 576 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 173 | 225 | 213 | 926 | 620 | 8 | 15 | 1400 | 212 | 486 | 1794 | 576 |
| Peak Hour Factor | 0.9130 | 0.9130 | 0.9130 | 0.9700 | 0.9700 | 0.9700 | 0.9540 | 0.9540 | 0.9540 | 0.9540 | 0.9540 | 0.9540 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 47 | 62 | 58 | 239 | 160 | 2 | 4 | 367 | 56 | 127 | 470 | 151 |
| Total Analysis Volume [veh/h] | 189 | 246 | 233 | 955 | 639 | 8 | 16 | 1468 | 222 | 509 | 1881 | 604 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 12 | 14 | 0 | 42 | 44 | 0 | 10 | 39 | 0 | 25 | 54 | 54 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 28 | 0 | 0 | 22 | 22 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 8 | 12 | 12 | 12 | 36 | 40 | 40 | 3 | 37 | 37 | 19 | 53 | 93 |
| g / C, Green / Cycle | 0.07 | 0.10 | 0.10 | 0.10 | 0.30 | 0.33 | 0.33 | 0.02 | 0.30 | 0.30 | 0.16 | 0.45 | 0.78 |
| (v / s)_i Volume / Saturation Flow Rate | 0.05 | 0.09 | 0.08 | 0.08 | 0.27 | 0.17 | 0.17 | 0.00 | 0.22 | 0.22 | 0.15 | 0.33 | 0.32 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1900 | 3500 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 236 | 191 | 191 | 191 | 1048 | 632 | 632 | 76 | 1733 | 578 | 569 | 2537 | 1478 |
| d1, Uniform Delay [s] | 55.20 | 53.40 | 52.99 | 52.68 | 40.51 | 32.22 | 32.20 | 57.73 | 37.37 | 37.47 | 49.26 | 27.59 | 4.34 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 6.24 | 14.04 | 8.91 | 6.65 | 3.49 | 0.64 | 0.64 | 1.37 | 2.74 | 8.16 | 5.21 | 2.00 | 0.84 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.80 | 0.90 | 0.83 | 0.78 | 0.91 | 0.51 | 0.51 | 0.21 | 0.73 | 0.74 | 0.89 | 0.74 | 0.41 |
| d, Delay for Lane Group [s/veh] | 61.44 | 67.44 | 61.90 | 59.33 | 43.99 | 32.87 | 32.85 | 59.10 | 40.11 | 45.63 | 54.46 | 29.59 | 5.18 |
| Lane Group LOS | E | E | E | E | D | C | C | E | D | D | D | C | A |
| Critical Lane Group | No | Yes | No | No | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 3.02 | 5.87 | 5.16 | 4.72 | 13.95 | 7.67 | 7.65 | 0.25 | 11.44 | 12.45 | 7.87 | 15.07 | 4.33 |
| 50th-Percentile Queue Length [ft/ln] | 75.59 | 146.8 | 129.0 | 117.9 | 348.81 | 191.81 | 191.22 | 6.34 | 285.99 | 311.19 | 196.73 | 376.67 | 108.28 |
| 95th-Percentile Queue Length [veh/ln] | 5.44 | 9.85 | 8.89 | 8.28 | 20.08 | 12.22 | 12.18 | 0.46 | 16.99 | 18.23 | 12.47 | 21.43 | 7.74 |
| 95th-Percentile Queue Length [ft/ln] | 136.0 | 246.1 | 222.2 | 206.9 | 501.95 | 305.38 | 304.61 | 11.41 | 424.66 | 455.85 | 311.75 | 535.82 | 193.60 |

**Movement, Approach, & Intersection Results**

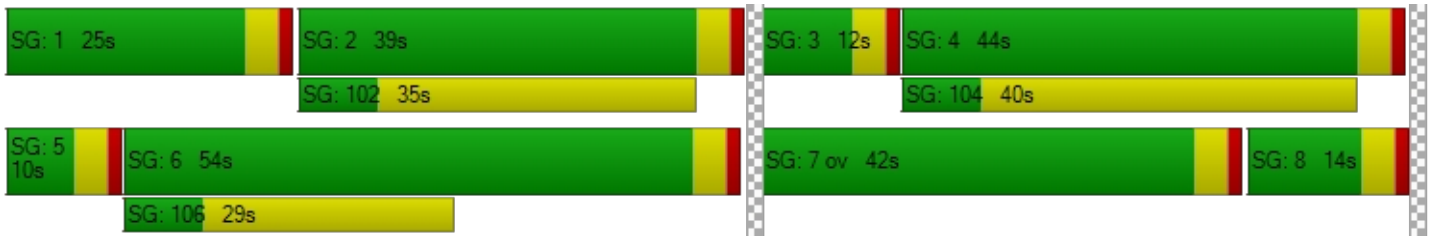
| d_M, Delay for Movement [s/veh] | 61.44 | 65.78 | 60.18 | 43.99 | 32.86 | 32.85 | 59.10 | 40.87 | 45.63 | 54.46 | 29.59 | 5.18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | E | E | E | D | C | C | E | D | D | D | C | A |
| d_A, Approach Delay [s/veh] | 62.63 | | | 39.50 | | | 41.66 | | | 28.90 | | |
| Approach LOS | E | | | D | | | D | | | C | | |
| d_I, Intersection Delay [s/veh] | 37.69 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.846 | | | | | | | | | | | |

**Other Modes**

| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
|---|---|---|---|---|
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.892 | 2.868 | 3.273 | 0.000 |
| Crosswalk LOS | C | C | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 167 | 666 | 583 | 833 |
| d_b, Bicycle Delay [s] | 50.43 | 26.68 | 30.12 | 20.43 |
| l_b,int, Bicycle LOS Score for Intersection | 2.111 | 2.881 | 2.263 | 3.206 |
| Bicycle LOS | B | C | B | C |

## Sequence

| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 29.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.889 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 1071 | 0 | 713 | 0 | 1909 | 635 | 246 | 2204 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 1071 | 0 | 713 | 0 | 1909 | 635 | 246 | 2204 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 0.8640 | 1.0000 | 0.8640 | 1.0000 | 0.9400 | 0.9400 | 0.9190 | 0.9190 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 310 | 0 | 206 | 0 | 508 | 169 | 67 | 600 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 1240 | 0 | 825 | 0 | 2031 | 676 | 268 | 2398 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 105 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 42 | 0 | 13 | 55 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 20 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | No | No | |
| Maximum Recall | | | | No | | | | No | | No | No | |
| Pedestrian Recall | | | | No | | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | R | C | R | L | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 105 | 105 | 105 | 105 | 105 | 105 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 42 | 42 | 42 | 42 | 9 | 55 |
| g / C, Green / Cycle | | 0.40 | 0.40 | 0.40 | 0.40 | 0.09 | 0.52 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.35 | 0.22 | 0.36 | 0.18 | 0.08 | 0.42 |
| s, saturation flow rate [veh/h] | | 3500 | 3800 | 5700 | 3800 | 3500 | 5700 |
| c, Capacity [veh/h] | | 1397 | 1516 | 2281 | 1521 | 303 | 2991 |
| d1, Uniform Delay [s] | | 29.36 | 24.21 | 29.34 | 22.98 | 47.44 | 20.47 |
| k, delay calibration | | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 2.11 | 0.31 | 5.75 | 0.94 | 8.50 | 2.37 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.89 | 0.54 | 0.89 | 0.44 | 0.89 | 0.80 |
| d, Delay for Lane Group [s/veh] | | 31.47 | 24.52 | 35.09 | 23.92 | 55.94 | 22.84 |
| Lane Group LOS | | C | C | D | C | E | C |
| Critical Lane Group | | Yes | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | | 14.47 | 7.78 | 16.57 | 6.20 | 3.81 | 15.80 |
| 50th-Percentile Queue Length [ft/ln] | | 361.70 | 194.46 | 414.24 | 155.06 | 95.17 | 395.11 |
| 95th-Percentile Queue Length [veh/ln] | | 20.71 | 12.35 | 23.25 | 10.29 | 6.85 | 22.32 |
| 95th-Percentile Queue Length [ft/ln] | | 517.65 | 308.81 | 581.14 | 257.16 | 171.31 | 558.10 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 31.47 | 0.00 | 24.52 | 0.00 | 35.09 | 23.92 | 55.94 | 22.84 | 0.00 |
| Movement LOS | | | | C | | C | | D | C | E | C | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 28.70 | | | 32.30 | | | 26.17 | | |
| Approach LOS | A | | | C | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 29.10 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.889 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 42.07 | 42.07 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.182 | 2.642 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 876 | 724 | 971 |
| d_b, Bicycle Delay [s] | 52.50 | 16.57 | 21.37 | 13.88 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 1.560 | 3.048 | 3.026 |
| Bicycle LOS | D | A | C | C |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 27.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.901 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | | | | No | | | No | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1080 | 0 | 512 | 0 | 0 | 0 | 0 | 2557 | 413 | 0 | 1382 | 498 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1080 | 0 | 512 | 0 | 0 | 0 | 0 | 2557 | 413 | 0 | 1382 | 498 |
| Peak Hour Factor | 0.8940 | 1.0000 | 0.8940 | 1.0000 | 1.0000 | 1.0000 | 0.9710 | 0.9710 | 0.9710 | 1.0000 | 0.8830 | 0.8830 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 302 | 0 | 143 | 0 | 0 | 0 | 0 | 658 | 106 | 0 | 391 | 0 |
| Total Analysis Volume [veh/h] | 1208 | 0 | 573 | 0 | 0 | 0 | 0 | 2633 | 425 | 0 | 1565 | 0 |
| Presence of On-Street Parking | No | | No | | | | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 115 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 79 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 36 | 0 |
| Vehicle Extension [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | No | | | | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | | | | | | | No | | | No | |
| Maximum Recall | No | | | | | | | No | | | No | |
| Pedestrian Recall | No | | | | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | R | | C | C | R | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 115 | 115 | | 115 | 115 | 115 | 115 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 46 | 46 | | 61 | 61 | 61 | 61 |
| g / C, Green / Cycle | 0.40 | 0.40 | | 0.53 | 0.53 | 0.53 | 0.53 |
| (v / s)_i Volume / Saturation Flow Rate | 0.35 | 0.30 | | 0.46 | 0.46 | 0.22 | 0.27 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | | 3800 | 1900 | 1900 | 5700 |
| c, Capacity [veh/h] | 1390 | 755 | | 2026 | 1013 | 1013 | 3039 |
| d1, Uniform Delay [s] | 31.86 | 29.87 | | 23.25 | 23.25 | 16.12 | 17.25 |
| k, delay calibration | 0.11 | 0.11 | | 0.50 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.80 | 1.60 | | 5.29 | 9.89 | 1.28 | 0.63 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.87 | 0.76 | | 0.87 | 0.87 | 0.42 | 0.51 |
| d, Delay for Lane Group [s/veh] | 33.66 | 31.47 | | 28.55 | 33.15 | 17.39 | 17.87 |
| Lane Group LOS | C | C | | C | C | B | B |
| Critical Lane Group | Yes | No | | Yes | No | No | No |
| 50th-Percentile Queue Length [veh/ln] | 15.42 | 13.74 | | 21.11 | 22.41 | 6.95 | 8.83 |
| 50th-Percentile Queue Length [ft/ln] | 385.52 | 343.59 | | 527.83 | 560.18 | 173.64 | 220.69 |
| 95th-Percentile Queue Length [veh/ln] | 21.86 | 19.82 | | 28.65 | 30.17 | 11.27 | 13.70 |
| 95th-Percentile Queue Length [ft/ln] | 546.53 | 495.59 | | 716.22 | 754.26 | 281.70 | 342.50 |

**Movement, Approach, & Intersection Results**

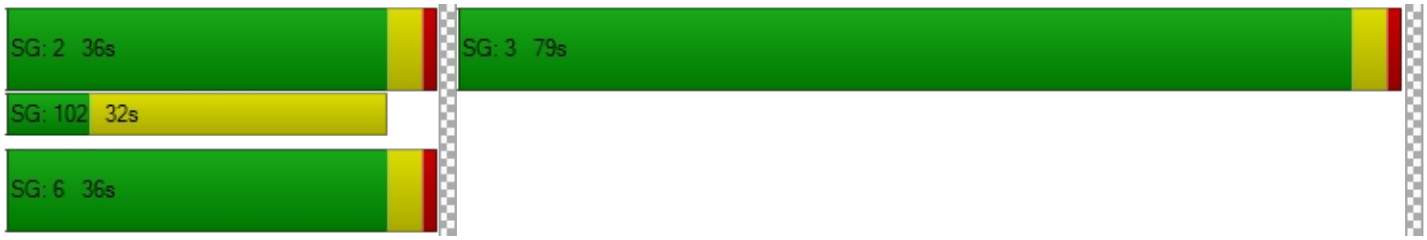
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 33.66 | 0.00 | 31.47 | 0.00 | 0.00 | 0.00 | 0.00 | 29.59 | 17.39 | 0.00 | 17.87 | 0.00 |
| Movement LOS | C | | C | | | | | C | B | | B | |
| d_A, Approach Delay [s/veh] | 32.96 | | | 0.00 | | | 28.32 | | | 17.87 | | |
| Approach LOS | C | | | A | | | C | | | B | | |
| d_I, Intersection Delay [s/veh] | 27.06 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.901 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 0.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 46.98 | 0.00 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.742 | 0.000 | 0.000 | 0.000 |
| Crosswalk LOS | B | F | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1305 | 0 | 557 | 557 |
| d_b, Bicycle Delay [s] | 6.93 | 57.45 | 29.91 | 29.91 |
| l_b,int, Bicycle LOS Score for Intersection | 1.560 | 4.132 | 3.242 | 2.420 |
| Bicycle LOS | A | D | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 14.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.404 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 35 | 44 | 96 | 38 | 37 | 26 | 41 | 622 | 103 | 81 | 566 | 45 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 35 | 44 | 96 | 38 | 37 | 26 | 41 | 622 | 103 | 81 | 566 | 45 |
| Peak Hour Factor | 0.8140 | 0.8140 | 0.8140 | 0.7190 | 0.7190 | 0.7190 | 0.8220 | 0.8220 | 0.8220 | 0.8940 | 0.8940 | 0.8940 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 11 | 14 | 29 | 13 | 13 | 9 | 12 | 189 | 31 | 23 | 158 | 13 |
| Total Analysis Volume [veh/h] | 43 | 54 | 118 | 53 | 51 | 36 | 50 | 757 | 125 | 91 | 633 | 50 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 38 | 0 | 0 | 38 | 0 | 11 | 30 | 0 | 22 | 41 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 25 | 0 | 0 | 19 | 0 | 0 | 18 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 8 | 8 | 8 | 8 | 8 | 4 | 64 | 64 | 6 | 66 | 66 |
| g / C, Green / Cycle | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.05 | 0.71 | 0.71 | 0.07 | 0.73 | 0.73 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.03 | 0.06 | 0.03 | 0.05 | 0.03 | 0.24 | 0.23 | 0.05 | 0.17 | 0.03 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 126 | 167 | 167 | 157 | 167 | 88 | 1353 | 1353 | 120 | 2774 | 1387 |
| d1, Uniform Delay [s] | 38.36 | 38.53 | 39.92 | 38.57 | 39.24 | 41.91 | 4.90 | 4.83 | 41.32 | 3.94 | 3.37 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.58 | 1.10 | 5.33 | 1.27 | 2.49 | 5.70 | 0.67 | 0.62 | 9.42 | 0.19 | 0.05 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.34 | 0.32 | 0.70 | 0.34 | 0.52 | 0.57 | 0.33 | 0.32 | 0.76 | 0.23 | 0.04 |
| d, Delay for Lane Group [s/veh] | 39.94 | 39.64 | 45.25 | 39.84 | 41.72 | 47.61 | 5.56 | 5.44 | 50.73 | 4.13 | 3.42 |
| Lane Group LOS | D | D | D | D | D | D | A | A | D | A | A |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.93 | 1.16 | 2.76 | 1.14 | 1.93 | 1.21 | 2.80 | 2.62 | 2.28 | 1.54 | 0.22 |
| 50th-Percentile Queue Length [ft/ln] | 23.34 | 28.97 | 68.88 | 28.58 | 48.31 | 30.37 | 69.97 | 65.52 | 56.88 | 38.38 | 5.41 |
| 95th-Percentile Queue Length [veh/ln] | 1.68 | 2.09 | 4.96 | 2.06 | 3.48 | 2.19 | 5.04 | 4.72 | 4.10 | 2.76 | 0.39 |
| 95th-Percentile Queue Length [ft/ln] | 42.00 | 52.15 | 123.99 | 51.45 | 86.96 | 54.67 | 125.95 | 117.93 | 102.39 | 69.08 | 9.73 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 39.94 | 39.64 | 45.25 | 39.84 | 41.72 | 41.72 | 47.61 | 5.52 | 5.44 | 50.73 | 4.13 | 3.42 |
| Movement LOS | D | D | D | D | D | D | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 42.78 | | | 41.01 | | | 7.76 | | | 9.57 | | |
| Approach LOS | D | | | D | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 14.35 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.404 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.248 | 2.035 | 2.681 | 2.804 |
| Crosswalk LOS | B | B | B | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 755 | 755 | 578 | 822 |
| d_b, Bicycle Delay [s] | 17.43 | 17.43 | 22.77 | 15.62 |
| l_b,int, Bicycle LOS Score for Intersection | 1.914 | 1.791 | 2.329 | 2.198 |
| Bicycle LOS | A | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 40.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.694 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 80 | 161 | 104 | 696 | 874 | 232 | 115 | 546 | 50 | 84 | 597 | 304 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 80 | 161 | 104 | 696 | 874 | 232 | 115 | 546 | 50 | 84 | 597 | 304 |
| Peak Hour Factor | 0.8430 | 0.8430 | 0.8430 | 0.8910 | 0.8910 | 0.8910 | 0.8600 | 0.8600 | 0.8600 | 0.7640 | 0.7640 | 0.7640 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 24 | 48 | 31 | 195 | 245 | 65 | 33 | 159 | 15 | 27 | 195 | 99 |
| Total Analysis Volume [veh/h] | 95 | 191 | 123 | 781 | 981 | 260 | 134 | 635 | 58 | 110 | 781 | 398 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 26 | 39 | 0 | 32 | 45 | 0 | 10 | 39 | 0 | 10 | 39 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 21 | 21 | 28 | 43 | 43 | 6 | 50 | 50 | 6 | 49 | 49 |
| g / C, Green / Cycle | 0.05 | 0.17 | 0.17 | 0.23 | 0.36 | 0.36 | 0.05 | 0.41 | 0.41 | 0.05 | 0.41 | 0.41 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.05 | 0.06 | 0.22 | 0.33 | 0.33 | 0.04 | 0.17 | 0.03 | 0.03 | 0.21 | 0.21 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 3500 | 1900 | 1900 | 3500 | 3800 | 1900 | 3500 | 3800 | 1900 |
| c, Capacity [veh/h] | 170 | 654 | 327 | 816 | 678 | 678 | 178 | 1565 | 782 | 173 | 1560 | 780 |
| d1, Uniform Delay [s] | 55.84 | 43.32 | 43.99 | 45.43 | 36.88 | 36.88 | 56.25 | 24.94 | 21.42 | 56.00 | 26.25 | 26.39 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.24 | 0.24 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 2.84 | 0.24 | 0.71 | 7.56 | 10.63 | 10.63 | 6.36 | 0.78 | 0.18 | 3.82 | 1.15 | 2.38 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.56 | 0.29 | 0.38 | 0.96 | 0.92 | 0.92 | 0.75 | 0.41 | 0.07 | 0.63 | 0.50 | 0.51 |
| d, Delay for Lane Group [s/veh] | 58.68 | 43.56 | 44.70 | 52.99 | 47.51 | 47.51 | 62.60 | 25.72 | 21.61 | 59.81 | 27.40 | 28.76 |
| Lane Group LOS | E | D | D | D | D | D | E | C | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | 1.48 | 2.51 | 3.32 | 12.26 | 19.10 | 19.10 | 2.16 | 6.54 | 1.04 | 1.73 | 8.48 | 8.95 |
| 50th-Percentile Queue Length [ft/ln] | 36.89 | 62.73 | 82.93 | 306.44 | 477.61 | 477.61 | 54.04 | 163.44 | 25.98 | 43.21 | 212.01 | 223.66 |
| 95th-Percentile Queue Length [veh/ln] | 2.66 | 4.52 | 5.97 | 18.00 | 26.27 | 26.27 | 3.89 | 10.73 | 1.87 | 3.11 | 13.26 | 13.85 |
| 95th-Percentile Queue Length [ft/ln] | 66.40 | 112.91 | 149.28 | 449.98 | 656.81 | 656.81 | 97.28 | 268.28 | 46.77 | 77.78 | 331.40 | 346.29 |

**Movement, Approach, & Intersection Results**

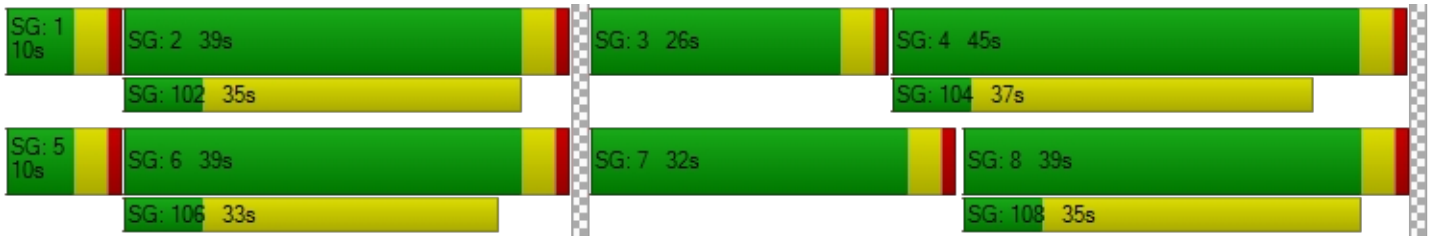
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 58.68 | 43.56 | 44.70 | 52.99 | 47.51 | 47.51 | 62.60 | 25.72 | 21.61 | 59.81 | 27.40 | 28.76 |
| Movement LOS | E | D | D | D | D | D | E | C | C | E | C | C |
| d_A, Approach Delay [s/veh] | 47.42 | | | 49.63 | | | 31.41 | | | 30.59 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 40.72 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.694 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 49.52 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.825 | 2.913 | 2.881 | 3.002 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 583 | 683 | 583 | 583 |
| d_b, Bicycle Delay [s] | 30.12 | 26.02 | 30.12 | 30.12 |
| l_b,int, Bicycle LOS Score for Intersection | 1.897 | 3.228 | 2.242 | 2.623 |
| Bicycle LOS | A | C | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 28.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.816 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 255 | 6 | 323 | 57 | 29 | 9 | 5 | 993 | 335 | 357 | 807 | 11 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 255 | 6 | 323 | 57 | 29 | 9 | 5 | 993 | 335 | 357 | 807 | 11 |
| Peak Hour Factor | 0.8160 | 0.8160 | 0.8160 | 0.7410 | 0.7410 | 0.7410 | 0.8560 | 0.8560 | 0.8560 | 0.9140 | 0.9140 | 0.9140 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 78 | 2 | 99 | 19 | 10 | 3 | 1 | 290 | 98 | 98 | 221 | 3 |
| Total Analysis Volume [veh/h] | 313 | 7 | 396 | 77 | 39 | 12 | 6 | 1160 | 391 | 391 | 883 | 12 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 6 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 30 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 24 | 61 | 61 | 0 | 37 | 0 | 10 | 38 | 0 | 21 | 49 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 7 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 26 | 0 | 26 | 0 | 0 | 27 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | No | | No | | No | No | | No | No | |
| Maximum Recall | No | No | No | | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | No | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 13 | 24 | 45 | 7 | 7 | 1 | 67 | 67 | 17 | 83 | 83 |
| g / C, Green / Cycle | 0.11 | 0.20 | 0.38 | 0.06 | 0.06 | 0.01 | 0.56 | 0.56 | 0.14 | 0.69 | 0.69 |
| (v / s)_i Volume / Saturation Flow Rate | 0.09 | 0.00 | 0.21 | 0.04 | 0.03 | 0.00 | 0.42 | 0.40 | 0.11 | 0.24 | 0.24 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 |
| c, Capacity [veh/h] | 382 | 385 | 718 | 137 | 114 | 18 | 1055 | 1055 | 497 | 1306 | 1306 |
| d1, Uniform Delay [s] | 52.31 | 38.29 | 29.33 | 55.39 | 54.48 | 59.03 | 20.46 | 19.67 | 49.75 | 7.69 | 7.68 |
| k, delay calibration | 0.11 | 0.11 | 0.33 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.35 | 0.02 | 2.01 | 3.56 | 2.71 | 10.37 | 5.05 | 4.13 | 2.81 | 0.72 | 0.71 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.82 | 0.02 | 0.55 | 0.56 | 0.45 | 0.33 | 0.76 | 0.71 | 0.79 | 0.34 | 0.34 |
| d, Delay for Lane Group [s/veh] | 56.66 | 38.31 | 31.34 | 58.95 | 57.19 | 69.40 | 25.51 | 23.80 | 52.56 | 8.41 | 8.39 |
| Lane Group LOS | E | D | C | E | E | E | C | C | D | A | A |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 4.84 | 0.17 | 9.34 | 2.43 | 1.58 | 0.23 | 17.87 | 16.09 | 5.86 | 4.67 | 4.64 |
| 50th-Percentile Queue Length [ft/ln] | 121.03 | 4.22 | 233.56 | 60.63 | 39.44 | 5.84 | 446.67 | 402.34 | 146.41 | 116.74 | 116.09 |
| 95th-Percentile Queue Length [veh/ln] | 8.45 | 0.30 | 14.36 | 4.37 | 2.84 | 0.42 | 24.80 | 22.67 | 9.83 | 8.21 | 8.18 |
| 95th-Percentile Queue Length [ft/ln] | 211.24 | 7.59 | 358.88 | 109.13 | 70.99 | 10.50 | 619.98 | 566.82 | 245.63 | 205.34 | 204.44 |

**Movement, Approach, & Intersection Results**

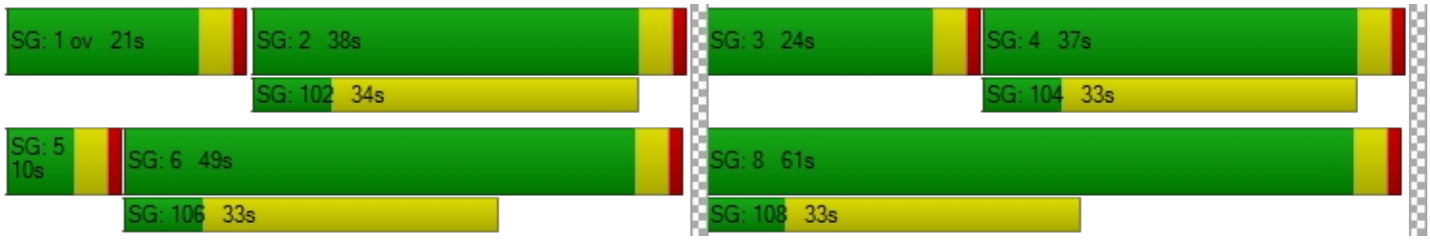
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 56.66 | 38.31 | 31.34 | 58.95 | 57.19 | 57.19 | 69.40 | 24.98 | 23.80 | 52.56 | 8.40 | 8.39 |
| Movement LOS | E | D | C | E | E | E | E | C | C | D | A | A |
| d_A, Approach Delay [s/veh] | 42.48 | | | 58.25 | | | 24.85 | | | 21.83 | | |
| Approach LOS | D | | | E | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 28.38 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.816 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 49.52 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.716 | 2.004 | 2.853 | 3.051 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 950 | 550 | 567 | 750 |
| d_b, Bicycle Delay [s] | 16.55 | 31.55 | 30.83 | 23.45 |
| l_b,int, Bicycle LOS Score for Intersection | 2.741 | 1.771 | 2.844 | 2.621 |
| Bicycle LOS | B | A | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 16.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.155 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 26 | 154 | 8 | 6 | 141 | 17 | 35 | 2 | 59 | 0 | 0 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 26 | 154 | 8 | 6 | 141 | 17 | 35 | 2 | 59 | 0 | 0 | 0 |
| Peak Hour Factor | 0.9010 | 0.9010 | 0.9010 | 0.6500 | 0.6500 | 0.6500 | 0.5970 | 0.5970 | 0.5970 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 43 | 2 | 2 | 54 | 7 | 15 | 1 | 25 | 0 | 0 | 0 |
| Total Analysis Volume [veh/h] | 29 | 171 | 9 | 9 | 217 | 26 | 59 | 3 | 99 | 0 | 0 | 0 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 26 | 0 | 10 | 26 | 0 | 0 | 54 | 0 | 0 | 54 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 12 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | L | C | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 3 | 70 | 70 | 1 | 68 | 68 | 7 | 7 | 7 | 7 |
| g / C, Green / Cycle | 0.04 | 0.78 | 0.78 | 0.01 | 0.75 | 0.75 | 0.08 | 0.08 | 0.08 | 0.08 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.05 | 0.05 | 0.01 | 0.06 | 0.06 | 0.03 | 0.05 | 0.00 | 0.00 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 64 | 1471 | 1471 | 26 | 1431 | 1431 | 185 | 148 | 93 | 148 |
| d1, Uniform Delay [s] | 42.56 | 2.41 | 2.41 | 43.93 | 2.93 | 2.93 | 39.59 | 40.46 | 0.00 | 0.00 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.91 | 0.08 | 0.08 | 7.37 | 0.12 | 0.12 | 0.98 | 5.63 | 0.00 | 0.00 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.45 | 0.06 | 0.06 | 0.34 | 0.09 | 0.08 | 0.32 | 0.69 | 0.00 | 0.00 |
| d, Delay for Lane Group [s/veh] | 47.47 | 2.49 | 2.49 | 51.30 | 3.05 | 3.04 | 40.56 | 46.09 | 0.00 | 0.00 |
| Lane Group LOS | D | A | A | D | A | A | D | D | A | A |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.71 | 0.29 | 0.29 | 0.25 | 0.47 | 0.47 | 1.28 | 2.41 | 0.00 | 0.00 |
| 50th-Percentile Queue Length [ft/ln] | 17.84 | 7.30 | 7.25 | 6.28 | 11.85 | 11.63 | 32.04 | 60.17 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [veh/ln] | 1.28 | 0.53 | 0.52 | 0.45 | 0.85 | 0.84 | 2.31 | 4.33 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln] | 32.12 | 13.15 | 13.05 | 11.30 | 21.32 | 20.94 | 57.68 | 108.31 | 0.00 | 0.00 |

**Movement, Approach, & Intersection Results**

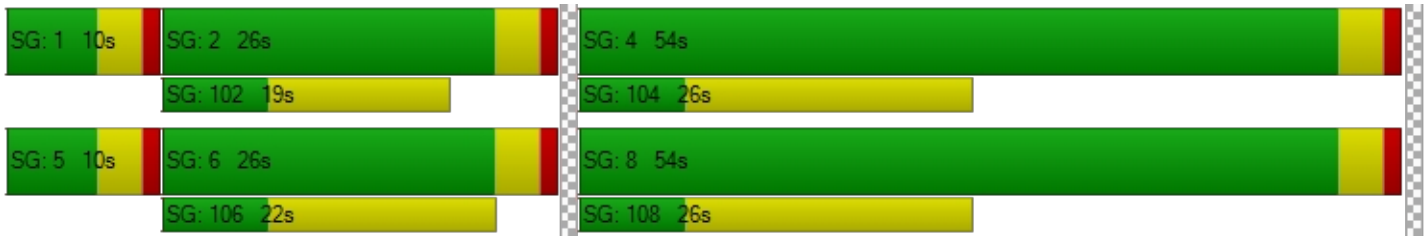
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 47.47 | 2.49 | 2.49 | 51.30 | 3.04 | 3.04 | 40.56 | 46.09 | 46.09 | 0.00 | 0.00 | 0.00 |
| Movement LOS | D | A | A | D | A | A | D | D | D | A | A | A |
| d_A, Approach Delay [s/veh] | 8.73 | | | 4.77 | | | 44.06 | | | 0.00 | | |
| Approach LOS | A | | | A | | | D | | | A | | |
| d_I, Intersection Delay [s/veh] | 16.27 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.155 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.402 | 2.477 | 2.010 | 1.947 |
| Crosswalk LOS | B | B | B | A |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 489 | 489 | 1111 | 1111 |
| d_b, Bicycle Delay [s] | 25.70 | 25.70 | 8.90 | 8.90 |
| l_b,int, Bicycle LOS Score for Intersection | 1.732 | 1.768 | 1.825 | 1.560 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 17.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.197 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 14 | 181 | 129 | 27 | 158 | 6 | 1 | 0 | 1 | 116 | 0 | 20 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 14 | 181 | 129 | 27 | 158 | 6 | 1 | 0 | 1 | 116 | 0 | 20 |
| Peak Hour Factor | 0.8280 | 0.8280 | 0.8280 | 0.9050 | 0.9050 | 0.9050 | 0.2500 | 0.2500 | 0.2500 | 0.6000 | 0.6000 | 0.6000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 55 | 39 | 7 | 44 | 2 | 1 | 0 | 1 | 48 | 0 | 8 |
| Total Analysis Volume [veh/h] | 17 | 219 | 156 | 30 | 175 | 7 | 4 | 0 | 4 | 193 | 0 | 33 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 29 | 0 | 10 | 29 | 0 | 0 | 30 | 0 | 0 | 31 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 17 | 0 | 0 | 18 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | C | R | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 0.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 78 | 71 | 71 | 78 | 72 | 72 | 1 | 1 | 9 | 9 |
| g / C, Green / Cycle | 0.78 | 0.71 | 0.71 | 0.78 | 0.72 | 0.72 | 0.01 | 0.01 | 0.09 | 0.09 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.10 | 0.09 | 0.02 | 0.05 | 0.05 | 0.00 | 0.00 | 0.06 | 0.06 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 1479 | 1341 | 1341 | 1442 | 1363 | 1363 | 23 | 24 | 157 | 165 |
| d1, Uniform Delay [s] | 2.43 | 4.82 | 4.77 | 2.45 | 4.20 | 4.20 | 48.89 | 48.89 | 44.54 | 44.31 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.00 | 0.23 | 0.21 | 0.03 | 0.09 | 0.09 | 3.66 | 3.25 | 6.40 | 4.73 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.01 | 0.15 | 0.13 | 0.02 | 0.07 | 0.07 | 0.18 | 0.17 | 0.73 | 0.67 |
| d, Delay for Lane Group [s/veh] | 2.44 | 5.05 | 4.98 | 2.48 | 4.29 | 4.29 | 52.55 | 52.14 | 50.94 | 49.04 |
| Lane Group LOS | A | A | A | A | A | A | D | D | D | D |
| Critical Lane Group | No | Yes | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.06 | 1.24 | 1.11 | 0.11 | 0.51 | 0.51 | 0.12 | 0.12 | 3.03 | 2.88 |
| 50th-Percentile Queue Length [ft/ln] | 1.40 | 30.96 | 27.87 | 2.71 | 12.75 | 12.68 | 3.04 | 3.00 | 75.68 | 72.08 |
| 95th-Percentile Queue Length [veh/ln] | 0.10 | 2.23 | 2.01 | 0.19 | 0.92 | 0.91 | 0.22 | 0.22 | 5.45 | 5.19 |
| 95th-Percentile Queue Length [ft/ln] | 2.53 | 55.73 | 50.16 | 4.87 | 22.96 | 22.83 | 5.46 | 5.40 | 136.22 | 129.74 |

**Movement, Approach, & Intersection Results**

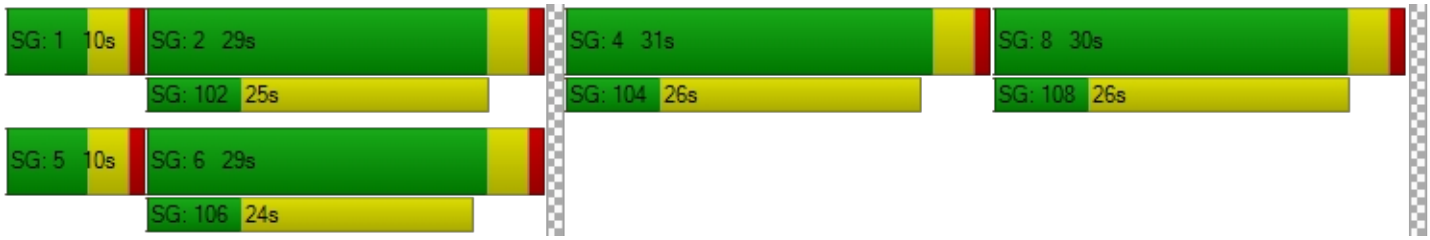
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 2.44 | 5.05 | 4.98 | 2.48 | 4.29 | 4.29 | 52.55 | 52.55 | 52.14 | 50.16 | 49.04 | 49.04 |
| Movement LOS | A | A | A | A | A | A | D | D | D | D | D | D |
| d_A, Approach Delay [s/veh] | 4.91 | | | 4.04 | | | 52.34 | | | 50.00 | | |
| Approach LOS | A | | | A | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 17.30 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.197 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 39.62 | 39.62 | 39.62 | 39.62 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.454 | 2.396 | 1.973 | 2.110 |
| Crosswalk LOS | B | B | A | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 500 | 500 | 520 | 540 |
| d_b, Bicycle Delay [s] | 28.14 | 28.14 | 27.40 | 26.66 |
| l_b,int, Bicycle LOS Score for Intersection | 1.883 | 1.735 | 1.573 | 1.933 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 20.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.301 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 33 | 9 | 16 | 17 | 6 | 67 | 149 | 269 | 16 | 28 | 381 | 26 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 33 | 9 | 16 | 17 | 6 | 67 | 149 | 269 | 16 | 28 | 381 | 26 |
| Peak Hour Factor | 0.5830 | 0.5830 | 0.5830 | 0.5500 | 0.5500 | 0.5500 | 0.8240 | 0.8240 | 0.8240 | 0.9420 | 0.9420 | 0.9420 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 14 | 4 | 7 | 8 | 3 | 30 | 45 | 82 | 5 | 7 | 101 | 7 |
| Total Analysis Volume [veh/h] | 57 | 15 | 27 | 31 | 11 | 122 | 181 | 326 | 19 | 30 | 404 | 28 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 6 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 30 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 37 | 0 | 0 | 10 | 10 | 21 | 36 | 0 | 17 | 32 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 21 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | No | No | No | | No | No | |
| Maximum Recall | | No | | | No | No | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | No | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | C | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 6 | 6 | 6 | 6 | 27 | 8 | 69 | 69 | 3 | 65 | 65 |
| g / C, Green / Cycle | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.27 | 0.08 | 0.69 | 0.69 | 0.03 | 0.65 | 0.65 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.03 | 0.01 | 0.02 | 0.01 | 0.06 | 0.05 | 0.09 | 0.09 | 0.02 | 0.11 | 0.11 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 1900 | 1900 |
| c, Capacity [veh/h] | 144 | 164 | 109 | 110 | 116 | 522 | 269 | 1306 | 1306 | 63 | 1226 | 1226 |
| d1, Uniform Delay [s] | 45.05 | 45.80 | 45.15 | 44.94 | 44.42 | 28.14 | 44.99 | 5.40 | 5.39 | 47.40 | 7.11 | 7.10 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.47 | 1.06 | 1.18 | 1.40 | 0.35 | 0.23 | 2.91 | 0.21 | 0.21 | 5.43 | 0.32 | 0.31 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.15 | 0.31 | 0.25 | 0.28 | 0.10 | 0.23 | 0.67 | 0.13 | 0.13 | 0.47 | 0.18 | 0.17 |
| d, Delay for Lane Group [s/veh] | 45.51 | 46.86 | 46.34 | 46.33 | 44.77 | 28.37 | 47.91 | 5.61 | 5.59 | 52.83 | 7.43 | 7.41 |
| Lane Group LOS | D | D | D | D | D | C | D | A | A | D | A | A |
| Critical Lane Group | No | Yes | No | No | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.52 | 1.27 | 0.67 | 0.78 | 0.27 | 2.29 | 2.28 | 1.18 | 1.16 | 0.83 | 1.81 | 1.78 |
| 50th-Percentile Queue Length [ft/ln] | 13.05 | 31.64 | 16.87 | 19.38 | 6.71 | 57.25 | 57.09 | 29.54 | 29.05 | 20.65 | 45.37 | 44.53 |
| 95th-Percentile Queue Length [veh/ln] | 0.94 | 2.28 | 1.21 | 1.40 | 0.48 | 4.12 | 4.11 | 2.13 | 2.09 | 1.49 | 3.27 | 3.21 |
| 95th-Percentile Queue Length [ft/ln] | 23.48 | 56.95 | 30.37 | 34.89 | 12.08 | 103.05 | 102.77 | 53.17 | 52.28 | 37.18 | 81.67 | 80.15 |

**Movement, Approach, & Intersection Results**

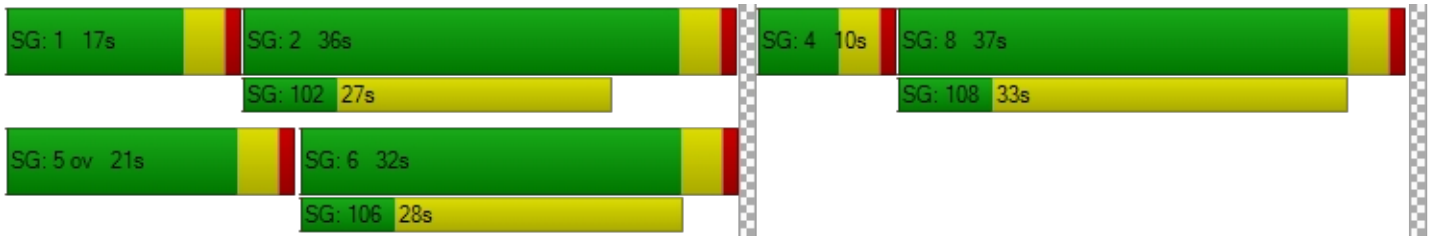
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 46.30 | 46.86 | 46.34 | 46.33 | 44.77 | 28.37 | 47.91 | 5.60 | 5.59 | 52.83 | 7.42 | 7.41 |
| Movement LOS | D | D | D | D | D | C | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 46.43 | | | 32.87 | | | 20.16 | | | 10.37 | | |
| Approach LOS | D | | | C | | | C | | | B | | |
| d_I, Intersection Delay [s/veh] | 20.29 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.301 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 39.64 | 39.64 | 0.00 | 39.64 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.336 | 2.380 | 0.000 | 2.470 |
| Crosswalk LOS | B | B | F | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 660 | 120 | 640 | 560 |
| d_b, Bicycle Delay [s] | 22.48 | 44.22 | 23.15 | 25.95 |
| l_b,int, Bicycle LOS Score for Intersection | 1.723 | 1.695 | 1.994 | 1.941 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 46.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.935 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 314 | 712 | 279 | 175 | 1318 | 318 | 289 | 1408 | 375 | 313 | 1259 | 266 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 314 | 712 | 279 | 175 | 1318 | 318 | 289 | 1408 | 375 | 313 | 1259 | 266 |
| Peak Hour Factor | 0.8230 | 0.8230 | 0.8230 | 0.9630 | 0.9630 | 0.9630 | 0.8630 | 0.8630 | 0.8630 | 0.9800 | 0.9800 | 0.9800 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 95 | 216 | 85 | 45 | 342 | 83 | 84 | 408 | 109 | 80 | 321 | 68 |
| Total Analysis Volume [veh/h] | 382 | 865 | 339 | 182 | 1369 | 330 | 335 | 1632 | 435 | 319 | 1285 | 271 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 115 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 17 | 44 | 0 | 12 | 39 | 0 | 17 | 43 | 0 | 16 | 42 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 31 | 0 | 0 | 28 | 0 | 0 | 31 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 13 | 37 | 37 | 8 | 32 | 32 | 13 | 42 | 42 | 12 | 41 | 41 |
| g / C, Green / Cycle | 0.11 | 0.32 | 0.32 | 0.07 | 0.28 | 0.28 | 0.11 | 0.36 | 0.36 | 0.10 | 0.36 | 0.36 |
| (v / s)_i Volume / Saturation Flow Rate | 0.11 | 0.15 | 0.18 | 0.05 | 0.24 | 0.17 | 0.10 | 0.36 | 0.36 | 0.09 | 0.23 | 0.14 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 397 | 1837 | 612 | 242 | 1584 | 528 | 393 | 1386 | 693 | 367 | 2037 | 679 |
| d1, Uniform Delay [s] | 50.76 | 31.15 | 32.17 | 52.61 | 39.50 | 36.32 | 50.16 | 36.53 | 36.24 | 50.73 | 30.67 | 27.71 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.14 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 13.63 | 0.19 | 0.78 | 4.71 | 1.53 | 1.59 | 5.33 | 23.93 | 30.67 | 6.34 | 1.50 | 1.75 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.96 | 0.47 | 0.55 | 0.75 | 0.86 | 0.63 | 0.85 | 1.00 | 0.98 | 0.87 | 0.63 | 0.40 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 64.39 | 31.34 | 32.95 | 57.32 | 41.03 | 37.91 | 55.48 | 60.46 | 66.91 | 57.07 | 32.17 | 29.46 |
| Lane Group LOS | E | C | C | E | D | D | E | E | E | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 6.21 | 6.40 | 7.87 | 2.74 | 12.34 | 8.29 | 5.01 | 23.58 | 24.46 | 4.84 | 10.05 | 5.91 |
| 50th-Percentile Queue Length [ft/ln] | 155.23 | 160.12 | 196.73 | 68.45 | 308.49 | 207.24 | 125.33 | 589.53 | 611.45 | 120.97 | 251.13 | 147.76 |
| 95th-Percentile Queue Length [veh/ln] | 10.30 | 10.56 | 12.47 | 4.93 | 18.10 | 13.01 | 8.68 | 31.55 | 32.57 | 8.45 | 15.24 | 9.90 |
| 95th-Percentile Queue Length [ft/ln] | 257.39 | 263.88 | 311.74 | 123.21 | 452.52 | 325.29 | 217.12 | 788.63 | 814.21 | 211.16 | 381.08 | 247.43 |

**Movement, Approach, & Intersection Results**

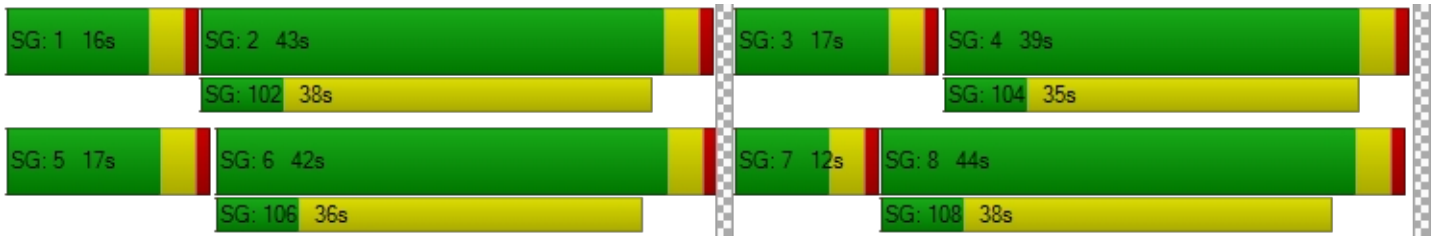
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 64.39 | 31.34 | 32.95 | 57.32 | 41.03 | 37.91 | 55.48 | 61.44 | 66.91 | 57.07 | 32.17 | 29.46 |
| Movement LOS | E | C | C | E | D | D | E | E | E | E | C | C |
| d_A, Approach Delay [s/veh] | 39.64 | | | 42.06 | | | 61.60 | | | 36.01 | | |
| Approach LOS | D | | | D | | | E | | | D | | |
| d_I, Intersection Delay [s/veh] | 46.16 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.935 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 47.05 | 47.05 | 47.05 | 47.05 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.263 | 3.224 | 3.273 | 3.297 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 695 | 608 | 678 | 661 |
| d_b, Bicycle Delay [s] | 24.47 | 27.84 | 25.13 | 25.80 |
| l_b,int, Bicycle LOS Score for Intersection | 2.432 | 2.594 | 2.881 | 2.591 |
| Bicycle LOS | B | B | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 20.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.595 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 61 | 118 | 161 | 141 | 87 | 148 | 234 | 1465 | 81 | 53 | 1497 | 175 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 61 | 118 | 161 | 141 | 87 | 148 | 234 | 1465 | 81 | 53 | 1497 | 175 |
| Peak Hour Factor | 0.8950 | 0.8950 | 0.8950 | 0.8510 | 0.8510 | 0.8510 | 0.8710 | 0.8710 | 0.8710 | 0.9670 | 0.9670 | 0.9670 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 17 | 33 | 45 | 41 | 26 | 43 | 67 | 420 | 23 | 14 | 387 | 45 |
| Total Analysis Volume [veh/h] | 68 | 132 | 180 | 166 | 102 | 174 | 269 | 1682 | 93 | 55 | 1548 | 181 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 39 | 0 | 0 | 39 | 0 | 17 | 32 | 0 | 19 | 34 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 23 | 0 | 0 | 17 | 0 | 0 | 23 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 11 | 11 | 11 | 11 | 11 | 11 | 13 | 62 | 62 | 5 | 54 | 54 |
| g / C, Green / Cycle | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.14 | 0.69 | 0.69 | 0.05 | 0.60 | 0.60 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.07 | 0.09 | 0.09 | 0.03 | 0.09 | 0.15 | 0.31 | 0.32 | 0.03 | 0.27 | 0.10 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 224 | 235 | 235 | 151 | 471 | 235 | 261 | 2629 | 1315 | 92 | 3407 | 1136 |
| d1, Uniform Delay [s] | 35.91 | 37.14 | 38.17 | 37.72 | 35.51 | 38.04 | 38.49 | 6.18 | 6.26 | 41.83 | 10.00 | 8.05 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.75 | 2.09 | 5.12 | 64.76 | 0.23 | 4.51 | 33.84 | 0.55 | 1.15 | 6.13 | 0.44 | 0.30 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.30 | 0.56 | 0.76 | 1.10 | 0.22 | 0.74 | 1.03 | 0.45 | 0.46 | 0.60 | 0.45 | 0.16 |
| d, Delay for Lane Group [s/veh] | 36.67 | 39.22 | 43.29 | 102.48 | 35.74 | 42.55 | 72.33 | 6.73 | 7.41 | 47.96 | 10.44 | 8.35 |
| Lane Group LOS | D | D | D | F | D | D | F | A | A | D | B | A |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 1.39 | 2.84 | 4.12 | 5.85 | 1.01 | 3.94 | 8.11 | 4.27 | 4.65 | 1.34 | 5.21 | 1.53 |
| 50th-Percentile Queue Length [ft/ln] | 34.79 | 70.90 | 102.97 | 146.22 | 25.31 | 98.50 | 202.71 | 106.83 | 116.33 | 33.50 | 130.28 | 38.18 |
| 95th-Percentile Queue Length [veh/ln] | 2.51 | 5.10 | 7.41 | 10.17 | 1.82 | 7.09 | 12.95 | 7.66 | 8.19 | 2.41 | 8.96 | 2.75 |
| 95th-Percentile Queue Length [ft/ln] | 62.63 | 127.62 | 185.34 | 254.37 | 45.55 | 177.29 | 323.65 | 191.58 | 204.78 | 60.30 | 223.88 | 68.73 |

**Movement, Approach, & Intersection Results**

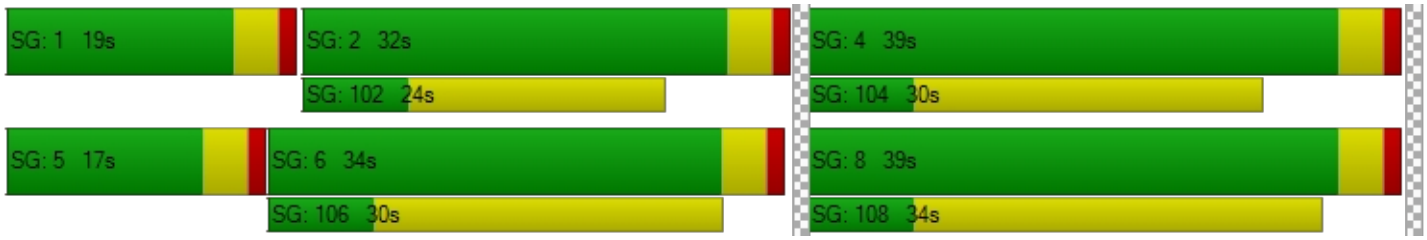
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 36.67 | 39.22 | 43.29 | 102.48 | 35.74 | 42.55 | 72.33 | 6.94 | 7.41 | 47.96 | 10.44 | 8.35 |
| Movement LOS | D | D | D | F | D | D | F | A | A | D | B | A |
| d_A, Approach Delay [s/veh] | 40.69 | | | 63.49 | | | 15.57 | | | 11.39 | | |
| Approach LOS | D | | | E | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 20.57 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.595 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.422 | 2.499 | 3.224 | 3.426 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 778 | 778 | 622 | 666 |
| d_b, Bicycle Delay [s] | 16.82 | 16.82 | 21.37 | 20.01 |
| l_b,int, Bicycle LOS Score for Intersection | 2.187 | 1.924 | 2.684 | 2.541 |
| Bicycle LOS | B | A | B | B |

## Sequence

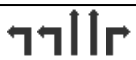
| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 48.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.973 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 450 | 501 | 172 | 172 | 1032 | 209 | 166 | 1630 | 367 | 180 | 1708 | 116 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 450 | 501 | 172 | 172 | 1032 | 209 | 166 | 1630 | 367 | 180 | 1708 | 116 |
| Peak Hour Factor | 0.7960 | 0.7960 | 0.7960 | 0.9500 | 0.9500 | 0.9500 | 0.9210 | 0.9210 | 0.9210 | 0.8690 | 0.8690 | 0.8690 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 141 | 157 | 54 | 45 | 272 | 55 | 45 | 442 | 100 | 52 | 491 | 33 |
| Total Analysis Volume [veh/h] | 565 | 629 | 216 | 181 | 1086 | 220 | 180 | 1770 | 398 | 207 | 1965 | 133 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 24 | 41 | 0 | 22 | 39 | 0 | 11 | 45 | 0 | 12 | 46 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 20 | 47 | 47 | 8 | 35 | 35 | 7 | 41 | 41 | 8 | 42 | 42 |
| g / C, Green / Cycle | 0.17 | 0.39 | 0.39 | 0.07 | 0.29 | 0.29 | 0.06 | 0.34 | 0.34 | 0.07 | 0.35 | 0.35 |
| (v / s)_i Volume / Saturation Flow Rate | 0.16 | 0.11 | 0.11 | 0.05 | 0.29 | 0.12 | 0.05 | 0.31 | 0.21 | 0.06 | 0.34 | 0.07 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 584 | 2208 | 736 | 245 | 1104 | 552 | 205 | 1952 | 651 | 234 | 2000 | 667 |
| d1, Uniform Delay [s] | 49.69 | 25.32 | 25.41 | 54.73 | 42.28 | 34.15 | 56.07 | 37.63 | 32.82 | 55.54 | 38.60 | 27.19 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 11.33 | 0.07 | 0.22 | 4.32 | 9.28 | 0.47 | 11.40 | 7.59 | 4.25 | 10.61 | 16.44 | 0.67 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.97 | 0.28 | 0.29 | 0.74 | 0.98 | 0.40 | 0.88 | 0.91 | 0.61 | 0.88 | 0.98 | 0.20 |
| d, Delay for Lane Group [s/veh] | 61.02 | 25.39 | 25.63 | 59.05 | 51.55 | 34.61 | 67.48 | 45.22 | 37.07 | 66.15 | 55.04 | 27.87 |
| Lane Group LOS | E | C | C | E | D | C | E | D | D | E | E | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 9.30 | 4.14 | 4.32 | 2.83 | 17.20 | 5.23 | 3.03 | 17.67 | 10.36 | 3.45 | 21.81 | 2.81 |
| 50th-Percentile Queue Length [ft/ln] | 232.62 | 103.60 | 107.88 | 70.77 | 429.91 | 130.84 | 75.72 | 441.77 | 258.95 | 86.24 | 545.14 | 70.22 |
| 95th-Percentile Queue Length [veh/ln] | 14.31 | 7.46 | 7.72 | 5.10 | 24.00 | 8.99 | 5.45 | 24.56 | 15.64 | 6.21 | 29.46 | 5.06 |
| 95th-Percentile Queue Length [ft/ln] | 357.68 | 186.47 | 193.04 | 127.38 | 599.93 | 224.63 | 136.29 | 614.12 | 390.91 | 155.24 | 736.59 | 126.39 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 61.02 | 25.39 | 25.63 | 59.05 | 51.55 | 34.61 | 67.48 | 45.22 | 37.07 | 66.15 | 55.04 | 27.87 |
| Movement LOS | E | C | C | E | D | C | E | D | D | E | E | C |
| d_A, Approach Delay [s/veh] | 39.70 | | | 49.96 | | | 45.54 | | | 54.47 | | |
| Approach LOS | D | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 48.05 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.973 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.51 | 49.51 | 49.51 | 49.51 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.117 | 3.035 | 3.415 | 3.347 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 617 | 583 | 683 | 700 |
| d_b, Bicycle Delay [s] | 28.71 | 30.11 | 26.01 | 25.35 |
| l_b,int, Bicycle LOS Score for Intersection | 2.335 | 2.786 | 2.851 | 2.827 |
| Bicycle LOS | B | C | C | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 16.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.612 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 37 | 19 | 68 | 185 | 21 | 69 | 104 | 1683 | 26 | 41 | 1790 | 172 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 37 | 19 | 68 | 185 | 21 | 69 | 104 | 1683 | 26 | 41 | 1790 | 172 |
| Peak Hour Factor | 0.7700 | 0.7700 | 0.7700 | 0.8070 | 0.8070 | 0.8070 | 0.8950 | 0.8950 | 0.8950 | 0.8510 | 0.8510 | 0.8510 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 12 | 6 | 22 | 57 | 7 | 21 | 29 | 470 | 7 | 12 | 526 | 51 |
| Total Analysis Volume [veh/h] | 48 | 25 | 88 | 229 | 26 | 86 | 116 | 1880 | 29 | 48 | 2103 | 202 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 10 | 0 | 0 | 40 | 0 | 10 | 40 | 0 | 10 | 40 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 28 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 7 | 7 | 7 | 9 | 9 | 6 | 63 | 63 | 4 | 62 | 62 |
| g / C, Green / Cycle | 0.07 | 0.07 | 0.07 | 0.09 | 0.09 | 0.06 | 0.63 | 0.63 | 0.04 | 0.62 | 0.62 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.01 | 0.05 | 0.07 | 0.06 | 0.03 | 0.33 | 0.34 | 0.03 | 0.37 | 0.11 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 3500 | 1900 | 3500 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 124 | 124 | 131 | 328 | 178 | 205 | 2402 | 1201 | 82 | 3528 | 1176 |
| d1, Uniform Delay [s] | 44.58 | 44.00 | 45.50 | 44.01 | 43.70 | 45.90 | 10.11 | 10.34 | 46.88 | 11.52 | 8.14 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.95 | 0.79 | 5.81 | 2.69 | 3.63 | 2.45 | 0.82 | 1.78 | 6.58 | 0.75 | 0.32 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.39 | 0.20 | 0.67 | 0.70 | 0.63 | 0.57 | 0.52 | 0.54 | 0.59 | 0.60 | 0.17 |
| d, Delay for Lane Group [s/veh] | 46.54 | 44.79 | 51.31 | 46.70 | 47.33 | 48.35 | 10.93 | 12.11 | 53.47 | 12.27 | 8.45 |
| Lane Group LOS | D | D | D | D | D | D | B | B | D | B | A |
| Critical Lane Group | No | No | Yes | Yes | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 1.20 | 0.61 | 2.33 | 2.86 | 2.84 | 1.47 | 7.11 | 7.89 | 1.32 | 8.77 | 1.84 |
| 50th-Percentile Queue Length [ft/ln] | 30.05 | 15.26 | 58.36 | 71.43 | 70.90 | 36.68 | 177.79 | 197.16 | 32.91 | 219.24 | 45.95 |
| 95th-Percentile Queue Length [veh/ln] | 2.16 | 1.10 | 4.20 | 5.14 | 5.10 | 2.64 | 11.48 | 12.49 | 2.37 | 13.63 | 3.31 |
| 95th-Percentile Queue Length [ft/ln] | 54.09 | 27.47 | 105.05 | 128.58 | 127.61 | 66.03 | 287.12 | 312.30 | 59.24 | 340.66 | 82.72 |

**Movement, Approach, & Intersection Results**

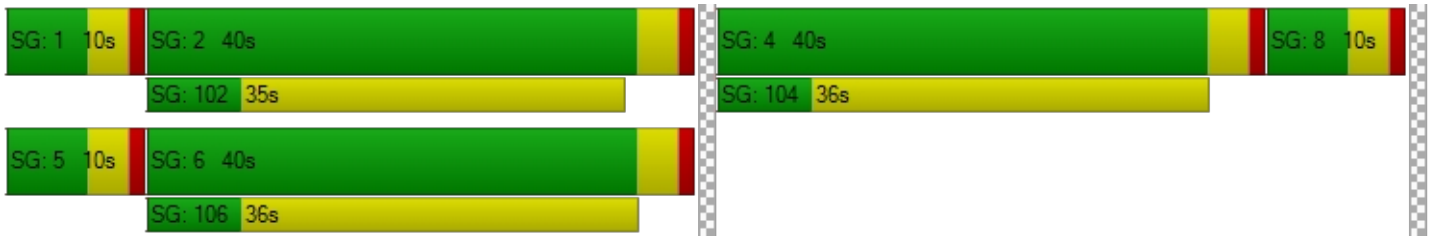
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 46.54 | 44.79 | 51.31 | 46.70 | 47.33 | 47.33 | 48.35 | 11.32 | 12.11 | 53.47 | 12.27 | 8.45 |
| Movement LOS | D | D | D | D | D | D | D | B | B | D | B | A |
| d_A, Approach Delay [s/veh] | 48.87 | | | 46.91 | | | 13.46 | | | 12.78 | | |
| Approach LOS | D | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 16.64 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.612 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 39.64 | 39.64 | 39.64 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.200 | 2.438 | 3.250 | 0.000 |
| Crosswalk LOS | B | B | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 120 | 719 | 719 | 719 |
| d_b, Bicycle Delay [s] | 44.22 | 20.51 | 20.51 | 20.51 |
| l_b,int, Bicycle LOS Score for Intersection | 1.692 | 2.122 | 2.673 | 2.854 |
| Bicycle LOS | A | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 36.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.875 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 119 | 178 | 429 | 126 | 407 | 28 | 35 | 1725 | 204 | 462 | 1859 | 196 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 119 | 178 | 429 | 126 | 407 | 28 | 35 | 1725 | 204 | 462 | 1859 | 196 |
| Peak Hour Factor | 0.9050 | 0.9050 | 0.9050 | 0.9420 | 0.9420 | 0.9420 | 0.9090 | 0.9090 | 0.9090 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 33 | 49 | 119 | 33 | 108 | 7 | 10 | 474 | 56 | 128 | 516 | 54 |
| Total Analysis Volume [veh/h] | 131 | 197 | 474 | 134 | 432 | 30 | 39 | 1898 | 224 | 513 | 2066 | 218 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 110 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 15 | 42 | 0 | 12 | 39 | 0 | 10 | 34 | 0 | 22 | 46 | 46 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 23 | 0 | 0 | 23 | 23 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 6 | 30 | 30 | 8 | 32 | 32 | 4 | 38 | 38 | 18 | 52 | 64 |
| g / C, Green / Cycle | 0.06 | 0.27 | 0.27 | 0.07 | 0.29 | 0.29 | 0.04 | 0.35 | 0.35 | 0.16 | 0.47 | 0.58 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.05 | 0.25 | 0.07 | 0.12 | 0.12 | 0.01 | 0.28 | 0.28 | 0.15 | 0.36 | 0.11 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 2000 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 195 | 1037 | 518 | 147 | 552 | 552 | 136 | 1970 | 657 | 570 | 2676 | 1101 |
| d1, Uniform Delay [s] | 50.98 | 30.71 | 38.79 | 50.66 | 31.60 | 31.52 | 51.42 | 32.63 | 32.97 | 45.20 | 24.30 | 11.01 |
| k, delay calibration | 0.11 | 0.11 | 0.26 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 3.94 | 0.09 | 13.99 | 18.69 | 0.52 | 0.50 | 1.14 | 3.57 | 11.27 | 5.46 | 2.23 | 0.40 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.67 | 0.19 | 0.91 | 0.91 | 0.42 | 0.41 | 0.29 | 0.80 | 0.82 | 0.90 | 0.77 | 0.20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 54.92 | 30.79 | 52.78 | 69.35 | 32.12 | 32.02 | 52.55 | 36.20 | 44.24 | 50.65 | 26.53 | 11.41 |
| Lane Group LOS | D | C | D | E | C | C | D | D | D | D | C | B |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 1.88 | 2.02 | 14.23 | 2.21 | 5.08 | 4.97 | 0.54 | 13.13 | 15.01 | 7.26 | 14.93 | 2.58 |
| 50th-Percentile Queue Length [ft/ln] | 46.89 | 50.55 | 355.76 | 55.22 | 126.96 | 124.16 | 13.61 | 328.17 | 375.13 | 181.46 | 373.36 | 64.46 |
| 95th-Percentile Queue Length [veh/ln] | 3.38 | 3.64 | 20.42 | 3.98 | 8.77 | 8.62 | 0.98 | 19.07 | 21.36 | 11.68 | 21.27 | 4.64 |
| 95th-Percentile Queue Length [ft/ln] | 84.40 | 90.99 | 510.42 | 99.40 | 219.36 | 215.53 | 24.49 | 476.72 | 533.94 | 291.92 | 531.80 | 116.02 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 54.92 | 30.79 | 52.78 | 69.35 | 32.07 | 32.02 | 52.55 | 37.54 | 44.24 | 50.65 | 26.53 | 11.41 |
| Movement LOS | D | C | D | E | C | C | D | D | D | D | C | B |
| d_A, Approach Delay [s/veh] | 47.73 | | | 40.45 | | | 38.51 | | | 29.78 | | |
| Approach LOS | D | | | D | | | D | | | C | | |
| d_I, Intersection Delay [s/veh] | 36.01 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.875 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 44.58 | 44.58 | 44.58 | 44.58 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.878 | 2.633 | 3.334 | 3.493 |
| Crosswalk LOS | C | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 691 | 636 | 545 | 763 |
| d_b, Bicycle Delay [s] | 23.59 | 25.59 | 29.11 | 21.04 |
| l_b,int, Bicycle LOS Score for Intersection | 2.221 | 2.051 | 2.451 | 3.098 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 16.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.683 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 611 | 0 | 521 | 0 | 1581 | 749 | 0 | 2020 | 202 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 611 | 0 | 521 | 0 | 1581 | 749 | 0 | 2020 | 202 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 0.8810 | 1.0000 | 0.8810 | 1.0000 | 0.9270 | 0.9270 | 1.0000 | 0.9400 | 0.9400 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 173 | 0 | 148 | 0 | 426 | 202 | 0 | 537 | 54 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 694 | 0 | 591 | 0 | 1706 | 808 | 0 | 2149 | 215 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_di, Inbound Pedestrian Volume crossing m | | 0 | | | 0 | | | 0 | | | 0 | |
| v_co, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ci, Inbound Pedestrian Volume crossing mi | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ab, Corner Pedestrian Volume [ped/h] | | 0 | | | 0 | | | 0 | | | 0 | |
| Bicycle Volume [bicycles/h] | | 0 | | | 0 | | | 0 | | | 0 | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 8.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 64 | 0 | 0 | 0 | 26 | 0 | 0 | 26 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | | No | |
| Maximum Recall | | | | No | | | | No | | | No | |
| Pedestrian Recall | | | | No | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | C | R | C | C |
|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 26 | 26 | 26 | 56 | 56 |
| g / C, Green / Cycle | | 0.29 | 0.29 | 0.29 | 0.62 | 0.62 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.24 | 0.24 | 0.23 | 0.30 | 0.38 |
| s, saturation flow rate [veh/h] | | 1750 | 1750 | 1900 | 5700 | 5700 |
| c, Capacity [veh/h] | | 513 | 513 | 557 | 3522 | 3522 |
| d1, Uniform Delay [s] | | 29.73 | 29.73 | 28.99 | 9.35 | 10.52 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 3.67 | 3.67 | 2.28 | 0.48 | 0.80 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.84 | 0.84 | 0.77 | 0.48 | 0.61 |
| d, Delay for Lane Group [s/veh] | | 33.40 | 33.40 | 31.27 | 9.83 | 11.32 |
| Lane Group LOS | | C | C | C | A | B |
| Critical Lane Group | | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | | 8.89 | 8.89 | 8.52 | 5.57 | 7.93 |
| 50th-Percentile Queue Length [ft/ln] | | 222.34 | 222.34 | 212.88 | 139.24 | 198.23 |
| 95th-Percentile Queue Length [veh/ln] | | 13.78 | 13.78 | 13.30 | 9.44 | 12.55 |
| 95th-Percentile Queue Length [ft/ln] | | 344.61 | 344.61 | 332.52 | 236.00 | 313.68 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 33.40 | 0.00 | 31.86 | 0.00 | 9.83 | 0.00 | 0.00 | 11.32 | 0.00 |
| Movement LOS | | | | C | | C | | A | | | B | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 32.69 | | | 9.83 | | | 11.32 | | |
| Approach LOS | A | | | C | | | A | | | B | | |
| d_I, Intersection Delay [s/veh] | 16.17 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.683 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 0.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 0.00 | 34.63 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 0.000 | 2.444 | 0.000 | 0.000 |
| Crosswalk LOS | F | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 1335 | 489 | 489 |
| d_b, Bicycle Delay [s] | 44.96 | 4.98 | 25.65 | 25.65 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 3.680 | 2.498 | 2.742 |
| Bicycle LOS | D | D | B | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 22.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.699 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1044 | 31 | 850 | 0 | 0 | 87 | 100 | 1463 | 570 | 0 | 1583 | 14 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1044 | 31 | 850 | 0 | 0 | 87 | 100 | 1463 | 570 | 0 | 1583 | 14 |
| Peak Hour Factor | 0.9080 | 0.9080 | 0.9080 | 1.0000 | 1.0000 | 0.6820 | 0.8790 | 0.8790 | 0.8790 | 1.0000 | 0.8940 | 0.8940 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 287 | 9 | 234 | 0 | 0 | 32 | 28 | 416 | 162 | 0 | 443 | 4 |
| Total Analysis Volume [veh/h] | 1150 | 34 | 936 | 0 | 0 | 128 | 114 | 1664 | 648 | 0 | 1771 | 16 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 0 | 6 | 6 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 49 | 0 | 0 | 0 | 11 | 11 | 41 | 0 | 0 | 30 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | | No | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | | No | No | No | | | No | |
| Maximum Recall | | No | | | | No | No | No | | | No | |
| Pedestrian Recall | | No | | | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 34 | 34 | 34 | 7 | 7 | 48 | 37 | 37 |
| g / C, Green / Cycle | 0.38 | 0.38 | 0.38 | 0.08 | 0.08 | 0.53 | 0.41 | 0.41 |
| (v / s)_i Volume / Saturation Flow Rate | 0.30 | 0.31 | 0.28 | 0.03 | 0.06 | 0.29 | 0.24 | 0.24 |
| s, saturation flow rate [veh/h] | 3500 | 1750 | 1900 | 3800 | 1800 | 5700 | 5700 | 1900 |
| c, Capacity [veh/h] | 1329 | 664 | 721 | 299 | 142 | 3030 | 2328 | 776 |
| d1, Uniform Delay [s] | 24.70 | 25.02 | 24.17 | 39.55 | 40.80 | 13.95 | 20.60 | 20.60 |
| k, delay calibration | 0.11 | 0.18 | 0.14 | 0.11 | 0.11 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.06 | 3.91 | 2.03 | 0.97 | 10.13 | 0.72 | 1.04 | 3.10 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.79 | 0.81 | 0.75 | 0.43 | 0.80 | 0.55 | 0.58 | 0.58 |
| d, Delay for Lane Group [s/veh] | 25.76 | 28.93 | 26.20 | 40.51 | 50.92 | 14.68 | 21.65 | 23.70 |
| Lane Group LOS | C | C | C | D | D | B | C | C |
| Critical Lane Group | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 9.60 | 10.53 | 9.88 | 1.38 | 2.85 | 7.12 | 7.17 | 7.62 |
| 50th-Percentile Queue Length [ft/ln] | 239.98 | 263.25 | 247.07 | 34.40 | 71.32 | 177.93 | 179.32 | 190.39 |
| 95th-Percentile Queue Length [veh/ln] | 14.68 | 15.85 | 15.04 | 2.48 | 5.14 | 11.49 | 11.57 | 12.14 |
| 95th-Percentile Queue Length [ft/ln] | 367.00 | 396.30 | 375.96 | 61.91 | 128.38 | 287.31 | 289.13 | 303.54 |

**Movement, Approach, & Intersection Results**

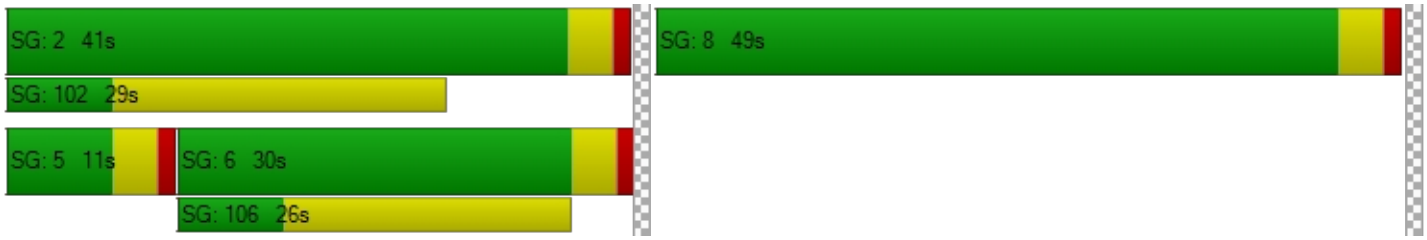
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 26.02 | 28.93 | 27.38 | 0.00 | 0.00 | 40.51 | 50.92 | 14.68 | 0.00 | 0.00 | 22.15 | 23.70 |
| Movement LOS | C | C | C | | | D | D | B | | | C | C |
| d_A, Approach Delay [s/veh] | 26.68 | | | 40.51 | | | 17.00 | | | 22.16 | | |
| Approach LOS | C | | | D | | | B | | | C | | |
| d_I, Intersection Delay [s/veh] | 22.63 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.699 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.713 | 2.035 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1000 | 156 | 822 | 578 |
| d_b, Bicycle Delay [s] | 11.26 | 38.28 | 15.62 | 22.77 |
| l_b,int, Bicycle LOS Score for Intersection | 5.058 | 1.560 | 2.538 | 2.297 |
| Bicycle LOS | F | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 32.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.813 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 154 | 211 | 73 | 170 | 335 | 168 | 217 | 1962 | 106 | 93 | 1698 | 102 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 154 | 211 | 73 | 170 | 335 | 168 | 217 | 1962 | 106 | 93 | 1698 | 102 |
| Peak Hour Factor | 0.8870 | 0.8870 | 0.8870 | 0.9320 | 0.9320 | 0.9320 | 0.9120 | 0.9120 | 0.9120 | 0.9620 | 0.9620 | 0.9620 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 43 | 59 | 21 | 46 | 90 | 45 | 59 | 538 | 29 | 24 | 441 | 27 |
| Total Analysis Volume [veh/h] | 174 | 238 | 82 | 182 | 359 | 180 | 238 | 2151 | 116 | 97 | 1765 | 106 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 115 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 11 | 39 | 0 | 12 | 40 | 0 | 21 | 53 | 0 | 11 | 43 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 29 | 0 | 0 | 26 | 0 | 0 | 25 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 7 | 23 | 23 | 8 | 24 | 24 | 17 | 61 | 61 | 7 | 51 | 51 |
| g / C, Green / Cycle | 0.06 | 0.20 | 0.20 | 0.07 | 0.21 | 0.21 | 0.15 | 0.53 | 0.53 | 0.06 | 0.44 | 0.44 |
| (v / s)_i Volume / Saturation Flow Rate | 0.05 | 0.09 | 0.08 | 0.05 | 0.19 | 0.09 | 0.13 | 0.39 | 0.41 | 0.05 | 0.24 | 0.26 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 216 | 388 | 388 | 242 | 402 | 402 | 266 | 2000 | 1000 | 111 | 2509 | 836 |
| d1, Uniform Delay [s] | 53.32 | 39.93 | 39.68 | 52.61 | 44.11 | 39.52 | 48.16 | 21.27 | 21.79 | 53.56 | 23.81 | 24.28 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.17 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 6.98 | 0.75 | 0.66 | 4.71 | 10.32 | 0.78 | 10.23 | 2.59 | 5.83 | 18.45 | 0.88 | 2.98 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.81 | 0.43 | 0.40 | 0.75 | 0.89 | 0.45 | 0.89 | 0.75 | 0.77 | 0.87 | 0.55 | 0.58 |
| d, Delay for Lane Group [s/veh] | 60.30 | 40.68 | 40.35 | 57.32 | 54.43 | 40.31 | 58.39 | 23.86 | 27.62 | 72.01 | 24.69 | 27.26 |
| Lane Group LOS | E | D | D | E | D | D | E | C | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.69 | 4.17 | 3.87 | 2.74 | 11.03 | 4.53 | 7.44 | 15.75 | 17.59 | 3.35 | 9.32 | 10.55 |
| 50th-Percentile Queue Length [ft/ln] | 67.28 | 104.22 | 96.63 | 68.45 | 275.76 | 113.13 | 185.91 | 393.83 | 439.87 | 83.71 | 232.96 | 263.81 |
| 95th-Percentile Queue Length [veh/ln] | 4.84 | 7.50 | 6.96 | 4.93 | 16.48 | 8.01 | 11.91 | 22.26 | 24.47 | 6.03 | 14.32 | 15.88 |
| 95th-Percentile Queue Length [ft/ln] | 121.11 | 187.60 | 173.94 | 123.21 | 411.93 | 200.34 | 297.71 | 556.56 | 611.85 | 150.67 | 358.12 | 396.99 |

**Movement, Approach, & Intersection Results**

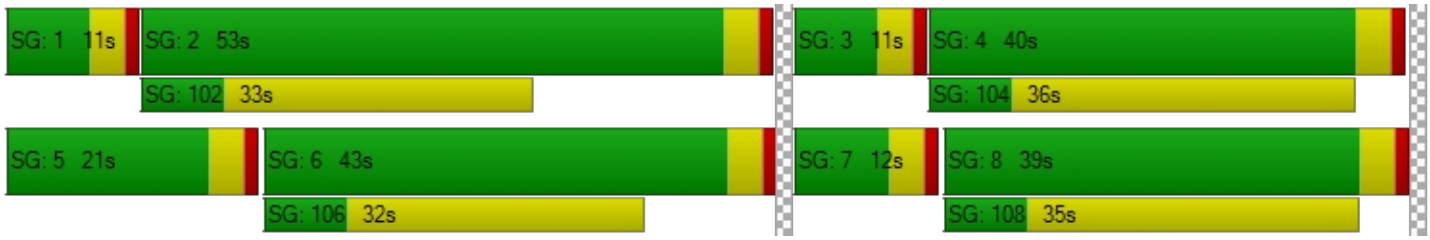
| d_M, Delay for Movement [s/veh] | 60.30 | 40.58 | 40.35 | 57.32 | 54.43 | 40.31 | 58.39 | 25.01 | 27.62 | 72.01 | 25.24 | 27.26 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | E | D | D | E | D | D | E | C | C | E | C | C |
| d_A, Approach Delay [s/veh] | 47.49 | | | 51.64 | | | 28.30 | | | 27.66 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 32.70 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.813 | | | | | | | | | | | |

**Other Modes**

| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
|---|---|---|---|---|
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 47.05 | 47.05 | 47.05 | 47.05 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.519 | 2.676 | 3.301 | 3.271 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 608 | 626 | 852 | 678 |
| d_b, Bicycle Delay [s] | 27.84 | 27.15 | 18.96 | 25.13 |
| l_b,int, Bicycle LOS Score for Intersection | 1.967 | 2.749 | 2.937 | 2.371 |
| Bicycle LOS | A | B | C | B |

## Sequence

| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 19.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.723 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 187 | 12 | 149 | 25 | 28 | 15 | 14 | 1931 | 373 | 178 | 1565 | 33 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 187 | 12 | 149 | 25 | 28 | 15 | 14 | 1931 | 373 | 178 | 1565 | 33 |
| Peak Hour Factor | 0.8320 | 0.8320 | 0.8320 | 0.6740 | 0.6740 | 0.6740 | 0.9510 | 0.9510 | 0.9510 | 0.8930 | 0.8930 | 0.8930 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 56 | 4 | 45 | 9 | 10 | 6 | 4 | 508 | 98 | 50 | 438 | 9 |
| Total Analysis Volume [veh/h] | 225 | 14 | 179 | 37 | 42 | 22 | 15 | 2030 | 392 | 199 | 1753 | 37 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 26 | 0 | 0 | 10 | 0 | 10 | 32 | 0 | 22 | 44 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 14 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 11 | 11 | 11 | 6 | 6 | 2 | 45 | 45 | 12 | 55 | 55 |
| g / C, Green / Cycle | 0.12 | 0.12 | 0.12 | 0.06 | 0.06 | 0.02 | 0.50 | 0.50 | 0.13 | 0.62 | 0.62 |
| (v / s)_i Volume / Saturation Flow Rate | 0.07 | 0.07 | 0.09 | 0.02 | 0.03 | 0.01 | 0.36 | 0.21 | 0.11 | 0.31 | 0.32 |
| s, saturation flow rate [veh/h] | 1750 | 1750 | 1900 | 1800 | 1900 | 1800 | 5700 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 217 | 217 | 235 | 112 | 119 | 40 | 2869 | 956 | 239 | 2334 | 1167 |
| d1, Uniform Delay [s] | 37.15 | 37.17 | 38.22 | 40.47 | 41.02 | 43.47 | 17.27 | 14.01 | 38.11 | 9.73 | 9.91 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 2.17 | 2.20 | 5.04 | 1.69 | 3.77 | 5.69 | 1.50 | 1.30 | 7.30 | 0.78 | 1.69 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.55 | 0.55 | 0.76 | 0.33 | 0.54 | 0.37 | 0.71 | 0.41 | 0.83 | 0.50 | 0.53 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 39.33 | 39.37 | 43.26 | 42.16 | 44.79 | 49.16 | 18.77 | 15.31 | 45.40 | 10.51 | 11.60 |
| Lane Group LOS | D | D | D | D | D | D | B | B | D | B | B |
| Critical Lane Group | No | No | Yes | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.57 | 2.58 | 4.09 | 0.83 | 1.49 | 0.39 | 10.40 | 5.04 | 4.70 | 6.00 | 6.64 |
| 50th-Percentile Queue Length [ft/ln] | 64.18 | 64.58 | 102.35 | 20.77 | 37.20 | 9.75 | 259.88 | 126.09 | 117.44 | 150.02 | 166.04 |
| 95th-Percentile Queue Length [veh/ln] | 4.62 | 4.65 | 7.37 | 1.50 | 2.68 | 0.70 | 15.68 | 8.73 | 8.25 | 10.02 | 10.87 |
| 95th-Percentile Queue Length [ft/ln] | 115.52 | 116.24 | 184.23 | 37.38 | 66.96 | 17.55 | 392.07 | 218.17 | 206.30 | 250.46 | 271.70 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 39.35 | 39.37 | 43.26 | 42.16 | 44.79 | 44.79 | 49.16 | 18.77 | 15.31 | 45.40 | 10.87 | 11.60 |
| Movement LOS | D | D | D | D | D | D | D | B | B | D | B | B |
| d_A, Approach Delay [s/veh] | 41.02 | | | 43.82 | | | 18.40 | | | 14.34 | | |
| Approach LOS | D | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 19.20 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.723 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.72 | 34.72 | 0.00 | 34.72 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.387 | 1.994 | 0.000 | 3.183 |
| Crosswalk LOS | B | A | F | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 488 | 133 | 622 | 888 |
| d_b, Bicycle Delay [s] | 25.73 | 39.24 | 21.40 | 13.92 |
| l_b,int, Bicycle LOS Score for Intersection | 2.249 | 1.726 | 2.900 | 2.654 |
| Bicycle LOS | B | A | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



Brea Mall Expansion, Brea

Vistro File: N:\...\4099 HCM Network.vistro
Report File: N:\...\PM 2026+P.pdf

Scenario 8 PM 2026+P
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | HCM 6th Edition | NB Left | 0.886 | 42.2 | D |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | HCM 6th Edition | WB Left | 0.710 | 19.8 | B |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | HCM 6th Edition | NB Left | 0.661 | 15.0 | B |
| 4 | Randolph Avenue at Birch Street | Signalized | HCM 6th Edition | NB Left | 0.547 | 32.1 | C |
| 5 | State College Boulevard at Birch Street | Signalized | HCM 6th Edition | NB Left | 0.845 | 35.9 | D |
| 6 | S Associated Road at Birch Street | Signalized | HCM 6th Edition | WB Left | 0.706 | 28.5 | C |
| 7 | Randolph Avenue at Madison Way | Signalized | HCM 6th Edition | WB Left | 0.199 | 18.5 | B |
| 8 | Randolph Avenue at Brea Mall | Signalized | HCM 6th Edition | EB Left | 0.425 | 19.4 | B |
| 9 | Brea Mall South at State College Boulevard | Signalized | HCM 6th Edition | SB Left | 0.690 | 31.2 | C |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | HCM 6th Edition | NB Left | 0.926 | 47.5 | D |
| 11 | Puente Street at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.693 | 19.2 | B |
| 12 | Brea Boulevard at Imperial Highway | Signalized | HCM 6th Edition | EB Left | 0.888 | 42.0 | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.793 | 28.4 | C |
| 14 | State College Boulevard at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 1.061 | 67.4 | E |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.773 | 17.3 | B |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | HCM 6th Edition | EB Left | 0.799 | 23.5 | C |
| 17 | Associated Road at Imperial Highway | Signalized | HCM 6th Edition | NB Left | 0.918 | 46.3 | D |
| 18 | Castlegate Lane/Placentia | Signalized | HCM 6th | EB Left | 0.837 | 26.9 | C |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | Edition | EB Left | 0.857 | 26.9 | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 42.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.886 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 326 | 617 | 323 | 587 | 415 | 16 | 40 | 1506 | 269 | 420 | 1200 | 741 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 326 | 617 | 323 | 587 | 415 | 16 | 40 | 1506 | 269 | 420 | 1200 | 741 |
| Peak Hour Factor | 0.9470 | 0.9470 | 0.9470 | 0.9220 | 0.9220 | 0.9220 | 0.8360 | 0.8360 | 0.8360 | 0.9740 | 0.9740 | 0.9740 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 86 | 163 | 85 | 159 | 113 | 4 | 12 | 450 | 80 | 108 | 308 | 190 |
| Total Analysis Volume [veh/h] | 344 | 652 | 341 | 637 | 450 | 17 | 48 | 1801 | 322 | 431 | 1232 | 761 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 17 | 33 | 0 | 28 | 44 | 0 | 10 | 38 | 0 | 21 | 49 | 49 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 28 | 0 | 0 | 22 | 22 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 13 | 25 | 25 | 25 | 24 | 36 | 36 | 5 | 38 | 38 | 17 | 50 | 78 |
| g / C, Green / Cycle | 0.11 | 0.21 | 0.21 | 0.21 | 0.20 | 0.30 | 0.30 | 0.04 | 0.32 | 0.32 | 0.14 | 0.42 | 0.65 |
| (v / s)_i Volume / Saturation Flow Rate | 0.10 | 0.18 | 0.18 | 0.16 | 0.18 | 0.12 | 0.12 | 0.01 | 0.28 | 0.28 | 0.12 | 0.22 | 0.40 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1900 | 3500 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 381 | 394 | 394 | 394 | 700 | 568 | 568 | 143 | 1826 | 609 | 486 | 2384 | 1238 |
| d1, Uniform Delay [s] | 52.87 | 46.15 | 45.98 | 44.83 | 46.96 | 33.68 | 33.62 | 56.01 | 38.50 | 38.44 | 50.78 | 25.91 | 12.15 |
| k, delay calibration | 0.11 | 0.26 | 0.25 | 0.18 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 8.04 | 13.90 | 12.25 | 5.26 | 4.98 | 0.48 | 0.47 | 1.38 | 6.12 | 15.57 | 5.68 | 0.80 | 2.29 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.90 | 0.88 | 0.87 | 0.77 | 0.91 | 0.41 | 0.41 | 0.34 | 0.87 | 0.87 | 0.89 | 0.52 | 0.61 |
| d, Delay for Lane Group [s/veh] | 60.91 | 60.05 | 58.23 | 50.09 | 51.94 | 34.16 | 34.09 | 57.38 | 44.63 | 54.01 | 56.46 | 26.72 | 14.44 |
| Lane Group LOS | E | E | E | D | D | C | C | E | D | D | E | C | B |
| Critical Lane Group | No | Yes | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 5.54 | 11.56 | 11.17 | 9.04 | 9.75 | 5.57 | 5.49 | 0.74 | 15.62 | 17.13 | 6.73 | 8.82 | 11.85 |
| 50th-Percentile Queue Length [ft/ln] | 138.6 | 289.0 | 279.3 | 226.0 | 243.66 | 139.25 | 137.25 | 18.39 | 390.40 | 428.18 | 168.32 | 220.47 | 296.19 |
| 95th-Percentile Queue Length [veh/ln] | 9.41 | 17.14 | 16.66 | 13.97 | 14.87 | 9.44 | 9.33 | 1.32 | 22.10 | 23.91 | 10.99 | 13.69 | 17.49 |
| 95th-Percentile Queue Length [ft/ln] | 235.1 | 428.4 | 416.3 | 349.2 | 371.66 | 236.01 | 233.31 | 33.11 | 552.42 | 597.86 | 274.71 | 342.23 | 437.32 |

**Movement, Approach, & Intersection Results**

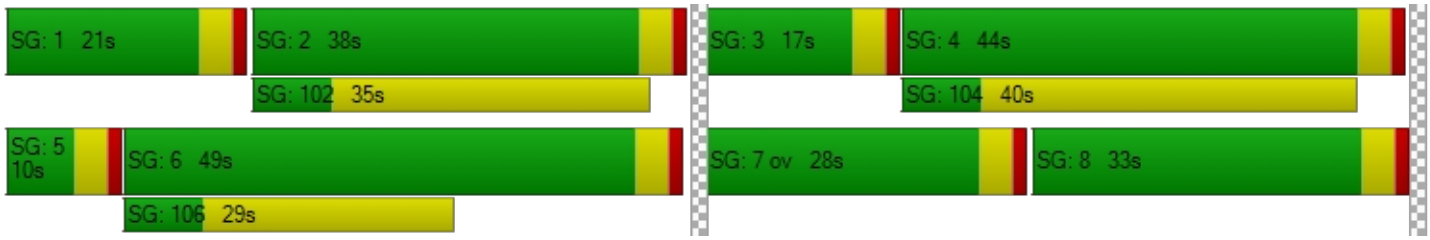
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 60.91 | 59.21 | 50.35 | 51.94 | 34.13 | 34.09 | 57.38 | 45.70 | 54.01 | 56.46 | 26.72 | 14.44 |
| Movement LOS | E | E | D | D | C | C | E | D | D | E | C | B |
| d_A, Approach Delay [s/veh] | 57.55 | | | 44.40 | | | 47.19 | | | 28.15 | | |
| Approach LOS | E | | | D | | | D | | | C | | |
| d_I, Intersection Delay [s/veh] | 42.16 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.886 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.961 | 2.883 | 3.271 | 0.000 |
| Crosswalk LOS | C | C | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 483 | 666 | 567 | 750 |
| d_b, Bicycle Delay [s] | 34.52 | 26.68 | 30.83 | 23.45 |
| l_b,int, Bicycle LOS Score for Intersection | 2.663 | 2.470 | 2.455 | 2.893 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 19.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.710 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 470 | 0 | 877 | 0 | 1481 | 857 | 257 | 1793 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 470 | 0 | 877 | 0 | 1481 | 857 | 257 | 1793 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 0.9480 | 1.0000 | 0.9480 | 1.0000 | 0.8820 | 0.8820 | 0.9530 | 0.9530 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 124 | 0 | 231 | 0 | 420 | 243 | 67 | 470 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 496 | 0 | 925 | 0 | 1679 | 972 | 270 | 1881 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 42 | 0 | 0 | 0 | 35 | 0 | 13 | 48 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 20 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | No | No | |
| Maximum Recall | | | | No | | | | No | | No | No | |
| Pedestrian Recall | | | | No | | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | R | C | R | L | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 27 | 27 | 42 | 42 | 9 | 55 |
| g / C, Green / Cycle | | 0.30 | 0.30 | 0.47 | 0.47 | 0.10 | 0.61 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.14 | 0.24 | 0.29 | 0.26 | 0.08 | 0.33 |
| s, saturation flow rate [veh/h] | | 3500 | 3800 | 5700 | 3800 | 3500 | 5700 |
| c, Capacity [veh/h] | | 1054 | 1145 | 2662 | 1775 | 345 | 3477 |
| d1, Uniform Delay [s] | | 25.61 | 29.06 | 18.13 | 17.18 | 39.65 | 10.22 |
| k, delay calibration | | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 0.33 | 1.41 | 1.15 | 1.22 | 3.93 | 0.61 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.47 | 0.81 | 0.63 | 0.55 | 0.78 | 0.54 |
| d, Delay for Lane Group [s/veh] | | 25.94 | 30.46 | 19.27 | 18.40 | 43.58 | 10.83 |
| Lane Group LOS | | C | C | B | B | D | B |
| Critical Lane Group | | No | Yes | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | | 4.26 | 9.14 | 8.56 | 7.11 | 3.07 | 6.62 |
| 50th-Percentile Queue Length [ft/ln] | | 106.62 | 228.62 | 213.95 | 177.82 | 76.64 | 165.56 |
| 95th-Percentile Queue Length [veh/ln] | | 7.65 | 14.10 | 13.36 | 11.49 | 5.52 | 10.84 |
| 95th-Percentile Queue Length [ft/ln] | | 191.28 | 352.60 | 333.89 | 287.16 | 137.94 | 271.06 |

**Movement, Approach, & Intersection Results**

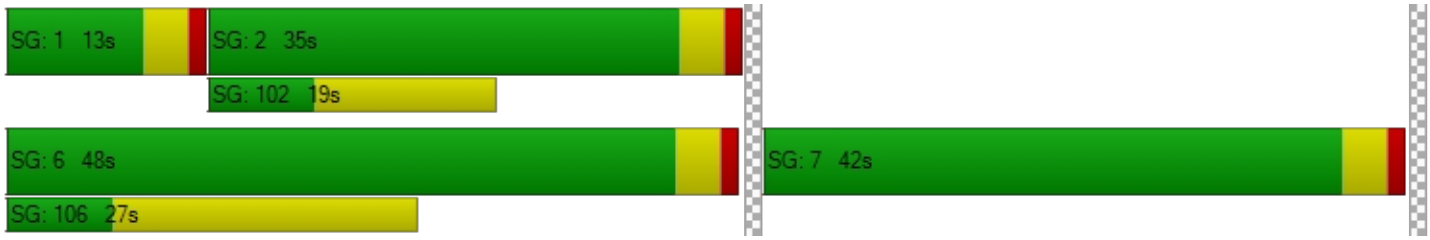
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 25.94 | 0.00 | 30.46 | 0.00 | 19.27 | 18.40 | 43.58 | 10.83 | 0.00 |
| Movement LOS | | | | C | | C | | B | B | D | B | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 28.89 | | | 18.95 | | | 14.94 | | |
| Approach LOS | A | | | C | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 19.84 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.710 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.320 | 2.477 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 844 | 689 | 978 |
| d_b, Bicycle Delay [s] | 45.01 | 15.03 | 19.35 | 11.76 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 1.560 | 3.018 | 2.743 |
| Bicycle LOS | D | A | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 15.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.661 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | | | | No | | | No | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 693 | 0 | 301 | 0 | 0 | 0 | 0 | 1573 | 588 | 0 | 1174 | 539 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 693 | 0 | 301 | 0 | 0 | 0 | 0 | 1573 | 588 | 0 | 1174 | 539 |
| Peak Hour Factor | 0.8400 | 1.0000 | 0.8400 | 1.0000 | 1.0000 | 1.0000 | 0.9710 | 0.8440 | 0.8440 | 1.0000 | 0.9530 | 0.9530 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 206 | 0 | 90 | 0 | 0 | 0 | 0 | 466 | 174 | 0 | 308 | 0 |
| Total Analysis Volume [veh/h] | 825 | 0 | 358 | 0 | 0 | 0 | 0 | 1864 | 697 | 0 | 1232 | 0 |
| Presence of On-Street Parking | No | | No | | | | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 54 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 36 | 0 |
| Vehicle Extension [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | No | | | | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | | | | | | | No | | | No | |
| Maximum Recall | No | | | | | | | No | | | No | |
| Pedestrian Recall | No | | | | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | R | | C | C | R | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 26 | 26 | | 56 | 56 | 56 | 56 |
| g / C, Green / Cycle | 0.29 | 0.29 | | 0.63 | 0.63 | 0.63 | 0.63 |
| (v / s)_i Volume / Saturation Flow Rate | 0.24 | 0.19 | | 0.34 | 0.34 | 0.34 | 0.22 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | | 3800 | 1900 | 1900 | 5700 |
| c, Capacity [veh/h] | 998 | 542 | | 2378 | 1189 | 1189 | 3567 |
| d1, Uniform Delay [s] | 30.03 | 28.28 | | 9.48 | 9.48 | 9.48 | 8.02 |
| k, delay calibration | 0.11 | 0.11 | | 0.50 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.82 | 1.39 | | 0.88 | 1.75 | 1.75 | 0.27 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.83 | 0.66 | | 0.54 | 0.54 | 0.54 | 0.35 |
| d, Delay for Lane Group [s/veh] | 31.85 | 29.67 | | 10.36 | 11.23 | 11.23 | 8.29 |
| Lane Group LOS | C | C | | B | B | B | A |
| Critical Lane Group | Yes | No | | Yes | No | No | No |
| 50th-Percentile Queue Length [veh/ln] | 8.32 | 6.81 | | 6.54 | 6.83 | 6.83 | 3.48 |
| 50th-Percentile Queue Length [ft/ln] | 208.12 | 170.16 | | 163.52 | 170.72 | 170.72 | 86.97 |
| 95th-Percentile Queue Length [veh/ln] | 13.06 | 11.09 | | 10.73 | 11.11 | 11.11 | 6.26 |
| 95th-Percentile Queue Length [ft/ln] | 326.41 | 277.13 | | 268.37 | 277.86 | 277.86 | 156.55 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 31.85 | 0.00 | 29.67 | 0.00 | 0.00 | 0.00 | 0.00 | 10.44 | 11.23 | 0.00 | 8.29 | 0.00 |
| Movement LOS | C | | C | | | | | B | B | | A | |
| d_A, Approach Delay [s/veh] | 31.19 | | | 0.00 | | | 10.80 | | | 8.29 | | |
| Approach LOS | C | | | A | | | B | | | A | | |
| d_I, Intersection Delay [s/veh] | 15.03 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.661 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 0.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.63 | 0.00 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.666 | 0.000 | 0.000 | 0.000 |
| Crosswalk LOS | B | F | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1112 | 0 | 712 | 712 |
| d_b, Bicycle Delay [s] | 8.86 | 44.96 | 18.65 | 18.65 |
| l_b,int, Bicycle LOS Score for Intersection | 1.560 | 4.132 | 2.968 | 2.237 |
| Bicycle LOS | A | D | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 32.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.547 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 141 | 59 | 175 | 52 | 51 | 110 | 80 | 730 | 112 | 198 | 1154 | 40 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 141 | 59 | 175 | 52 | 51 | 110 | 80 | 730 | 112 | 198 | 1154 | 40 |
| Peak Hour Factor | 0.8740 | 0.8740 | 0.8740 | 0.7860 | 0.7860 | 0.7860 | 0.9250 | 0.9250 | 0.9250 | 0.9540 | 0.9540 | 0.9540 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 40 | 17 | 50 | 17 | 16 | 35 | 22 | 197 | 30 | 52 | 302 | 10 |
| Total Analysis Volume [veh/h] | 161 | 68 | 200 | 66 | 65 | 140 | 86 | 789 | 121 | 208 | 1210 | 42 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 40 | 0 | 0 | 40 | 0 | 11 | 31 | 0 | 19 | 39 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 25 | 0 | 0 | 19 | 0 | 0 | 18 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 12 | 12 | 12 | 12 | 12 | 6 | 54 | 54 | 12 | 60 | 60 |
| g / C, Green / Cycle | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.06 | 0.60 | 0.60 | 0.14 | 0.67 | 0.67 |
| (v / s)_i Volume / Saturation Flow Rate | 0.09 | 0.04 | 0.11 | 0.04 | 0.11 | 0.05 | 0.25 | 0.23 | 0.12 | 0.32 | 0.02 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 106 | 257 | 257 | 234 | 257 | 114 | 1130 | 1130 | 246 | 2540 | 1270 |
| d1, Uniform Delay [s] | 35.79 | 34.95 | 37.66 | 34.98 | 37.77 | 41.51 | 9.80 | 9.66 | 37.94 | 7.27 | 5.06 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 246.74 | 0.54 | 5.08 | 0.65 | 5.65 | 9.70 | 1.11 | 1.03 | 7.69 | 0.64 | 0.05 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 1.53 | 0.26 | 0.78 | 0.28 | 0.80 | 0.76 | 0.41 | 0.39 | 0.84 | 0.48 | 0.03 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 282.53 | 35.49 | 42.74 | 35.63 | 43.42 | 51.22 | 10.91 | 10.68 | 45.62 | 7.91 | 5.11 |
| Lane Group LOS | F | D | D | D | D | D | B | B | D | A | A |
| Critical Lane Group | No | No | No | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 9.34 | 1.36 | 4.56 | 1.33 | 4.71 | 2.16 | 4.81 | 4.51 | 4.93 | 5.00 | 0.25 |
| 50th-Percentile Queue Length [ft/ln] | 233.42 | 34.05 | 113.91 | 33.20 | 117.86 | 54.12 | 120.17 | 112.85 | 123.21 | 124.92 | 6.20 |
| 95th-Percentile Queue Length [veh/ln] | 16.46 | 2.45 | 8.06 | 2.39 | 8.28 | 3.90 | 8.40 | 8.00 | 8.57 | 8.66 | 0.45 |
| 95th-Percentile Queue Length [ft/ln] | 411.62 | 61.29 | 201.42 | 59.75 | 206.88 | 97.41 | 210.06 | 199.96 | 214.22 | 216.56 | 11.16 |

**Movement, Approach, & Intersection Results**

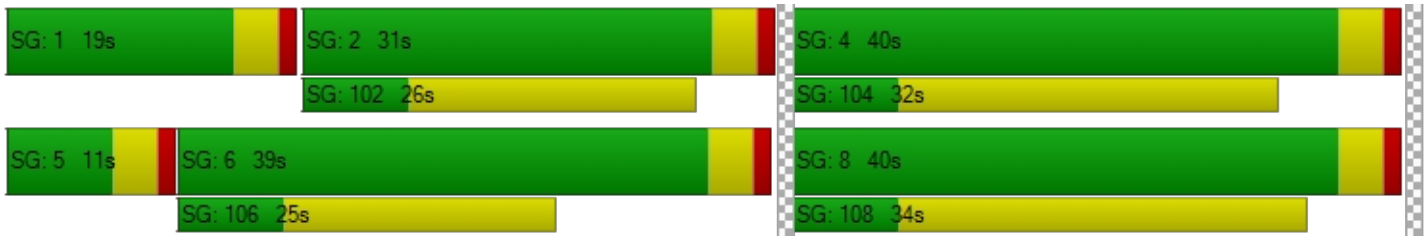
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 282.53 | 35.49 | 42.74 | 35.63 | 43.42 | 43.42 | 51.22 | 10.82 | 10.68 | 45.62 | 7.91 | 5.11 |
| Movement LOS | F | D | D | D | D | D | D | B | B | D | A | A |
| d_A, Approach Delay [s/veh] | 131.58 | | | 41.52 | | | 14.29 | | | 13.20 | | |
| Approach LOS | F | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 32.07 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.547 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.70 | 34.70 | 34.70 | 34.70 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.331 | 2.092 | 3.017 | 2.955 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 800 | 800 | 600 | 777 |
| d_b, Bicycle Delay [s] | 16.22 | 16.22 | 22.07 | 16.83 |
| l_b,int, Bicycle LOS Score for Intersection | 2.267 | 2.007 | 2.381 | 2.764 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 35.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.845 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 148 | 431 | 164 | 351 | 393 | 328 | 293 | 801 | 162 | 152 | 1025 | 673 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 148 | 431 | 164 | 351 | 393 | 328 | 293 | 801 | 162 | 152 | 1025 | 673 |
| Peak Hour Factor | 0.9210 | 0.9210 | 0.9210 | 0.9620 | 0.9620 | 0.9620 | 0.9110 | 0.9110 | 0.9110 | 0.9550 | 0.9550 | 0.9550 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 40 | 117 | 45 | 91 | 102 | 85 | 80 | 220 | 44 | 40 | 268 | 176 |
| Total Analysis Volume [veh/h] | 161 | 468 | 178 | 365 | 409 | 341 | 322 | 879 | 178 | 159 | 1073 | 705 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 110 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 10 | 39 | 0 | 18 | 47 | 0 | 16 | 42 | 0 | 11 | 37 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 19 | 19 | 13 | 27 | 27 | 12 | 55 | 55 | 7 | 49 | 49 |
| g / C, Green / Cycle | 0.05 | 0.17 | 0.17 | 0.12 | 0.24 | 0.24 | 0.11 | 0.50 | 0.50 | 0.06 | 0.45 | 0.45 |
| (v / s)_i Volume / Saturation Flow Rate | 0.05 | 0.12 | 0.09 | 0.10 | 0.21 | 0.18 | 0.09 | 0.23 | 0.09 | 0.05 | 0.28 | 0.37 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 3500 | 1900 | 1900 | 3500 | 3800 | 1900 | 3500 | 3800 | 1900 |
| c, Capacity [veh/h] | 194 | 663 | 332 | 427 | 458 | 458 | 382 | 1881 | 940 | 221 | 1706 | 853 |
| d1, Uniform Delay [s] | 51.49 | 42.78 | 41.38 | 47.38 | 40.26 | 38.74 | 48.11 | 18.27 | 15.50 | 50.62 | 23.30 | 26.59 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.13 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 8.85 | 1.39 | 1.35 | 4.97 | 6.60 | 2.54 | 5.07 | 0.84 | 0.45 | 4.36 | 1.77 | 9.02 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.83 | 0.71 | 0.54 | 0.85 | 0.88 | 0.75 | 0.84 | 0.47 | 0.19 | 0.72 | 0.63 | 0.83 |
| d, Delay for Lane Group [s/veh] | 60.34 | 44.17 | 42.73 | 52.35 | 46.86 | 41.28 | 53.18 | 19.11 | 15.94 | 54.97 | 25.07 | 35.61 |
| Lane Group LOS | E | D | D | D | D | D | D | B | B | D | C | D |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | 2.43 | 6.09 | 4.52 | 5.18 | 11.28 | 8.90 | 4.59 | 7.38 | 2.58 | 2.28 | 10.84 | 17.76 |
| 50th-Percentile Queue Length [ft/ln] | 60.81 | 152.37 | 112.89 | 129.44 | 282.00 | 222.62 | 114.70 | 184.52 | 64.42 | 56.99 | 270.97 | 443.99 |
| 95th-Percentile Queue Length [veh/ln] | 4.38 | 10.14 | 8.00 | 8.91 | 16.79 | 13.80 | 8.10 | 11.84 | 4.64 | 4.10 | 16.24 | 24.67 |
| 95th-Percentile Queue Length [ft/ln] | 109.46 | 253.59 | 200.01 | 222.74 | 419.70 | 344.97 | 202.52 | 295.90 | 115.95 | 102.59 | 405.95 | 616.77 |

**Movement, Approach, & Intersection Results**

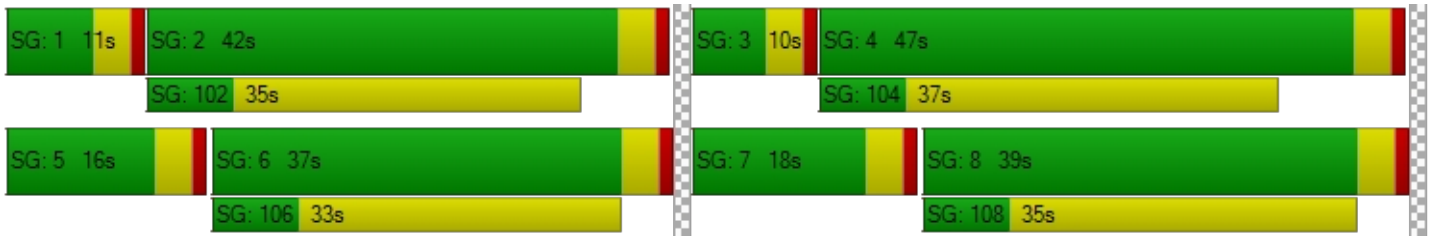
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 60.34 | 44.17 | 42.73 | 52.35 | 46.80 | 41.28 | 53.18 | 19.11 | 15.94 | 54.97 | 25.07 | 35.61 |
| Movement LOS | E | D | D | D | D | D | D | B | B | D | C | D |
| d_A, Approach Delay [s/veh] | 47.08 | | | 46.93 | | | 26.66 | | | 31.36 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 35.86 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.845 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 44.58 | 44.58 | 44.58 | 44.58 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.820 | 2.887 | 3.015 | 3.071 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 636 | 781 | 691 | 600 |
| d_b, Bicycle Delay [s] | 25.59 | 20.43 | 23.59 | 26.97 |
| l_b,int, Bicycle LOS Score for Intersection | 2.225 | 2.479 | 2.697 | 3.158 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 28.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.706 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 500 | 33 | 355 | 11 | 20 | 9 | 16 | 934 | 314 | 295 | 1324 | 18 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 500 | 33 | 355 | 11 | 20 | 9 | 16 | 934 | 314 | 295 | 1324 | 18 |
| Peak Hour Factor | 0.9370 | 0.9370 | 0.9370 | 0.8500 | 0.8500 | 0.8500 | 0.9910 | 0.9910 | 0.9910 | 0.9420 | 0.9420 | 0.9420 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 133 | 9 | 95 | 3 | 6 | 3 | 4 | 236 | 79 | 78 | 351 | 5 |
| Total Analysis Volume [veh/h] | 534 | 35 | 379 | 13 | 24 | 11 | 16 | 942 | 317 | 313 | 1406 | 19 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 6 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 30 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 28 | 65 | 65 | 0 | 37 | 0 | 10 | 40 | 0 | 15 | 45 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 7 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 26 | 0 | 26 | 0 | 0 | 27 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | No | | No | | No | No | | No | No | |
| Maximum Recall | No | No | No | | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | No | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 21 | 29 | 44 | 5 | 5 | 3 | 68 | 68 | 11 | 76 | 76 |
| g / C, Green / Cycle | 0.17 | 0.25 | 0.37 | 0.04 | 0.04 | 0.02 | 0.56 | 0.56 | 0.09 | 0.63 | 0.63 |
| (v / s)_i Volume / Saturation Flow Rate | 0.15 | 0.02 | 0.20 | 0.01 | 0.02 | 0.01 | 0.34 | 0.32 | 0.09 | 0.38 | 0.37 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 |
| c, Capacity [veh/h] | 602 | 467 | 705 | 80 | 77 | 38 | 1069 | 1069 | 322 | 1203 | 1203 |
| d1, Uniform Delay [s] | 48.55 | 34.79 | 29.67 | 55.67 | 56.31 | 58.02 | 17.53 | 16.85 | 54.35 | 12.92 | 12.91 |
| k, delay calibration | 0.11 | 0.11 | 0.30 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.65 | 0.07 | 1.78 | 0.93 | 4.19 | 7.21 | 2.63 | 2.17 | 17.64 | 2.15 | 2.14 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.89 | 0.07 | 0.54 | 0.16 | 0.46 | 0.42 | 0.61 | 0.57 | 0.97 | 0.59 | 0.59 |
| d, Delay for Lane Group [s/veh] | 53.20 | 34.86 | 31.45 | 56.61 | 60.50 | 65.23 | 20.16 | 19.02 | 71.98 | 15.08 | 15.05 |
| Lane Group LOS | D | C | C | E | E | E | C | B | E | B | B |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 8.18 | 0.80 | 8.92 | 0.40 | 1.13 | 0.56 | 12.46 | 11.00 | 5.50 | 11.37 | 11.33 |
| 50th-Percentile Queue Length [ft/ln] | 204.45 | 20.07 | 222.98 | 10.05 | 28.19 | 13.92 | 311.45 | 275.00 | 137.41 | 284.15 | 283.30 |
| 95th-Percentile Queue Length [veh/ln] | 12.87 | 1.45 | 13.82 | 0.72 | 2.03 | 1.00 | 18.25 | 16.44 | 9.34 | 16.89 | 16.85 |
| 95th-Percentile Queue Length [ft/ln] | 321.70 | 36.13 | 345.43 | 18.09 | 50.74 | 25.05 | 456.16 | 410.98 | 233.53 | 422.37 | 421.32 |

**Movement, Approach, & Intersection Results**

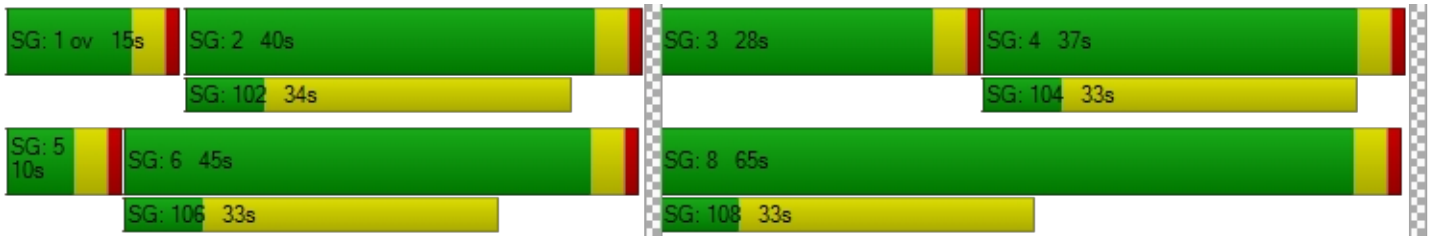
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 53.20 | 34.86 | 31.45 | 56.61 | 60.50 | 60.50 | 65.23 | 19.81 | 19.02 | 71.98 | 15.07 | 15.05 |
| Movement LOS | D | C | C | E | E | E | E | B | B | E | B | B |
| d_A, Approach Delay [s/veh] | 43.83 | | | 59.45 | | | 20.18 | | | 25.32 | | |
| Approach LOS | D | | | E | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 28.47 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.706 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.51 | 49.51 | 49.51 | 49.51 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.727 | 1.992 | 2.943 | 2.984 |
| Crosswalk LOS | B | A | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1017 | 550 | 600 | 683 |
| d_b, Bicycle Delay [s] | 14.51 | 31.54 | 29.41 | 26.01 |
| l_b,int, Bicycle LOS Score for Intersection | 3.124 | 1.639 | 2.611 | 2.993 |
| Bicycle LOS | C | A | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 18.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.199 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 48 | 332 | 43 | 28 | 277 | 30 | 65 | 4 | 52 | 75 | 4 | 38 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 48 | 332 | 43 | 28 | 277 | 30 | 65 | 4 | 52 | 75 | 4 | 38 |
| Peak Hour Factor | 0.9560 | 0.9560 | 0.9560 | 0.9590 | 0.9590 | 0.9590 | 0.6990 | 0.6990 | 0.6990 | 0.8710 | 0.8710 | 0.8710 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 13 | 87 | 11 | 7 | 72 | 8 | 23 | 1 | 19 | 22 | 1 | 11 |
| Total Analysis Volume [veh/h] | 50 | 347 | 45 | 29 | 289 | 31 | 93 | 6 | 74 | 86 | 5 | 44 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 11 | 26 | 0 | 10 | 25 | 0 | 0 | 54 | 0 | 0 | 54 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 12 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | L | C | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 4 | 68 | 68 | 3 | 67 | 67 | 7 | 7 | 7 | 7 |
| g / C, Green / Cycle | 0.05 | 0.76 | 0.76 | 0.04 | 0.74 | 0.74 | 0.08 | 0.08 | 0.08 | 0.08 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.10 | 0.10 | 0.02 | 0.09 | 0.08 | 0.05 | 0.04 | 0.05 | 0.03 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 88 | 1435 | 1435 | 64 | 1410 | 1410 | 139 | 145 | 111 | 145 |
| d1, Uniform Delay [s] | 41.91 | 3.02 | 3.01 | 42.56 | 3.28 | 3.27 | 40.53 | 40.12 | 40.36 | 39.45 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.70 | 0.20 | 0.20 | 4.91 | 0.17 | 0.16 | 5.42 | 3.28 | 11.02 | 1.37 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.57 | 0.14 | 0.13 | 0.45 | 0.11 | 0.11 | 0.67 | 0.55 | 0.78 | 0.34 |
|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 47.61 | 3.22 | 3.20 | 47.47 | 3.44 | 3.43 | 45.94 | 43.40 | 51.38 | 40.82 |
| Lane Group LOS | D | A | A | D | A | A | D | D | D | D |
| Critical Lane Group | No | Yes | No | Yes | No | No | Yes | No | No | No |
| 50th-Percentile Queue Length [veh/ln] | 1.21 | 0.79 | 0.77 | 0.71 | 0.69 | 0.68 | 2.19 | 1.82 | 2.17 | 1.07 |
| 50th-Percentile Queue Length [ft/ln] | 30.37 | 19.86 | 19.24 | 17.84 | 17.28 | 16.90 | 54.84 | 45.53 | 54.15 | 26.82 |
| 95th-Percentile Queue Length [veh/ln] | 2.19 | 1.43 | 1.39 | 1.28 | 1.24 | 1.22 | 3.95 | 3.28 | 3.90 | 1.93 |
| 95th-Percentile Queue Length [ft/ln] | 54.67 | 35.76 | 34.63 | 32.12 | 31.10 | 30.42 | 98.71 | 81.96 | 97.47 | 48.27 |

**Movement, Approach, & Intersection Results**

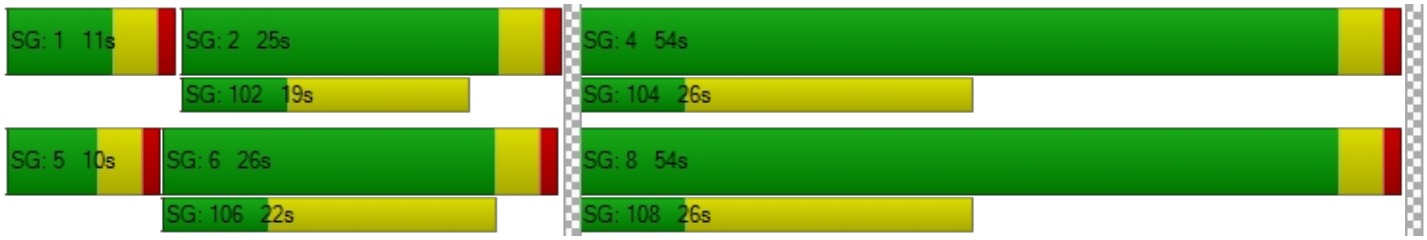
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 47.61 | 3.21 | 3.20 | 47.47 | 3.44 | 3.43 | 45.94 | 43.40 | 43.40 | 51.38 | 40.82 | 40.82 |
| Movement LOS | D | A | A | D | A | A | D | D | D | D | D | D |
| d_A, Approach Delay [s/veh] | 8.23 | | | 7.10 | | | 44.77 | | | 47.55 | | |
| Approach LOS | A | | | A | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 18.45 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.199 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.595 | 2.594 | 2.024 | 2.010 |
| Crosswalk LOS | B | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 489 | 467 | 1111 | 1111 |
| d_b, Bicycle Delay [s] | 25.70 | 26.46 | 8.90 | 8.90 |
| l_b,int, Bicycle LOS Score for Intersection | 1.924 | 1.848 | 1.845 | 1.782 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 19.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.425 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 17 | 338 | 414 | 54 | 373 | 20 | 18 | 3 | 12 | 314 | 3 | 56 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 17 | 338 | 414 | 54 | 373 | 20 | 18 | 3 | 12 | 314 | 3 | 56 |
| Peak Hour Factor | 0.9560 | 0.9560 | 0.9560 | 0.9310 | 0.9310 | 0.9310 | 0.9380 | 0.9380 | 0.9380 | 0.8620 | 0.8620 | 0.8620 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 88 | 108 | 15 | 100 | 5 | 5 | 1 | 3 | 91 | 1 | 16 |
| Total Analysis Volume [veh/h] | 18 | 354 | 433 | 58 | 401 | 21 | 19 | 3 | 13 | 364 | 3 | 65 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 29 | 0 | 10 | 29 | 0 | 0 | 30 | 0 | 0 | 31 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 17 | 0 | 0 | 18 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | C | R | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 0.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 69 | 61 | 61 | 69 | 63 | 63 | 4 | 4 | 15 | 15 |
| g / C, Green / Cycle | 0.69 | 0.61 | 0.61 | 0.69 | 0.63 | 0.63 | 0.04 | 0.04 | 0.15 | 0.15 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.19 | 0.23 | 0.03 | 0.11 | 0.11 | 0.01 | 0.01 | 0.12 | 0.11 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 1264 | 1151 | 1151 | 1135 | 1197 | 1197 | 68 | 72 | 266 | 281 |
| d1, Uniform Delay [s] | 4.73 | 9.57 | 10.08 | 4.84 | 7.71 | 7.70 | 46.89 | 46.63 | 41.37 | 40.88 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.00 | 0.69 | 0.94 | 0.09 | 0.32 | 0.32 | 2.69 | 1.19 | 6.36 | 4.10 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.01 | 0.31 | 0.38 | 0.05 | 0.18 | 0.18 | 0.32 | 0.18 | 0.82 | 0.75 |
|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 4.73 | 10.26 | 11.02 | 4.92 | 8.04 | 8.02 | 49.57 | 47.82 | 47.73 | 44.98 |
| Lane Group LOS | A | B | B | A | A | A | D | D | D | D |
| Critical Lane Group | No | No | Yes | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.10 | 3.73 | 4.82 | 0.36 | 1.87 | 1.84 | 0.58 | 0.34 | 5.68 | 5.29 |
| 50th-Percentile Queue Length [ft/ln] | 2.59 | 93.15 | 120.45 | 9.07 | 46.79 | 46.11 | 14.56 | 8.40 | 141.94 | 132.20 |
| 95th-Percentile Queue Length [veh/ln] | 0.19 | 6.71 | 8.42 | 0.65 | 3.37 | 3.32 | 1.05 | 0.60 | 9.59 | 9.06 |
| 95th-Percentile Queue Length [ft/ln] | 4.65 | 167.67 | 210.44 | 16.32 | 84.23 | 82.99 | 26.20 | 15.12 | 239.64 | 226.48 |

**Movement, Approach, & Intersection Results**

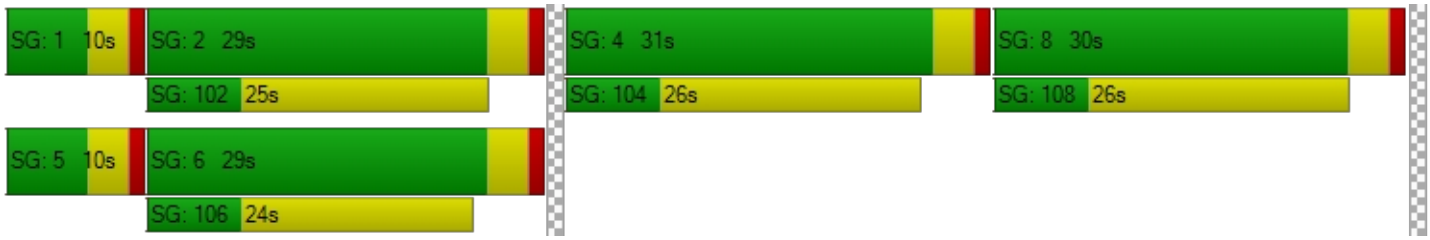
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 4.73 | 10.26 | 11.02 | 4.92 | 8.03 | 8.02 | 49.57 | 49.57 | 47.82 | 46.64 | 44.98 | 44.98 |
| Movement LOS | A | B | B | A | A | A | D | D | D | D | D | D |
| d_A, Approach Delay [s/veh] | 10.55 | | | 7.65 | | | 48.92 | | | 46.38 | | |
| Approach LOS | B | | | A | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 19.36 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.425 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 39.62 | 39.62 | 39.62 | 39.62 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.613 | 2.484 | 1.987 | 2.298 |
| Crosswalk LOS | B | B | A | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 500 | 500 | 520 | 540 |
| d_b, Bicycle Delay [s] | 28.14 | 28.14 | 27.40 | 26.66 |
| l_b,int, Bicycle LOS Score for Intersection | 2.224 | 1.956 | 1.617 | 2.272 |
| Bicycle LOS | B | A | A | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 31.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.690 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 144 | 25 | 67 | 56 | 19 | 409 | 595 | 567 | 23 | 99 | 467 | 48 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 144 | 25 | 67 | 56 | 19 | 409 | 595 | 567 | 23 | 99 | 467 | 48 |
| Peak Hour Factor | 0.8330 | 0.8330 | 0.8330 | 0.9000 | 0.9000 | 0.9000 | 0.8700 | 0.8700 | 0.8700 | 0.9090 | 0.9090 | 0.9090 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 43 | 8 | 20 | 16 | 5 | 114 | 171 | 163 | 7 | 27 | 128 | 13 |
| Total Analysis Volume [veh/h] | 173 | 30 | 80 | 62 | 21 | 454 | 684 | 652 | 26 | 109 | 514 | 53 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 6 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 30 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 37 | 0 | 0 | 10 | 10 | 41 | 36 | 0 | 37 | 32 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 21 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | No | No | No | | No | No | |
| Maximum Recall | | No | | | No | No | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | No | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | C | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 11 | 11 | 11 | 6 | 6 | 53 | 28 | 78 | 78 | 9 | 60 | 60 |
| g / C, Green / Cycle | 0.09 | 0.09 | 0.09 | 0.05 | 0.05 | 0.44 | 0.23 | 0.65 | 0.65 | 0.08 | 0.50 | 0.50 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.07 | 0.04 | 0.03 | 0.01 | 0.24 | 0.20 | 0.18 | 0.18 | 0.06 | 0.15 | 0.15 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 1900 | 1900 |
| c, Capacity [veh/h] | 197 | 215 | 171 | 93 | 98 | 833 | 807 | 1232 | 1232 | 139 | 940 | 940 |
| d1, Uniform Delay [s] | 51.90 | 53.54 | 51.92 | 55.96 | 54.64 | 24.87 | 44.21 | 9.06 | 9.04 | 54.46 | 18.06 | 17.97 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.42 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.21 | 2.62 | 1.98 | 8.03 | 1.08 | 2.15 | 2.59 | 0.56 | 0.55 | 9.38 | 0.84 | 0.81 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.38 | 0.59 | 0.47 | 0.67 | 0.21 | 0.54 | 0.85 | 0.28 | 0.27 | 0.79 | 0.31 | 0.30 |
| d, Delay for Lane Group [s/veh] | 53.11 | 56.15 | 53.90 | 64.00 | 55.72 | 27.02 | 46.80 | 9.62 | 9.59 | 63.84 | 18.91 | 18.78 |
| Lane Group LOS | D | E | D | E | E | C | D | A | A | E | B | B |
| Critical Lane Group | No | Yes | No | No | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 2.22 | 3.93 | 2.39 | 2.05 | 0.64 | 9.96 | 9.98 | 3.85 | 3.80 | 3.60 | 4.95 | 4.77 |
| 50th-Percentile Queue Length [ft/ln] | 55.52 | 98.35 | 59.68 | 51.36 | 16.01 | 249.04 | 249.44 | 96.30 | 94.97 | 90.01 | 123.66 | 119.34 |
| 95th-Percentile Queue Length [veh/ln] | 4.00 | 7.08 | 4.30 | 3.70 | 1.15 | 15.14 | 15.16 | 6.93 | 6.84 | 6.48 | 8.59 | 8.36 |
| 95th-Percentile Queue Length [ft/ln] | 99.94 | 177.03 | 107.43 | 92.45 | 28.82 | 378.44 | 378.94 | 173.34 | 170.95 | 162.01 | 214.84 | 208.92 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 54.77 | 56.15 | 53.90 | 64.00 | 55.72 | 27.02 | 46.80 | 9.60 | 9.59 | 63.84 | 18.85 | 18.78 |
| Movement LOS | D | E | D | E | E | C | D | A | A | E | B | B |
| d_A, Approach Delay [s/veh] | 54.71 | | | 32.41 | | | 28.28 | | | 26.10 | | |
| Approach LOS | D | | | C | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 31.16 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.690 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 0.00 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.399 | 2.568 | 0.000 | 2.600 |
| Crosswalk LOS | B | B | F | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 550 | 100 | 533 | 466 |
| d_b, Bicycle Delay [s] | 31.57 | 54.18 | 32.30 | 35.30 |
| l_b,int, Bicycle LOS Score for Intersection | 2.027 | 2.003 | 2.683 | 2.117 |
| Bicycle LOS | B | B | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 47.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.926 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 443 | 1174 | 232 | 280 | 976 | 418 | 320 | 1309 | 298 | 450 | 1613 | 287 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 443 | 1174 | 232 | 280 | 976 | 418 | 320 | 1309 | 298 | 450 | 1613 | 287 |
| Peak Hour Factor | 0.9550 | 0.9550 | 0.9550 | 0.9460 | 0.9460 | 0.9460 | 0.9460 | 0.9460 | 0.9460 | 0.9450 | 0.9450 | 0.9450 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 116 | 307 | 61 | 74 | 258 | 110 | 85 | 346 | 79 | 119 | 427 | 76 |
| Total Analysis Volume [veh/h] | 464 | 1229 | 243 | 296 | 1032 | 442 | 338 | 1384 | 315 | 476 | 1707 | 304 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 19 | 42 | 0 | 16 | 39 | 0 | 17 | 42 | 0 | 20 | 45 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 31 | 0 | 0 | 28 | 0 | 0 | 31 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 15 | 35 | 35 | 12 | 32 | 32 | 13 | 41 | 41 | 16 | 44 | 44 |
| g / C, Green / Cycle | 0.13 | 0.29 | 0.29 | 0.10 | 0.26 | 0.26 | 0.11 | 0.34 | 0.34 | 0.13 | 0.37 | 0.37 |
| (v / s)_i Volume / Saturation Flow Rate | 0.13 | 0.22 | 0.13 | 0.08 | 0.18 | 0.23 | 0.10 | 0.30 | 0.29 | 0.14 | 0.30 | 0.16 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 440 | 1638 | 546 | 353 | 1496 | 499 | 383 | 1309 | 654 | 469 | 2105 | 702 |
| d1, Uniform Delay [s] | 52.50 | 38.88 | 34.97 | 53.04 | 39.90 | 42.58 | 52.74 | 36.94 | 36.45 | 52.01 | 34.11 | 28.45 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.31 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 35.76 | 0.71 | 0.57 | 5.33 | 0.58 | 13.84 | 6.81 | 8.35 | 12.84 | 22.88 | 3.53 | 1.95 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 1.05 | 0.75 | 0.44 | 0.84 | 0.69 | 0.89 | 0.88 | 0.87 | 0.85 | 1.01 | 0.81 | 0.43 |
| d, Delay for Lane Group [s/veh] | 88.26 | 39.59 | 35.54 | 58.38 | 40.48 | 56.42 | 59.55 | 45.29 | 49.28 | 74.89 | 37.64 | 30.40 |
| Lane Group LOS | F | D | D | E | D | E | E | D | D | F | D | C |
| Critical Lane Group | Yes | No | No | No | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 8.81 | 11.00 | 5.90 | 4.65 | 9.19 | 14.41 | 5.38 | 17.07 | 17.19 | 8.54 | 15.43 | 6.95 |
| 50th-Percentile Queue Length [ft/ln] | 220.23 | 274.93 | 147.40 | 116.15 | 229.73 | 360.20 | 134.56 | 426.66 | 429.75 | 213.51 | 385.79 | 173.72 |
| 95th-Percentile Queue Length [veh/ln] | 13.98 | 16.44 | 9.88 | 8.18 | 14.16 | 20.63 | 9.19 | 23.84 | 23.99 | 13.42 | 21.87 | 11.27 |
| 95th-Percentile Queue Length [ft/ln] | 349.52 | 410.89 | 246.96 | 204.52 | 354.02 | 515.83 | 229.68 | 596.04 | 599.74 | 335.40 | 546.85 | 281.80 |

**Movement, Approach, & Intersection Results**

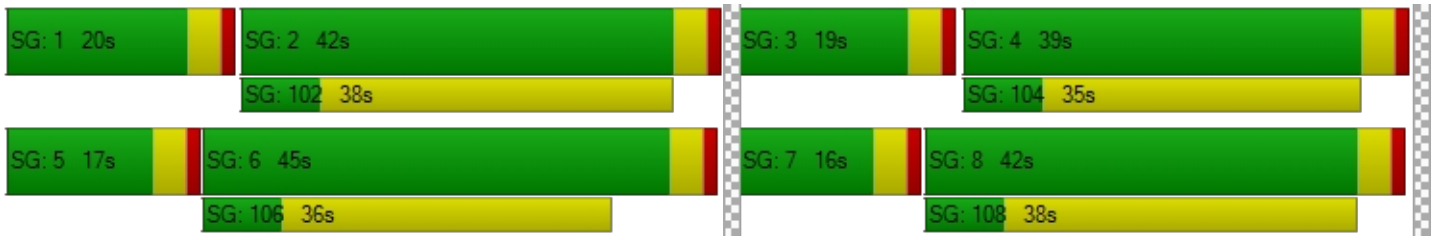
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 88.26 | 39.59 | 35.54 | 58.38 | 40.48 | 56.42 | 59.55 | 45.98 | 49.28 | 74.89 | 37.64 | 30.40 |
| Movement LOS | F | D | D | E | D | E | E | D | D | F | D | C |
| d_A, Approach Delay [s/veh] | 50.75 | | | 47.45 | | | 48.74 | | | 43.89 | | |
| Approach LOS | D | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 47.47 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.926 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.270 | 3.257 | 3.306 | 3.341 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 633 | 583 | 633 | 683 |
| d_b, Bicycle Delay [s] | 28.04 | 30.13 | 28.04 | 26.03 |
| l_b,int, Bicycle LOS Score for Intersection | 2.624 | 2.533 | 2.680 | 2.927 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 19.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.693 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 36 | 49 | 88 | 196 | 108 | 217 | 139 | 1640 | 38 | 109 | 1833 | 281 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 36 | 49 | 88 | 196 | 108 | 217 | 139 | 1640 | 38 | 109 | 1833 | 281 |
| Peak Hour Factor | 0.7970 | 0.7970 | 0.7970 | 0.6700 | 0.6700 | 0.6700 | 0.9700 | 0.9700 | 0.9700 | 0.9160 | 0.9160 | 0.9160 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 11 | 15 | 28 | 73 | 40 | 81 | 36 | 423 | 10 | 30 | 500 | 77 |
| Total Analysis Volume [veh/h] | 45 | 61 | 110 | 293 | 161 | 324 | 143 | 1691 | 39 | 119 | 2001 | 307 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 43 | 0 | 0 | 43 | 0 | 13 | 35 | 0 | 12 | 34 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 23 | 0 | 0 | 17 | 0 | 0 | 23 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 18 | 18 | 18 | 18 | 18 | 18 | 9 | 52 | 52 | 8 | 51 | 51 |
| g / C, Green / Cycle | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.10 | 0.58 | 0.58 | 0.08 | 0.56 | 0.56 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.03 | 0.06 | 0.16 | 0.04 | 0.17 | 0.08 | 0.30 | 0.31 | 0.07 | 0.35 | 0.16 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 351 | 390 | 390 | 367 | 779 | 390 | 178 | 2194 | 1097 | 152 | 3209 | 1070 |
| d1, Uniform Delay [s] | 29.20 | 29.41 | 30.22 | 34.00 | 29.73 | 34.32 | 39.74 | 11.49 | 11.68 | 40.44 | 13.26 | 10.26 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.16 | 0.19 | 0.39 | 4.02 | 0.13 | 4.65 | 8.22 | 0.88 | 1.90 | 8.53 | 0.92 | 0.68 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.13 | 0.16 | 0.28 | 0.80 | 0.21 | 0.83 | 0.80 | 0.52 | 0.54 | 0.78 | 0.62 | 0.29 |
| d, Delay for Lane Group [s/veh] | 29.36 | 29.60 | 30.61 | 38.03 | 29.86 | 38.97 | 47.96 | 12.37 | 13.59 | 48.97 | 14.18 | 10.94 |
| Lane Group LOS | C | C | C | D | C | D | D | B | B | D | B | B |
| Critical Lane Group | No | No | No | No | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.80 | 1.09 | 2.03 | 6.36 | 1.44 | 7.15 | 3.46 | 6.49 | 7.16 | 2.91 | 8.52 | 3.14 |
| 50th-Percentile Queue Length [ft/ln] | 20.02 | 27.30 | 50.71 | 159.07 | 36.10 | 178.67 | 86.56 | 162.31 | 178.98 | 72.83 | 212.97 | 78.45 |
| 95th-Percentile Queue Length [veh/ln] | 1.44 | 1.97 | 3.65 | 10.50 | 2.60 | 11.53 | 6.23 | 10.67 | 11.55 | 5.24 | 13.31 | 5.65 |
| 95th-Percentile Queue Length [ft/ln] | 36.04 | 49.14 | 91.28 | 262.49 | 64.97 | 288.28 | 155.81 | 266.78 | 288.68 | 131.09 | 332.64 | 141.21 |

**Movement, Approach, & Intersection Results**

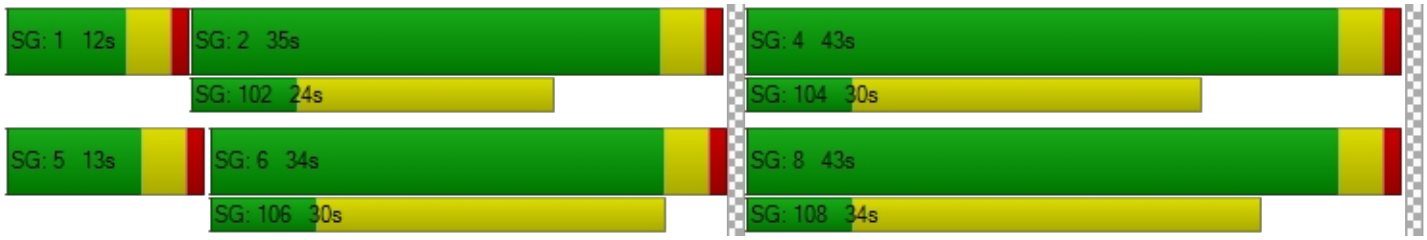
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 29.36 | 29.60 | 30.61 | 38.03 | 29.86 | 38.97 | 47.96 | 12.77 | 13.59 | 48.97 | 14.18 | 10.94 |
| Movement LOS | C | C | C | D | C | D | D | B | B | D | B | B |
| d_A, Approach Delay [s/veh] | 30.06 | | | 36.73 | | | 15.47 | | | 15.48 | | |
| Approach LOS | C | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 19.19 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.693 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.70 | 34.70 | 34.70 | 34.70 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.404 | 2.551 | 3.248 | 3.693 |
| Crosswalk LOS | B | B | C | D |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 866 | 866 | 689 | 666 |
| d_b, Bicycle Delay [s] | 14.47 | 14.47 | 19.36 | 20.02 |
| l_b,int, Bicycle LOS Score for Intersection | 1.916 | 2.201 | 2.590 | 2.894 |
| Bicycle LOS | A | B | B | C |

## Sequence

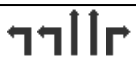
| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 42.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.888 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 536 | 890 | 297 | 264 | 696 | 217 | 242 | 1874 | 433 | 260 | 1862 | 197 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 536 | 890 | 297 | 264 | 696 | 217 | 242 | 1874 | 433 | 260 | 1862 | 197 |
| Peak Hour Factor | 0.9630 | 0.9630 | 0.9630 | 0.9380 | 0.9380 | 0.9380 | 0.9710 | 0.9710 | 0.9710 | 0.9670 | 0.9670 | 0.9670 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 139 | 231 | 77 | 70 | 186 | 58 | 62 | 482 | 111 | 67 | 481 | 51 |
| Total Analysis Volume [veh/h] | 557 | 924 | 308 | 281 | 742 | 231 | 249 | 1930 | 446 | 269 | 1926 | 204 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 23 | 46 | 0 | 16 | 39 | 0 | 13 | 44 | 0 | 14 | 45 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 19 | 34 | 34 | 12 | 27 | 27 | 9 | 48 | 48 | 10 | 49 | 49 |
| g / C, Green / Cycle | 0.16 | 0.29 | 0.29 | 0.10 | 0.22 | 0.22 | 0.08 | 0.40 | 0.40 | 0.08 | 0.41 | 0.41 |
| (v / s)_i Volume / Saturation Flow Rate | 0.16 | 0.16 | 0.16 | 0.08 | 0.20 | 0.12 | 0.07 | 0.34 | 0.23 | 0.08 | 0.34 | 0.11 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 556 | 1626 | 542 | 340 | 849 | 424 | 267 | 2280 | 760 | 296 | 2327 | 776 |
| d1, Uniform Delay [s] | 50.52 | 36.62 | 36.62 | 53.25 | 45.02 | 41.24 | 55.17 | 32.69 | 28.26 | 54.53 | 31.77 | 23.56 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 18.12 | 0.31 | 0.94 | 5.15 | 3.02 | 1.09 | 13.83 | 4.11 | 3.31 | 10.46 | 3.55 | 0.83 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 1.00 | 0.57 | 0.57 | 0.83 | 0.87 | 0.54 | 0.93 | 0.85 | 0.59 | 0.91 | 0.83 | 0.26 |
| d, Delay for Lane Group [s/veh] | 68.64 | 36.93 | 37.56 | 58.40 | 48.03 | 42.33 | 69.01 | 36.80 | 31.56 | 64.99 | 35.32 | 24.39 |
| Lane Group LOS | F | D | D | E | D | D | E | D | C | E | D | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 9.72 | 7.75 | 7.84 | 4.41 | 10.97 | 6.18 | 4.26 | 17.50 | 10.66 | 4.46 | 17.07 | 4.02 |
| 50th-Percentile Queue Length [ft/ln] | 243.06 | 193.70 | 196.06 | 110.14 | 274.23 | 154.55 | 106.46 | 437.39 | 266.52 | 111.52 | 426.83 | 100.54 |
| 95th-Percentile Queue Length [veh/ln] | 14.85 | 12.31 | 12.44 | 7.85 | 16.40 | 10.26 | 7.64 | 24.36 | 16.02 | 7.92 | 23.85 | 7.24 |
| 95th-Percentile Queue Length [ft/ln] | 371.20 | 307.83 | 310.88 | 196.19 | 410.02 | 256.50 | 191.07 | 608.88 | 400.39 | 198.12 | 596.24 | 180.97 |

**Movement, Approach, & Intersection Results**

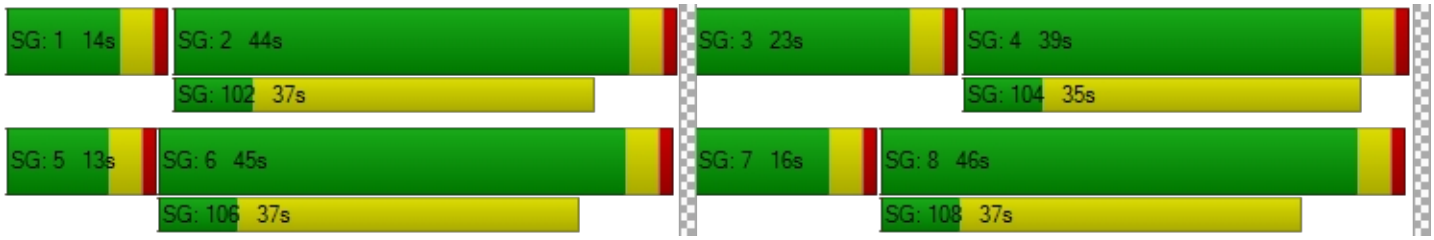
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 68.64 | 36.93 | 37.56 | 58.40 | 48.03 | 42.33 | 69.01 | 36.80 | 31.56 | 64.99 | 35.32 | 24.39 |
| Movement LOS | F | D | D | E | D | D | E | D | C | E | D | C |
| d_A, Approach Delay [s/veh] | 46.92 | | | 49.31 | | | 38.97 | | | 37.72 | | |
| Approach LOS | D | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 41.96 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.888 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.135 | 3.060 | 3.441 | 3.396 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 700 | 583 | 666 | 683 |
| d_b, Bicycle Delay [s] | 25.38 | 30.13 | 26.69 | 26.03 |
| l_b,int, Bicycle LOS Score for Intersection | 2.544 | 2.594 | 3.003 | 2.879 |
| Bicycle LOS | B | B | C | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 28.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.793 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 58 | 39 | 69 | 352 | 30 | 239 | 320 | 1807 | 45 | 73 | 2051 | 368 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 58 | 39 | 69 | 352 | 30 | 239 | 320 | 1807 | 45 | 73 | 2051 | 368 |
| Peak Hour Factor | 0.8890 | 0.8890 | 0.8890 | 0.8820 | 0.8820 | 0.8820 | 0.9540 | 0.9540 | 0.9540 | 0.9450 | 0.9450 | 0.9450 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 16 | 11 | 19 | 100 | 9 | 68 | 84 | 474 | 12 | 19 | 543 | 97 |
| Total Analysis Volume [veh/h] | 65 | 44 | 78 | 399 | 34 | 271 | 335 | 1894 | 47 | 77 | 2170 | 389 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 110 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 10 | 0 | 0 | 42 | 0 | 18 | 48 | 0 | 10 | 40 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 28 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 7 | 7 | 7 | 21 | 21 | 13 | 60 | 60 | 6 | 54 | 54 |
| g / C, Green / Cycle | 0.06 | 0.06 | 0.06 | 0.19 | 0.19 | 0.11 | 0.55 | 0.55 | 0.05 | 0.49 | 0.49 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.03 | 0.04 | 0.11 | 0.16 | 0.10 | 0.34 | 0.35 | 0.04 | 0.38 | 0.20 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 3500 | 1900 | 3500 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 112 | 112 | 118 | 670 | 364 | 400 | 2073 | 1037 | 100 | 2773 | 924 |
| d1, Uniform Delay [s] | 49.91 | 49.93 | 50.48 | 40.61 | 42.86 | 47.75 | 17.12 | 17.49 | 51.32 | 23.43 | 18.25 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 3.20 | 3.28 | 6.12 | 0.85 | 5.17 | 4.69 | 1.38 | 3.05 | 11.90 | 2.28 | 1.41 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.48 | 0.49 | 0.66 | 0.60 | 0.84 | 0.84 | 0.62 | 0.64 | 0.77 | 0.78 | 0.42 |
| d, Delay for Lane Group [s/veh] | 53.11 | 53.22 | 56.60 | 41.46 | 48.03 | 52.44 | 18.50 | 20.53 | 63.22 | 25.72 | 19.66 |
| Lane Group LOS | D | D | E | D | D | D | B | C | E | C | B |
| Critical Lane Group | No | No | Yes | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 1.54 | 1.56 | 2.30 | 5.00 | 8.46 | 4.74 | 10.95 | 12.10 | 2.42 | 15.52 | 6.61 |
| 50th-Percentile Queue Length [ft/ln] | 38.47 | 39.05 | 57.48 | 124.92 | 211.43 | 118.58 | 273.65 | 302.47 | 60.53 | 387.93 | 165.36 |
| 95th-Percentile Queue Length [veh/ln] | 2.77 | 2.81 | 4.14 | 8.66 | 13.23 | 8.31 | 16.37 | 17.80 | 4.36 | 21.98 | 10.83 |
| 95th-Percentile Queue Length [ft/ln] | 69.25 | 70.30 | 103.47 | 216.56 | 330.66 | 207.87 | 409.29 | 445.08 | 108.96 | 549.43 | 270.81 |

**Movement, Approach, & Intersection Results**

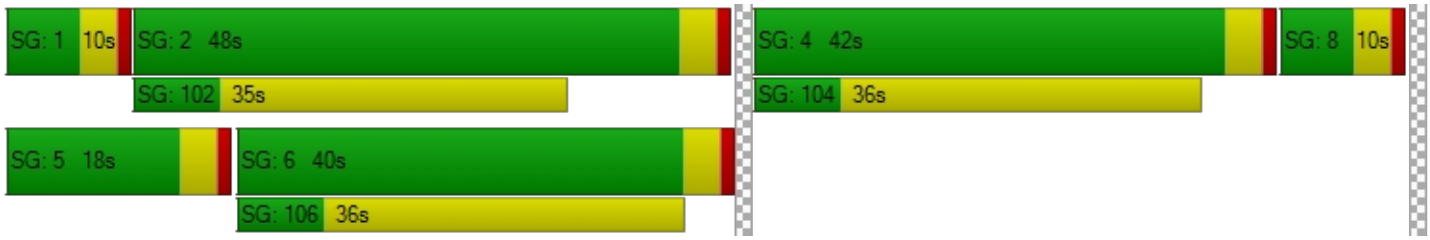
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 53.13 | 53.22 | 56.60 | 41.46 | 48.03 | 48.03 | 52.44 | 19.16 | 20.53 | 63.22 | 25.72 | 19.66 |
| Movement LOS | D | D | E | D | D | D | D | B | C | E | C | B |
| d_A, Approach Delay [s/veh] | 54.60 | | | 44.31 | | | 24.09 | | | 25.92 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 28.36 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.793 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 44.58 | 44.58 | 44.58 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.225 | 2.596 | 3.318 | 0.000 |
| Crosswalk LOS | B | B | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 109 | 691 | 800 | 654 |
| d_b, Bicycle Delay [s] | 49.19 | 23.59 | 19.82 | 24.91 |
| l_b,int, Bicycle LOS Score for Intersection | 1.714 | 2.721 | 2.811 | 3.009 |
| Bicycle LOS | A | B | C | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 67.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | E |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.061 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 391 | 625 | 370 | 463 | 323 | 98 | 112 | 1991 | 116 | 474 | 2019 | 574 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 391 | 625 | 370 | 463 | 323 | 98 | 112 | 1991 | 116 | 474 | 2019 | 574 |
| Peak Hour Factor | 0.8990 | 0.8990 | 0.8990 | 0.8970 | 0.8970 | 0.8970 | 0.9570 | 0.9570 | 0.9570 | 0.9550 | 0.9550 | 0.9550 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 109 | 174 | 103 | 129 | 90 | 27 | 29 | 520 | 30 | 124 | 529 | 150 |
| Total Analysis Volume [veh/h] | 435 | 695 | 412 | 516 | 360 | 109 | 117 | 2080 | 121 | 496 | 2114 | 601 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 20 | 41 | 0 | 28 | 49 | 0 | 12 | 34 | 0 | 17 | 39 | 39 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 23 | 0 | 0 | 23 | 23 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 16 | 30 | 30 | 24 | 38 | 38 | 6 | 37 | 37 | 13 | 45 | 73 |
| g / C, Green / Cycle | 0.13 | 0.25 | 0.25 | 0.20 | 0.31 | 0.31 | 0.05 | 0.31 | 0.31 | 0.11 | 0.37 | 0.60 |
| (v / s)_i Volume / Saturation Flow Rate | 0.12 | 0.18 | 0.22 | 0.26 | 0.13 | 0.12 | 0.03 | 0.29 | 0.30 | 0.14 | 0.37 | 0.32 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 2000 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 469 | 936 | 468 | 400 | 594 | 594 | 177 | 1772 | 591 | 383 | 2107 | 1146 |
| d1, Uniform Delay [s] | 51.42 | 41.75 | 43.56 | 48.04 | 32.58 | 32.21 | 56.02 | 39.89 | 40.92 | 53.50 | 37.86 | 13.83 |
| k, delay calibration | 0.11 | 0.11 | 0.24 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 8.36 | 1.19 | 11.26 | 134.17 | 0.46 | 0.40 | 4.18 | 9.02 | 31.36 | 137.62 | 20.34 | 1.72 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.93 | 0.74 | 0.88 | 1.29 | 0.41 | 0.38 | 0.66 | 0.92 | 0.97 | 1.30 | 1.00 | 0.52 |
| d, Delay for Lane Group [s/veh] | 59.79 | 42.93 | 54.82 | 182.21 | 33.04 | 32.61 | 60.20 | 48.92 | 72.28 | 191.12 | 58.20 | 15.55 |
| Lane Group LOS | E | D | D | F | C | C | E | D | E | F | F | B |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 7.00 | 9.62 | 13.17 | 13.42 | 5.69 | 5.18 | 1.85 | 16.69 | 21.74 | 13.08 | 24.15 | 9.62 |
| 50th-Percentile Queue Length [ft/ln] | 175.11 | 240.48 | 329.31 | 335.40 | 142.23 | 129.45 | 46.16 | 417.25 | 543.43 | 326.96 | 603.69 | 240.45 |
| 95th-Percentile Queue Length [veh/ln] | 11.34 | 14.71 | 19.12 | 21.76 | 9.60 | 8.91 | 3.32 | 23.39 | 29.38 | 20.91 | 32.28 | 14.70 |
| 95th-Percentile Queue Length [ft/ln] | 283.62 | 367.64 | 478.12 | 544.04 | 240.03 | 222.75 | 83.08 | 584.75 | 734.59 | 522.74 | 806.97 | 367.60 |

**Movement, Approach, & Intersection Results**

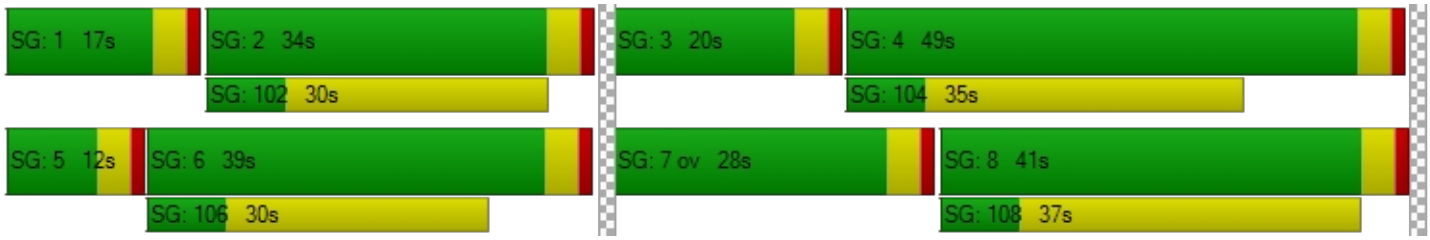
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 59.79 | 42.93 | 54.82 | 182.21 | 32.90 | 32.61 | 60.20 | 54.03 | 72.28 | 191.12 | 58.20 | 15.55 |
| Movement LOS | E | D | D | F | C | C | E | D | E | F | F | B |
| d_A, Approach Delay [s/veh] | 50.86 | | | 111.08 | | | 55.29 | | | 70.75 | | |
| Approach LOS | D | | | F | | | E | | | E | | |
| d_I, Intersection Delay [s/veh] | 67.43 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |
| Intersection V/C | 1.061 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.959 | 2.856 | 3.402 | 3.587 |
| Crosswalk LOS | C | C | C | D |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 616 | 750 | 500 | 583 |
| d_b, Bicycle Delay [s] | 28.73 | 23.46 | 33.78 | 30.13 |
| l_b,int, Bicycle LOS Score for Intersection | 2.832 | 2.372 | 2.516 | 3.326 |
| Bicycle LOS | C | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 17.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.773 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 687 | 0 | 571 | 0 | 1800 | 1043 | 0 | 2492 | 417 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 687 | 0 | 571 | 0 | 1800 | 1043 | 0 | 2492 | 417 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 0.9390 | 1.0000 | 0.9390 | 1.0000 | 0.9540 | 0.9540 | 1.0000 | 0.9730 | 0.9730 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 183 | 0 | 152 | 0 | 472 | 273 | 0 | 640 | 107 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 732 | 0 | 608 | 0 | 1887 | 1093 | 0 | 2561 | 429 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_di, Inbound Pedestrian Volume crossing m | | 0 | | | 0 | | | 0 | | | 0 | |
| v_co, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ci, Inbound Pedestrian Volume crossing mi | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ab, Corner Pedestrian Volume [ped/h] | | 0 | | | 0 | | | 0 | | | 0 | |
| Bicycle Volume [bicycles/h] | | 0 | | | 0 | | | 0 | | | 0 | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 8.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 64 | 0 | 0 | 0 | 26 | 0 | 0 | 26 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | | No | |
| Maximum Recall | | | | No | | | | No | | | No | |
| Pedestrian Recall | | | | No | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | C | R | C | C |
|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 27 | 27 | 27 | 54 | 54 |
| g / C, Green / Cycle | | 0.31 | 0.31 | 0.31 | 0.61 | 0.61 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.26 | 0.26 | 0.24 | 0.33 | 0.45 |
| s, saturation flow rate [veh/h] | | 1750 | 1750 | 1900 | 5700 | 5700 |
| c, Capacity [veh/h] | | 533 | 533 | 579 | 3456 | 3456 |
| d1, Uniform Delay [s] | | 29.16 | 29.16 | 28.39 | 10.41 | 12.64 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 3.59 | 3.59 | 2.22 | 0.62 | 1.47 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.84 | 0.84 | 0.77 | 0.55 | 0.74 |
| d, Delay for Lane Group [s/veh] | | 32.76 | 32.76 | 30.62 | 11.03 | 14.11 |
| Lane Group LOS | | C | C | C | B | B |
| Critical Lane Group | | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | | 9.21 | 9.21 | 8.81 | 6.75 | 11.26 |
| 50th-Percentile Queue Length [ft/ln] | | 230.25 | 230.25 | 220.17 | 168.63 | 281.53 |
| 95th-Percentile Queue Length [veh/ln] | | 14.19 | 14.19 | 13.67 | 11.00 | 16.76 |
| 95th-Percentile Queue Length [ft/ln] | | 354.68 | 354.68 | 341.84 | 275.11 | 419.12 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 32.76 | 0.00 | 31.19 | 0.00 | 11.03 | 0.00 | 0.00 | 14.11 | 0.00 |
| Movement LOS | | | | C | | C | | B | | | B | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 32.04 | | | 11.03 | | | 14.11 | | |
| Approach LOS | A | | | C | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 17.26 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.773 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 0.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 0.00 | 34.63 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 0.000 | 2.457 | 0.000 | 0.000 |
| Crosswalk LOS | F | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 1335 | 489 | 489 |
| d_b, Bicycle Delay [s] | 44.96 | 4.98 | 25.65 | 25.65 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 3.771 | 2.597 | 2.968 |
| Bicycle LOS | D | D | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 23.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.799 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1052 | 64 | 453 | 0 | 0 | 193 | 183 | 1936 | 385 | 0 | 2546 | 38 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1052 | 64 | 453 | 0 | 0 | 193 | 183 | 1936 | 385 | 0 | 2546 | 38 |
| Peak Hour Factor | 0.9490 | 0.9490 | 0.9490 | 1.0000 | 1.0000 | 0.8840 | 0.9510 | 0.9510 | 0.9510 | 1.0000 | 0.9830 | 0.9830 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 277 | 17 | 119 | 0 | 0 | 55 | 48 | 509 | 101 | 0 | 648 | 10 |
| Total Analysis Volume [veh/h] | 1109 | 67 | 477 | 0 | 0 | 218 | 192 | 2036 | 405 | 0 | 2590 | 39 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 0 | 6 | 6 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 39 | 0 | 0 | 0 | 21 | 21 | 51 | 0 | 0 | 30 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | | No | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | | No | No | No | | | No | |
| Maximum Recall | | No | | | | No | No | No | | | No | |
| Pedestrian Recall | | No | | | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 27 | 27 | 27 | 12 | 12 | 55 | 40 | 40 |
| g / C, Green / Cycle | 0.30 | 0.30 | 0.30 | 0.13 | 0.13 | 0.62 | 0.44 | 0.44 |
| (v / s)_i Volume / Saturation Flow Rate | 0.23 | 0.24 | 0.22 | 0.06 | 0.11 | 0.36 | 0.35 | 0.35 |
| s, saturation flow rate [veh/h] | 3500 | 1750 | 1900 | 3800 | 1800 | 5700 | 5700 | 1900 |
| c, Capacity [veh/h] | 1034 | 517 | 562 | 501 | 237 | 3509 | 2505 | 835 |
| d1, Uniform Delay [s] | 29.12 | 29.38 | 28.67 | 36.01 | 38.00 | 10.35 | 21.63 | 21.63 |
| k, delay calibration | 0.11 | 0.17 | 0.14 | 0.11 | 0.11 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.37 | 4.88 | 2.54 | 0.60 | 6.49 | 0.71 | 2.59 | 7.40 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.79 | 0.81 | 0.75 | 0.44 | 0.81 | 0.58 | 0.79 | 0.79 |
| d, Delay for Lane Group [s/veh] | 30.49 | 34.27 | 31.21 | 36.61 | 44.49 | 11.06 | 24.22 | 29.03 |
| Lane Group LOS | C | C | C | D | D | B | C | C |
| Critical Lane Group | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 8.02 | 8.83 | 8.32 | 2.22 | 4.48 | 7.33 | 11.78 | 12.89 |
| 50th-Percentile Queue Length [ft/ln] | 200.40 | 220.70 | 208.11 | 55.49 | 111.89 | 183.24 | 294.42 | 322.33 |
| 95th-Percentile Queue Length [veh/ln] | 12.66 | 13.70 | 13.06 | 4.00 | 7.95 | 11.77 | 17.40 | 18.78 |
| 95th-Percentile Queue Length [ft/ln] | 316.48 | 342.52 | 326.40 | 99.88 | 198.63 | 294.24 | 435.12 | 469.54 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 31.47 | 34.27 | 31.62 | 0.00 | 0.00 | 36.61 | 44.49 | 11.06 | 0.00 | 0.00 | 25.36 | 29.03 |
| Movement LOS | C | C | C | | | D | D | B | | | C | C |
| d_A, Approach Delay [s/veh] | 31.63 | | | 36.61 | | | 13.94 | | | 25.42 | | |
| Approach LOS | C | | | D | | | B | | | C | | |
| d_I, Intersection Delay [s/veh] | 23.50 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.799 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.622 | 2.107 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 778 | 378 | 1044 | 578 |
| d_b, Bicycle Delay [s] | 16.82 | 29.62 | 10.28 | 22.77 |
| l_b,int, Bicycle LOS Score for Intersection | 4.287 | 1.560 | 2.785 | 2.644 |
| Bicycle LOS | E | A | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 46.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.918 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 225 | 262 | 86 | 297 | 353 | 264 | 280 | 1944 | 146 | 178 | 1846 | 191 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 225 | 262 | 86 | 297 | 353 | 264 | 280 | 1944 | 146 | 178 | 1846 | 191 |
| Peak Hour Factor | 0.9100 | 0.9100 | 0.9100 | 0.8290 | 0.8290 | 0.8290 | 0.9480 | 0.9480 | 0.9480 | 0.9350 | 0.9350 | 0.9350 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 62 | 72 | 24 | 90 | 106 | 80 | 74 | 513 | 39 | 48 | 494 | 51 |
| Total Analysis Volume [veh/h] | 247 | 288 | 95 | 358 | 426 | 318 | 295 | 2051 | 154 | 190 | 1974 | 204 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 13 | 39 | 0 | 18 | 44 | 0 | 26 | 45 | 0 | 18 | 37 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 29 | 0 | 0 | 26 | 0 | 0 | 25 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 9 | 25 | 25 | 14 | 30 | 30 | 21 | 51 | 51 | 14 | 44 | 44 |
| g / C, Green / Cycle | 0.08 | 0.21 | 0.21 | 0.12 | 0.25 | 0.25 | 0.18 | 0.43 | 0.43 | 0.12 | 0.36 | 0.36 |
| (v / s)_i Volume / Saturation Flow Rate | 0.07 | 0.10 | 0.10 | 0.10 | 0.22 | 0.17 | 0.16 | 0.38 | 0.40 | 0.11 | 0.28 | 0.29 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 267 | 393 | 393 | 412 | 471 | 471 | 322 | 1615 | 807 | 212 | 2073 | 691 |
| d1, Uniform Delay [s] | 55.14 | 42.22 | 41.86 | 52.10 | 43.79 | 40.80 | 48.43 | 32.17 | 32.83 | 52.29 | 33.96 | 34.48 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.22 | 0.11 | 0.20 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 12.98 | 1.01 | 0.87 | 5.75 | 12.47 | 1.70 | 16.75 | 8.49 | 18.55 | 12.65 | 3.00 | 9.96 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.93 | 0.51 | 0.47 | 0.87 | 0.90 | 0.68 | 0.92 | 0.90 | 0.93 | 0.90 | 0.78 | 0.81 |
| d, Delay for Lane Group [s/veh] | 68.12 | 43.23 | 42.73 | 57.85 | 56.26 | 42.49 | 65.18 | 40.66 | 51.37 | 64.93 | 36.96 | 44.44 |
| Lane Group LOS | E | D | D | E | E | D | E | D | D | E | D | D |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 4.19 | 5.35 | 4.90 | 5.62 | 13.82 | 8.70 | 10.15 | 21.06 | 24.33 | 6.39 | 14.37 | 16.44 |
| 50th-Percentile Queue Length [ft/ln] | 104.86 | 133.66 | 122.58 | 140.62 | 345.48 | 217.46 | 253.66 | 526.58 | 608.34 | 159.64 | 359.22 | 411.04 |
| 95th-Percentile Queue Length [veh/ln] | 7.55 | 9.14 | 8.53 | 9.51 | 19.92 | 13.54 | 15.37 | 28.59 | 32.42 | 10.53 | 20.59 | 23.09 |
| 95th-Percentile Queue Length [ft/ln] | 188.75 | 228.47 | 213.37 | 237.86 | 497.89 | 338.38 | 384.26 | 714.75 | 810.59 | 263.25 | 514.64 | 577.29 |

**Movement, Approach, & Intersection Results**

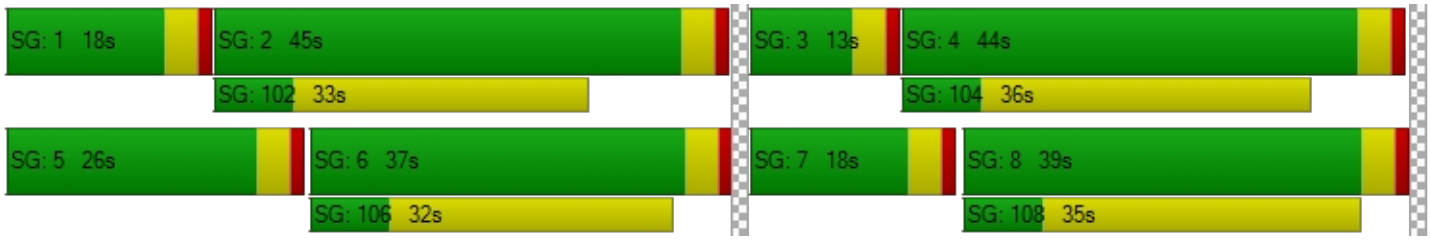
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 68.12 | 43.08 | 42.73 | 57.85 | 56.26 | 42.49 | 65.18 | 43.78 | 51.37 | 64.93 | 38.31 | 44.44 |
| Movement LOS | E | D | D | E | E | D | E | D | D | E | D | D |
| d_A, Approach Delay [s/veh] | 52.85 | | | 52.80 | | | 46.77 | | | 40.98 | | |
| Approach LOS | D | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 46.28 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.918 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.587 | 2.774 | 3.353 | 3.333 |
| Crosswalk LOS | B | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 583 | 666 | 683 | 550 |
| d_b, Bicycle Delay [s] | 30.13 | 26.69 | 26.03 | 31.57 |
| l_b,int, Bicycle LOS Score for Intersection | 2.079 | 3.378 | 2.935 | 2.536 |
| Bicycle LOS | B | C | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 26.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.837 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 263 | 48 | 272 | 26 | 23 | 15 | 19 | 1951 | 291 | 237 | 2015 | 58 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 263 | 48 | 272 | 26 | 23 | 15 | 19 | 1951 | 291 | 237 | 2015 | 58 |
| Peak Hour Factor | 0.8580 | 0.8580 | 0.8580 | 0.6480 | 0.6480 | 0.6480 | 0.9520 | 0.9520 | 0.9520 | 0.9460 | 0.9460 | 0.9460 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 77 | 14 | 79 | 10 | 9 | 6 | 5 | 512 | 76 | 63 | 533 | 15 |
| Total Analysis Volume [veh/h] | 307 | 56 | 317 | 40 | 35 | 23 | 20 | 2049 | 306 | 251 | 2130 | 61 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 95 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 27 | 0 | 0 | 10 | 0 | 10 | 32 | 0 | 26 | 48 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 14 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 18 | 18 | 18 | 6 | 6 | 3 | 40 | 40 | 15 | 53 | 53 |
| g / C, Green / Cycle | 0.19 | 0.19 | 0.19 | 0.06 | 0.06 | 0.03 | 0.42 | 0.42 | 0.16 | 0.55 | 0.55 |
| (v / s)_i Volume / Saturation Flow Rate | 0.10 | 0.10 | 0.17 | 0.02 | 0.03 | 0.01 | 0.36 | 0.16 | 0.14 | 0.38 | 0.40 |
| s, saturation flow rate [veh/h] | 1750 | 1750 | 1900 | 1800 | 1900 | 1800 | 5700 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 338 | 338 | 367 | 107 | 113 | 49 | 2380 | 793 | 291 | 2097 | 1049 |
| d1, Uniform Delay [s] | 34.52 | 34.57 | 37.16 | 43.05 | 43.42 | 45.53 | 25.20 | 19.24 | 38.87 | 15.39 | 15.79 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.31 | 1.34 | 6.08 | 2.15 | 3.58 | 5.37 | 4.37 | 1.42 | 7.53 | 1.86 | 4.19 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.53 | 0.54 | 0.86 | 0.37 | 0.51 | 0.41 | 0.86 | 0.39 | 0.86 | 0.69 | 0.72 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 35.83 | 35.91 | 43.24 | 45.20 | 46.99 | 50.90 | 29.57 | 20.65 | 46.40 | 17.24 | 19.98 |
| Lane Group LOS | D | D | D | D | D | D | C | C | D | B | B |
| Critical Lane Group | No | No | Yes | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 3.82 | 3.88 | 7.62 | 0.96 | 1.43 | 0.53 | 14.28 | 4.87 | 6.23 | 10.91 | 12.31 |
| 50th-Percentile Queue Length [ft/ln] | 95.61 | 96.99 | 190.60 | 24.07 | 35.67 | 13.37 | 357.01 | 121.69 | 155.74 | 272.68 | 307.74 |
| 95th-Percentile Queue Length [veh/ln] | 6.88 | 6.98 | 12.15 | 1.73 | 2.57 | 0.96 | 20.48 | 8.49 | 10.32 | 16.32 | 18.06 |
| 95th-Percentile Queue Length [ft/ln] | 172.10 | 174.58 | 303.80 | 43.33 | 64.20 | 24.06 | 511.94 | 212.14 | 258.07 | 408.09 | 451.59 |

**Movement, Approach, & Intersection Results**

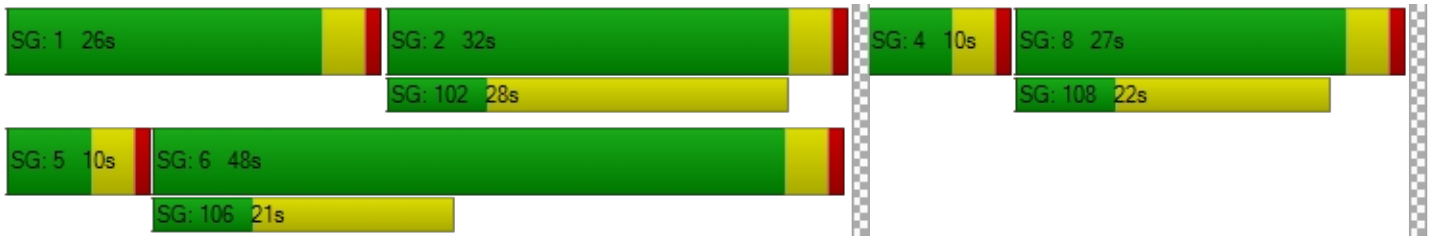
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 35.86 | 35.91 | 43.24 | 45.20 | 46.99 | 46.99 | 50.90 | 29.57 | 20.65 | 46.40 | 18.13 | 19.98 |
| Movement LOS | D | D | D | D | D | D | D | C | C | D | B | B |
| d_A, Approach Delay [s/veh] | 39.31 | | | 46.26 | | | 28.60 | | | 21.08 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 26.93 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.837 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 37.18 | 37.18 | 0.00 | 37.18 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.443 | 2.019 | 0.000 | 3.271 |
| Crosswalk LOS | B | B | F | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 484 | 126 | 589 | 926 |
| d_b, Bicycle Delay [s] | 27.32 | 41.73 | 23.66 | 13.72 |
| l_b,int, Bicycle LOS Score for Intersection | 2.682 | 1.721 | 2.866 | 2.903 |
| Bicycle LOS | B | A | C | C |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



Brea Mall Expansion, Brea

Vistro File: N:\...\4099 HCM Network.vistro
Report File: N:\...\Sat 2026+P.pdf

Scenario 9 Sat MD 2026+P
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | HCM 6th Edition | WB Left | 0.903 | 45.1 | D |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | HCM 6th Edition | WB Left | 0.790 | 29.1 | C |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | HCM 6th Edition | NB Left | 0.774 | 19.2 | B |
| 4 | Randolph Avenue at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.516 | 20.0 | B |
| 5 | State College Boulevard at Birch Street | Signalized | HCM 6th Edition | NB Left | 0.797 | 41.3 | D |
| 6 | S Associated Road at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.610 | 21.2 | C |
| 7 | Randolph Avenue at Madison Way | Signalized | HCM 6th Edition | WB Left | 0.263 | 20.4 | C |
| 8 | Randolph Avenue at Brea Mall | Signalized | HCM 6th Edition | EB Left | 0.554 | 26.0 | C |
| 9 | Brea Mall South at State College Boulevard | Signalized | HCM 6th Edition | WB Left | 0.881 | 33.6 | C |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.759 | 39.9 | D |
| 11 | Puente Street at Imperial Highway | Signalized | HCM 6th Edition | EB Left | 0.518 | 14.2 | B |
| 12 | Brea Boulevard at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.930 | 49.6 | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.950 | 52.9 | D |
| 14 | State College Boulevard at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 1.394 | 165.2 | F |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.856 | 21.1 | C |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | HCM 6th Edition | EB Left | 0.859 | 34.0 | C |
| 17 | Associated Road at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.855 | 37.3 | D |
| 18 | Castlegate Lane/Placentia | Signalized | HCM 6th | EB Left | 0.816 | 23.6 | C |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | Edition | EB Left | 0.616 | 23.6 | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 45.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.903 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 139 | 280 | 398 | 547 | 389 | 5 | 19 | 1230 | 276 | 747 | 1631 | 751 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 139 | 280 | 398 | 547 | 389 | 5 | 19 | 1230 | 276 | 747 | 1631 | 751 |
| Peak Hour Factor | 0.9010 | 0.9010 | 0.9010 | 0.8760 | 0.8760 | 0.8760 | 0.8390 | 0.8390 | 0.8390 | 0.9650 | 0.9650 | 0.9650 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 39 | 78 | 110 | 156 | 111 | 1 | 6 | 367 | 82 | 194 | 423 | 195 |
| Total Analysis Volume [veh/h] | 154 | 311 | 442 | 624 | 444 | 6 | 23 | 1466 | 329 | 774 | 1690 | 778 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 10 | 27 | 0 | 27 | 44 | 0 | 10 | 39 | 0 | 27 | 56 | 56 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 28 | 0 | 0 | 22 | 22 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 6 | 20 | 20 | 20 | 23 | 37 | 37 | 3 | 38 | 38 | 23 | 58 | 85 |
| g / C, Green / Cycle | 0.05 | 0.17 | 0.17 | 0.17 | 0.19 | 0.31 | 0.31 | 0.03 | 0.32 | 0.32 | 0.19 | 0.48 | 0.71 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.15 | 0.13 | 0.12 | 0.18 | 0.12 | 0.12 | 0.01 | 0.24 | 0.23 | 0.22 | 0.30 | 0.41 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1900 | 3500 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 178 | 317 | 317 | 317 | 671 | 585 | 585 | 97 | 1804 | 601 | 671 | 2739 | 1341 |
| d1, Uniform Delay [s] | 56.58 | 48.80 | 47.73 | 47.59 | 47.72 | 32.65 | 32.63 | 57.13 | 36.80 | 36.49 | 48.52 | 23.02 | 8.81 |
| k, delay calibration | 0.11 | 0.14 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 11.90 | 9.76 | 3.75 | 3.46 | 6.37 | 0.42 | 0.41 | 1.24 | 2.94 | 7.66 | 72.98 | 1.05 | 1.84 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.87 | 0.87 | 0.76 | 0.74 | 0.93 | 0.39 | 0.38 | 0.24 | 0.75 | 0.73 | 1.15 | 0.62 | 0.58 |
| d, Delay for Lane Group [s/veh] | 68.48 | 58.56 | 51.49 | 51.05 | 54.09 | 33.06 | 33.04 | 58.37 | 39.73 | 44.15 | 121.50 | 24.07 | 10.64 |
| Lane Group LOS | E | E | D | D | D | C | C | E | D | D | F | C | B |
| Critical Lane Group | No | Yes | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.61 | 8.93 | 7.19 | 7.00 | 9.73 | 5.23 | 5.21 | 0.36 | 12.29 | 12.67 | 16.80 | 11.81 | 9.79 |
| 50th-Percentile Queue Length [ft/ln] | 65.29 | 223.2 | 179.7 | 174.9 | 243.28 | 130.85 | 130.16 | 8.97 | 307.14 | 316.64 | 419.95 | 295.27 | 244.79 |
| 95th-Percentile Queue Length [veh/ln] | 4.70 | 13.83 | 11.59 | 11.34 | 14.85 | 8.99 | 8.95 | 0.65 | 18.03 | 18.50 | 25.25 | 17.45 | 14.92 |
| 95th-Percentile Queue Length [ft/ln] | 117.5 | 345.7 | 289.7 | 283.4 | 371.17 | 224.66 | 223.71 | 16.15 | 450.85 | 462.56 | 631.36 | 436.17 | 373.09 |

**Movement, Approach, & Intersection Results**

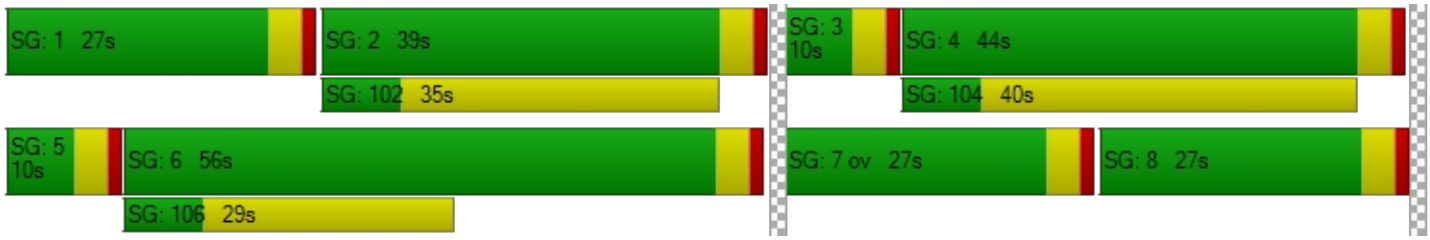
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 68.48 | 57.78 | 51.24 | 54.09 | 33.05 | 33.04 | 58.37 | 40.07 | 44.15 | 121.50 | 24.07 | 10.64 |
| Movement LOS | E | E | D | D | C | C | E | D | D | F | C | B |
| d_A, Approach Delay [s/veh] | 56.42 | | | 45.27 | | | 41.04 | | | 44.11 | | |
| Approach LOS | E | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 45.08 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.903 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.950 | 2.822 | 3.260 | 0.000 |
| Crosswalk LOS | C | C | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 383 | 666 | 583 | 866 |
| d_b, Bicycle Delay [s] | 39.22 | 26.68 | 30.12 | 19.28 |
| l_b,int, Bicycle LOS Score for Intersection | 2.308 | 2.446 | 2.310 | 3.343 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 29.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.790 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 837 | 0 | 1249 | 0 | 1580 | 580 | 199 | 1877 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 837 | 0 | 1249 | 0 | 1580 | 580 | 199 | 1877 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 0.9460 | 1.0000 | 0.9460 | 1.0000 | 0.9230 | 0.9230 | 0.9510 | 0.9510 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 221 | 0 | 330 | 0 | 428 | 157 | 52 | 493 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 885 | 0 | 1320 | 0 | 1712 | 628 | 209 | 1974 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 115 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 79 | 0 | 0 | 0 | 23 | 0 | 13 | 36 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 20 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | No | No | |
| Maximum Recall | | | | No | | | | No | | No | No | |
| Pedestrian Recall | | | | No | | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | R | C | R | L | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 115 | 115 | 115 | 115 | 115 | 115 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 50 | 50 | 44 | 44 | 9 | 57 |
| g / C, Green / Cycle | | 0.44 | 0.44 | 0.38 | 0.38 | 0.08 | 0.49 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.25 | 0.35 | 0.30 | 0.17 | 0.06 | 0.35 |
| s, saturation flow rate [veh/h] | | 3500 | 3800 | 5700 | 3800 | 3500 | 5700 |
| c, Capacity [veh/h] | | 1535 | 1667 | 2169 | 1446 | 268 | 2803 |
| d1, Uniform Delay [s] | | 24.25 | 27.76 | 31.52 | 26.42 | 52.14 | 22.71 |
| k, delay calibration | | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 0.34 | 0.88 | 3.01 | 0.95 | 4.94 | 1.51 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.58 | 0.79 | 0.79 | 0.43 | 0.78 | 0.70 |
| d, Delay for Lane Group [s/veh] | | 24.59 | 28.64 | 34.53 | 27.37 | 57.07 | 24.22 |
| Lane Group LOS | | C | C | C | C | E | C |
| Critical Lane Group | | No | Yes | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | | 8.98 | 15.42 | 14.39 | 6.55 | 3.14 | 13.83 |
| 50th-Percentile Queue Length [ft/ln] | | 224.55 | 385.38 | 359.65 | 163.67 | 78.54 | 345.75 |
| 95th-Percentile Queue Length [veh/ln] | | 13.90 | 21.85 | 20.61 | 10.74 | 5.66 | 19.93 |
| 95th-Percentile Queue Length [ft/ln] | | 347.42 | 546.35 | 515.16 | 268.58 | 141.38 | 498.23 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 24.59 | 0.00 | 28.64 | 0.00 | 34.53 | 27.37 | 57.07 | 24.22 | 0.00 |
| Movement LOS | | | | C | | C | | C | C | E | C | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 27.01 | | | 32.61 | | | 27.36 | | |
| Approach LOS | A | | | C | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 29.07 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.790 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 47.01 | 47.01 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.135 | 2.680 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 1305 | 331 | 557 |
| d_b, Bicycle Delay [s] | 57.49 | 6.95 | 40.06 | 29.94 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 1.560 | 2.847 | 2.760 |
| Bicycle LOS | D | A | C | C |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 19.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.774 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | | | | No | | | No | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1104 | 0 | 467 | 0 | 0 | 0 | 0 | 1699 | 722 | 0 | 971 | 425 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1104 | 0 | 467 | 0 | 0 | 0 | 0 | 1699 | 722 | 0 | 971 | 425 |
| Peak Hour Factor | 0.9860 | 1.0000 | 0.9860 | 1.0000 | 1.0000 | 1.0000 | 0.9710 | 0.9080 | 0.9080 | 1.0000 | 0.9400 | 0.9400 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 280 | 0 | 118 | 0 | 0 | 0 | 0 | 468 | 199 | 0 | 258 | 0 |
| Total Analysis Volume [veh/h] | 1120 | 0 | 474 | 0 | 0 | 0 | 0 | 1871 | 795 | 0 | 1033 | 0 |
| Presence of On-Street Parking | No | | No | | | | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 54 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 36 | 0 |
| Vehicle Extension [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | No | | | | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | | | | | | | No | | | No | |
| Maximum Recall | No | | | | | | | No | | | No | |
| Pedestrian Recall | No | | | | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | R | | C | C | R | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 34 | 34 | | 48 | 48 | 48 | 48 |
| g / C, Green / Cycle | 0.38 | 0.38 | | 0.53 | 0.53 | 0.53 | 0.53 |
| (v / s)_i Volume / Saturation Flow Rate | 0.32 | 0.25 | | 0.35 | 0.35 | 0.35 | 0.18 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | | 3800 | 1900 | 1900 | 5700 |
| c, Capacity [veh/h] | 1319 | 716 | | 2030 | 1015 | 1015 | 3045 |
| d1, Uniform Delay [s] | 25.65 | 23.24 | | 15.02 | 15.02 | 15.02 | 11.91 |
| k, delay calibration | 0.11 | 0.11 | | 0.50 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.62 | 1.06 | | 1.68 | 3.32 | 3.32 | 0.30 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.85 | 0.66 | | 0.66 | 0.66 | 0.66 | 0.34 |
| d, Delay for Lane Group [s/veh] | 27.27 | 24.30 | | 16.69 | 18.34 | 18.34 | 12.21 |
| Lane Group LOS | C | C | | B | B | B | B |
| Critical Lane Group | Yes | No | | Yes | No | No | No |
| 50th-Percentile Queue Length [veh/ln] | 10.73 | 8.21 | | 9.47 | 9.93 | 9.93 | 3.77 |
| 50th-Percentile Queue Length [ft/ln] | 268.20 | 205.24 | | 236.76 | 248.34 | 248.34 | 94.28 |
| 95th-Percentile Queue Length [veh/ln] | 16.10 | 12.91 | | 14.52 | 15.10 | 15.10 | 6.79 |
| 95th-Percentile Queue Length [ft/ln] | 402.49 | 322.71 | | 362.93 | 377.57 | 377.57 | 169.70 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 27.27 | 0.00 | 24.30 | 0.00 | 0.00 | 0.00 | 0.00 | 16.78 | 18.34 | 0.00 | 12.21 | 0.00 |
| Movement LOS | C | | C | | | | | B | B | | B | |
| d_A, Approach Delay [s/veh] | 26.39 | | | 0.00 | | | 17.52 | | | 12.21 | | |
| Approach LOS | C | | | A | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 19.15 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.774 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 0.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.63 | 0.00 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.765 | 0.000 | 0.000 | 0.000 |
| Crosswalk LOS | C | F | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1112 | 0 | 712 | 712 |
| d_b, Bicycle Delay [s] | 8.86 | 44.96 | 18.65 | 18.65 |
| l_b,int, Bicycle LOS Score for Intersection | 1.560 | 4.132 | 3.026 | 2.128 |
| Bicycle LOS | A | D | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 20.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.516 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 115 | 78 | 185 | 56 | 39 | 80 | 89 | 701 | 134 | 161 | 849 | 26 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 115 | 78 | 185 | 56 | 39 | 80 | 89 | 701 | 134 | 161 | 849 | 26 |
| Peak Hour Factor | 0.8630 | 0.8630 | 0.8630 | 0.7790 | 0.7790 | 0.7790 | 0.9320 | 0.9320 | 0.9320 | 0.9670 | 0.9670 | 0.9670 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 33 | 23 | 54 | 18 | 13 | 26 | 24 | 188 | 36 | 42 | 219 | 7 |
| Total Analysis Volume [veh/h] | 133 | 90 | 214 | 72 | 50 | 103 | 95 | 752 | 144 | 166 | 878 | 27 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 38 | 0 | 0 | 38 | 0 | 12 | 30 | 0 | 22 | 40 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 25 | 0 | 0 | 19 | 0 | 0 | 18 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 13 | 13 | 13 | 13 | 13 | 6 | 55 | 55 | 10 | 59 | 59 |
| g / C, Green / Cycle | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.07 | 0.61 | 0.61 | 0.11 | 0.66 | 0.66 |
| (v / s)_i Volume / Saturation Flow Rate | 0.07 | 0.05 | 0.11 | 0.04 | 0.08 | 0.05 | 0.24 | 0.23 | 0.09 | 0.23 | 0.01 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 171 | 271 | 271 | 228 | 271 | 125 | 1159 | 1159 | 205 | 2489 | 1244 |
| d1, Uniform Delay [s] | 35.76 | 34.76 | 37.32 | 34.50 | 36.02 | 41.20 | 9.04 | 8.88 | 38.94 | 6.98 | 5.44 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 7.43 | 0.71 | 5.12 | 0.78 | 1.85 | 9.18 | 1.02 | 0.93 | 7.35 | 0.39 | 0.03 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.78 | 0.33 | 0.79 | 0.32 | 0.56 | 0.76 | 0.40 | 0.38 | 0.81 | 0.35 | 0.02 |
| d, Delay for Lane Group [s/veh] | 43.19 | 35.48 | 42.44 | 35.28 | 37.86 | 50.38 | 10.06 | 9.81 | 46.30 | 7.37 | 5.47 |
| Lane Group LOS | D | D | D | D | D | D | B | A | D | A | A |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 3.02 | 1.81 | 4.87 | 1.44 | 3.23 | 2.37 | 4.49 | 4.16 | 3.95 | 3.40 | 0.17 |
| 50th-Percentile Queue Length [ft/ln] | 75.51 | 45.21 | 121.63 | 36.07 | 80.74 | 59.15 | 112.22 | 104.06 | 98.68 | 84.94 | 4.19 |
| 95th-Percentile Queue Length [veh/ln] | 5.44 | 3.26 | 8.48 | 2.60 | 5.81 | 4.26 | 7.96 | 7.49 | 7.10 | 6.12 | 0.30 |
| 95th-Percentile Queue Length [ft/ln] | 135.91 | 81.38 | 212.06 | 64.92 | 145.34 | 106.47 | 199.08 | 187.30 | 177.62 | 152.89 | 7.54 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 43.19 | 35.48 | 42.44 | 35.28 | 37.86 | 37.86 | 50.38 | 9.96 | 9.81 | 46.30 | 7.37 | 5.47 |
| Movement LOS | D | D | D | D | D | D | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 41.23 | | | 37.04 | | | 13.82 | | | 13.35 | | |
| Approach LOS | D | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 19.95 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.516 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.70 | 34.70 | 34.70 | 34.70 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.325 | 2.082 | 2.899 | 2.898 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 755 | 755 | 577 | 800 |
| d_b, Bicycle Delay [s] | 17.44 | 17.44 | 22.78 | 16.22 |
| l_b,int, Bicycle LOS Score for Intersection | 2.281 | 1.931 | 2.377 | 2.443 |
| Bicycle LOS | B | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 41.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.797 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 130 | 337 | 188 | 287 | 620 | 506 | 306 | 785 | 171 | 173 | 753 | 257 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 130 | 337 | 188 | 287 | 620 | 506 | 306 | 785 | 171 | 173 | 753 | 257 |
| Peak Hour Factor | 0.9440 | 0.9440 | 0.9440 | 0.9150 | 0.9150 | 0.9150 | 0.9030 | 0.9030 | 0.9030 | 0.9260 | 0.9260 | 0.9260 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 34 | 89 | 50 | 78 | 169 | 138 | 85 | 217 | 47 | 47 | 203 | 69 |
| Total Analysis Volume [veh/h] | 138 | 357 | 199 | 314 | 678 | 553 | 339 | 869 | 189 | 187 | 813 | 278 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 10 | 39 | 0 | 27 | 56 | 0 | 17 | 42 | 0 | 12 | 37 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 37 | 37 | 13 | 44 | 44 | 13 | 46 | 46 | 8 | 41 | 41 |
| g / C, Green / Cycle | 0.05 | 0.31 | 0.31 | 0.11 | 0.37 | 0.37 | 0.11 | 0.38 | 0.38 | 0.07 | 0.34 | 0.34 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.09 | 0.10 | 0.09 | 0.34 | 0.31 | 0.10 | 0.23 | 0.10 | 0.05 | 0.21 | 0.15 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 3500 | 1900 | 1900 | 3500 | 3800 | 1900 | 3500 | 3800 | 1900 |
| c, Capacity [veh/h] | 176 | 1171 | 585 | 386 | 699 | 699 | 380 | 1450 | 725 | 235 | 1292 | 646 |
| d1, Uniform Delay [s] | 56.34 | 31.72 | 32.10 | 52.20 | 36.38 | 34.62 | 52.80 | 29.77 | 25.50 | 55.19 | 33.27 | 30.63 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.31 | 0.25 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 7.39 | 0.15 | 0.34 | 4.21 | 14.12 | 6.08 | 7.34 | 1.84 | 0.87 | 6.11 | 2.33 | 2.09 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.78 | 0.30 | 0.34 | 0.81 | 0.93 | 0.83 | 0.89 | 0.60 | 0.26 | 0.80 | 0.63 | 0.43 |
| d, Delay for Lane Group [s/veh] | 63.73 | 31.86 | 32.44 | 56.41 | 50.50 | 40.69 | 60.15 | 31.61 | 26.37 | 61.31 | 35.60 | 32.72 |
| Lane Group LOS | E | C | C | E | D | D | E | C | C | E | D | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 2.25 | 4.00 | 4.54 | 4.84 | 20.60 | 16.49 | 5.42 | 10.36 | 3.90 | 2.99 | 10.31 | 6.60 |
| 50th-Percentile Queue Length [ft/ln] | 56.21 | 99.97 | 113.51 | 121.12 | 514.90 | 412.30 | 135.61 | 259.02 | 97.45 | 74.68 | 257.70 | 165.05 |
| 95th-Percentile Queue Length [veh/ln] | 4.05 | 7.20 | 8.03 | 8.45 | 28.04 | 23.15 | 9.24 | 15.64 | 7.02 | 5.38 | 15.57 | 10.82 |
| 95th-Percentile Queue Length [ft/ln] | 101.17 | 179.94 | 200.87 | 211.37 | 700.97 | 578.80 | 231.10 | 391.00 | 175.41 | 134.42 | 389.33 | 270.40 |

**Movement, Approach, & Intersection Results**

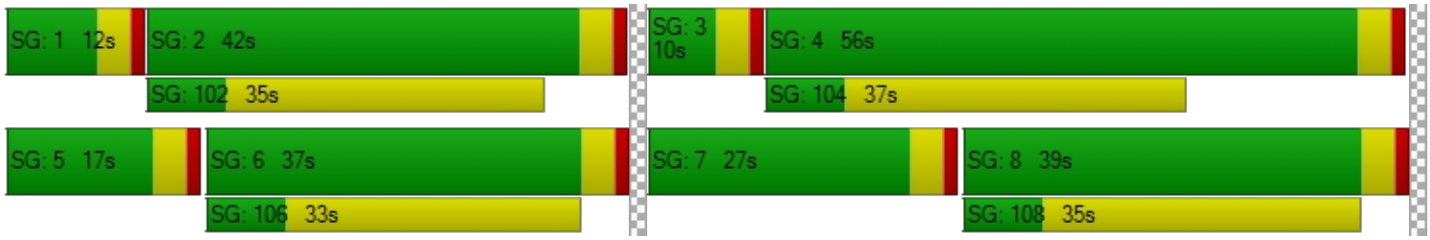
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 63.73 | 31.86 | 32.44 | 56.41 | 50.06 | 40.69 | 60.15 | 31.61 | 26.37 | 61.31 | 35.60 | 32.72 |
| Movement LOS | E | C | C | E | D | D | E | C | C | E | D | C |
| d_A, Approach Delay [s/veh] | 38.36 | | | 48.00 | | | 37.82 | | | 38.74 | | |
| Approach LOS | D | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 41.34 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.797 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.51 | 49.51 | 49.51 | 49.51 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.851 | 2.876 | 3.012 | 2.978 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 583 | 867 | 633 | 550 |
| d_b, Bicycle Delay [s] | 30.11 | 19.27 | 28.02 | 31.54 |
| l_b,int, Bicycle LOS Score for Intersection | 2.132 | 2.834 | 2.712 | 2.614 |
| Bicycle LOS | B | C | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 21.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.610 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 341 | 20 | 166 | 12 | 22 | 16 | 10 | 820 | 353 | 148 | 810 | 14 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 341 | 20 | 166 | 12 | 22 | 16 | 10 | 820 | 353 | 148 | 810 | 14 |
| Peak Hour Factor | 0.9600 | 0.9600 | 0.9600 | 0.7170 | 0.7170 | 0.7170 | 0.9350 | 0.9350 | 0.9350 | 0.9260 | 0.9260 | 0.9260 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 89 | 5 | 43 | 4 | 8 | 6 | 3 | 219 | 94 | 40 | 219 | 4 |
| Total Analysis Volume [veh/h] | 355 | 21 | 173 | 17 | 31 | 22 | 11 | 877 | 378 | 160 | 875 | 15 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 110 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 6 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 30 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 24 | 61 | 61 | 0 | 37 | 0 | 10 | 38 | 0 | 11 | 39 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 7 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 26 | 0 | 26 | 0 | 0 | 27 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | No | | No | | No | No | | No | No | |
| Maximum Recall | No | No | No | | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | No | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 14 | 23 | 34 | 5 | 5 | 2 | 68 | 68 | 7 | 73 | 73 |
| g / C, Green / Cycle | 0.12 | 0.21 | 0.31 | 0.05 | 0.05 | 0.02 | 0.62 | 0.62 | 0.06 | 0.67 | 0.67 |
| (v / s)_i Volume / Saturation Flow Rate | 0.10 | 0.01 | 0.09 | 0.01 | 0.03 | 0.01 | 0.35 | 0.31 | 0.05 | 0.23 | 0.23 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 |
| c, Capacity [veh/h] | 431 | 396 | 586 | 108 | 92 | 29 | 1176 | 1176 | 224 | 1267 | 1267 |
| d1, Uniform Delay [s] | 47.07 | 34.89 | 28.95 | 50.28 | 51.24 | 53.59 | 12.23 | 11.66 | 50.52 | 7.99 | 7.98 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 3.99 | 0.06 | 0.28 | 0.68 | 5.52 | 7.97 | 1.93 | 1.57 | 4.20 | 0.77 | 0.76 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.82 | 0.05 | 0.30 | 0.16 | 0.57 | 0.38 | 0.56 | 0.51 | 0.71 | 0.35 | 0.35 |
| d, Delay for Lane Group [s/veh] | 51.07 | 34.94 | 29.22 | 50.96 | 56.76 | 61.56 | 14.16 | 13.23 | 54.71 | 8.76 | 8.74 |
| Lane Group LOS | D | C | C | D | E | E | B | B | D | A | A |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 4.96 | 0.46 | 3.52 | 0.47 | 1.57 | 0.37 | 9.43 | 8.13 | 2.29 | 4.52 | 4.49 |
| 50th-Percentile Queue Length [ft/ln] | 124.09 | 11.47 | 88.05 | 11.75 | 39.25 | 9.13 | 235.84 | 203.33 | 57.19 | 113.01 | 112.13 |
| 95th-Percentile Queue Length [veh/ln] | 8.62 | 0.83 | 6.34 | 0.85 | 2.83 | 0.66 | 14.47 | 12.81 | 4.12 | 8.01 | 7.96 |
| 95th-Percentile Queue Length [ft/ln] | 215.44 | 20.65 | 158.48 | 21.15 | 70.65 | 16.43 | 361.76 | 320.25 | 102.94 | 200.18 | 198.96 |

**Movement, Approach, & Intersection Results**

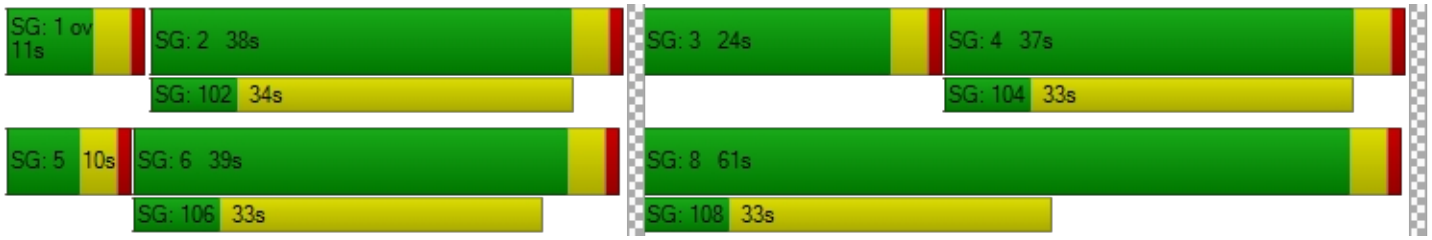
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 51.07 | 34.94 | 29.22 | 50.96 | 56.76 | 56.76 | 61.56 | 13.93 | 13.23 | 54.71 | 8.75 | 8.74 |
| Movement LOS | D | C | C | D | E | E | E | B | B | D | A | A |
| d_A, Approach Delay [s/veh] | 43.57 | | | 55.35 | | | 14.13 | | | 15.75 | | |
| Approach LOS | D | | | E | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 21.20 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.610 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 44.56 | 44.56 | 44.56 | 44.56 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.644 | 1.988 | 2.800 | 2.831 |
| Crosswalk LOS | B | A | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1036 | 600 | 618 | 636 |
| d_b, Bicycle Delay [s] | 12.78 | 26.96 | 26.27 | 25.58 |
| l_b,int, Bicycle LOS Score for Intersection | 2.465 | 1.675 | 2.604 | 2.426 |
| Bicycle LOS | B | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 20.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.263 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 22 | 306 | 115 | 72 | 284 | 24 | 38 | 11 | 60 | 83 | 4 | 59 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 22 | 306 | 115 | 72 | 284 | 24 | 38 | 11 | 60 | 83 | 4 | 59 |
| Peak Hour Factor | 0.9200 | 0.9200 | 0.9200 | 0.9030 | 0.9030 | 0.9030 | 0.6380 | 0.6380 | 0.6380 | 0.9310 | 0.9310 | 0.9310 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 6 | 83 | 31 | 20 | 79 | 7 | 15 | 4 | 24 | 22 | 1 | 16 |
| Total Analysis Volume [veh/h] | 24 | 333 | 125 | 80 | 315 | 27 | 60 | 17 | 94 | 89 | 4 | 63 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 26 | 0 | 10 | 26 | 0 | 0 | 54 | 0 | 0 | 54 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 12 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | L | C | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 3 | 65 | 65 | 5 | 68 | 68 | 7 | 7 | 7 | 7 |
| g / C, Green / Cycle | 0.03 | 0.73 | 0.73 | 0.06 | 0.75 | 0.75 | 0.08 | 0.08 | 0.08 | 0.08 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.12 | 0.12 | 0.04 | 0.09 | 0.09 | 0.03 | 0.06 | 0.05 | 0.04 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 56 | 1378 | 1378 | 106 | 1430 | 1430 | 135 | 157 | 93 | 157 |
| d1, Uniform Delay [s] | 42.82 | 3.89 | 3.85 | 41.74 | 3.03 | 3.03 | 39.18 | 40.23 | 39.85 | 39.26 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.01 | 0.27 | 0.25 | 10.43 | 0.17 | 0.17 | 2.28 | 5.68 | 32.81 | 1.82 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.43 | 0.17 | 0.16 | 0.76 | 0.12 | 0.12 | 0.44 | 0.71 | 0.95 | 0.43 |
|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 47.83 | 4.16 | 4.10 | 52.17 | 3.20 | 3.19 | 41.46 | 45.90 | 72.66 | 41.08 |
| Lane Group LOS | D | A | A | D | A | A | D | D | E | D |
| Critical Lane Group | No | Yes | No | Yes | No | No | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.60 | 1.18 | 1.09 | 2.04 | 0.69 | 0.68 | 1.33 | 2.61 | 2.73 | 1.47 |
| 50th-Percentile Queue Length [ft/ln] | 14.95 | 29.47 | 27.15 | 50.92 | 17.28 | 16.92 | 33.27 | 65.33 | 68.26 | 36.82 |
| 95th-Percentile Queue Length [veh/ln] | 1.08 | 2.12 | 1.95 | 3.67 | 1.24 | 1.22 | 2.40 | 4.70 | 4.91 | 2.65 |
| 95th-Percentile Queue Length [ft/ln] | 26.91 | 53.05 | 48.87 | 91.65 | 31.10 | 30.46 | 59.88 | 117.59 | 122.86 | 66.28 |

**Movement, Approach, & Intersection Results**

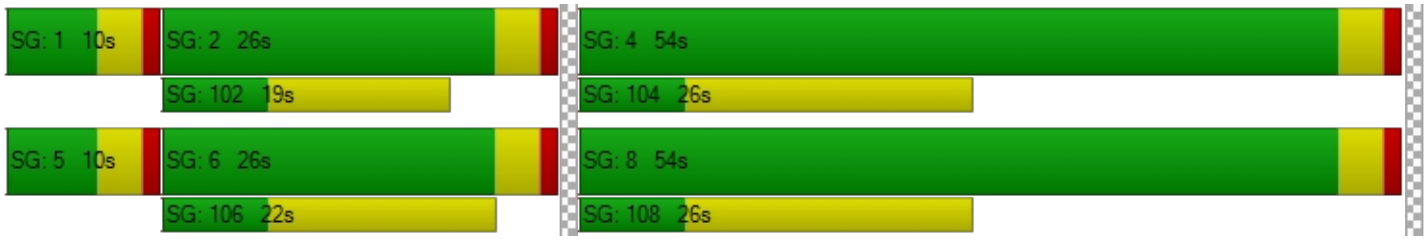
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 47.83 | 4.14 | 4.10 | 52.17 | 3.20 | 3.19 | 41.46 | 45.90 | 45.90 | 72.66 | 41.08 | 41.08 |
| Movement LOS | D | A | A | D | A | A | D | D | D | E | D | D |
| d_A, Approach Delay [s/veh] | 6.30 | | | 12.48 | | | 44.35 | | | 59.10 | | |
| Approach LOS | A | | | B | | | D | | | E | | |
| d_I, Intersection Delay [s/veh] | 20.40 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.263 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.617 | 2.556 | 2.013 | 2.063 |
| Crosswalk LOS | B | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 489 | 489 | 1111 | 1111 |
| d_b, Bicycle Delay [s] | 25.70 | 25.70 | 8.90 | 8.90 |
| l_b,int, Bicycle LOS Score for Intersection | 1.957 | 1.908 | 1.842 | 1.817 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 26.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.554 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 23 | 349 | 479 | 52 | 319 | 22 | 25 | 15 | 27 | 474 | 6 | 96 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 23 | 349 | 479 | 52 | 319 | 22 | 25 | 15 | 27 | 474 | 6 | 96 |
| Peak Hour Factor | 0.9560 | 0.9560 | 0.9560 | 0.8510 | 0.8510 | 0.8510 | 0.8970 | 0.8970 | 0.8970 | 0.8690 | 0.8690 | 0.8690 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 6 | 91 | 125 | 15 | 94 | 6 | 7 | 4 | 8 | 136 | 2 | 28 |
| Total Analysis Volume [veh/h] | 24 | 365 | 501 | 61 | 375 | 26 | 28 | 17 | 30 | 545 | 7 | 110 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 105 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 28 | 0 | 11 | 29 | 0 | 0 | 30 | 0 | 0 | 36 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 17 | 0 | 0 | 18 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | C | R | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 0.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 65 | 56 | 56 | 65 | 58 | 58 | 5 | 5 | 22 | 22 |
| g / C, Green / Cycle | 0.62 | 0.54 | 0.54 | 0.62 | 0.55 | 0.55 | 0.05 | 0.05 | 0.21 | 0.21 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.19 | 0.26 | 0.03 | 0.11 | 0.10 | 0.03 | 0.02 | 0.19 | 0.17 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 1116 | 1016 | 1016 | 908 | 1051 | 1051 | 92 | 97 | 385 | 406 |
| d1, Uniform Delay [s] | 7.66 | 14.08 | 15.45 | 7.82 | 11.73 | 11.70 | 48.50 | 48.05 | 39.94 | 39.18 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.11 | 0.11 | 0.17 | 0.13 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.01 | 0.99 | 1.71 | 0.14 | 0.41 | 0.40 | 3.95 | 1.77 | 9.47 | 4.45 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.02 | 0.36 | 0.49 | 0.07 | 0.19 | 0.19 | 0.49 | 0.31 | 0.87 | 0.80 |
|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 7.66 | 15.07 | 17.16 | 7.96 | 12.13 | 12.10 | 52.45 | 49.82 | 49.41 | 43.63 |
| Lane Group LOS | A | B | B | A | B | B | D | D | D | D |
| Critical Lane Group | No | No | Yes | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.20 | 5.10 | 7.74 | 0.55 | 2.41 | 2.37 | 1.25 | 0.80 | 9.32 | 8.38 |
| 50th-Percentile Queue Length [ft/ln] | 5.03 | 127.53 | 193.61 | 13.79 | 60.25 | 59.14 | 31.15 | 20.10 | 232.98 | 209.42 |
| 95th-Percentile Queue Length [veh/ln] | 0.36 | 8.81 | 12.31 | 0.99 | 4.34 | 4.26 | 2.24 | 1.45 | 14.33 | 13.12 |
| 95th-Percentile Queue Length [ft/ln] | 9.05 | 220.13 | 307.71 | 24.83 | 108.45 | 106.45 | 56.07 | 36.18 | 358.14 | 328.08 |

**Movement, Approach, & Intersection Results**

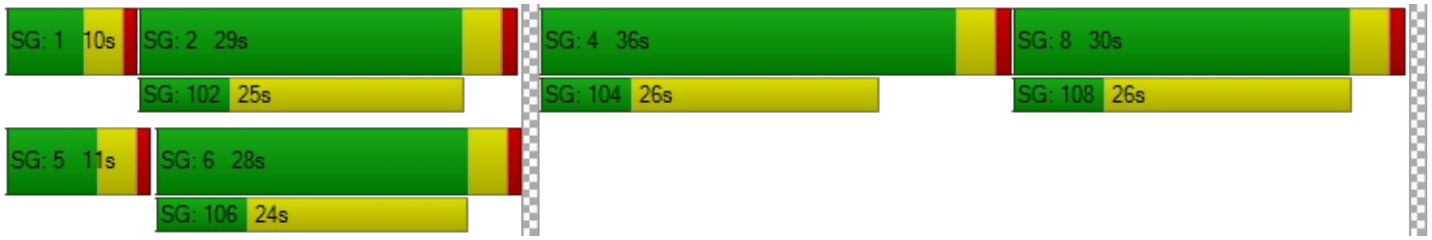
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 7.66 | 15.07 | 17.16 | 7.96 | 12.12 | 12.10 | 52.45 | 52.45 | 49.82 | 47.19 | 43.63 | 43.63 |
| Movement LOS | A | B | B | A | B | B | D | D | D | D | D | D |
| d_A, Approach Delay [s/veh] | 16.04 | | | 11.57 | | | 51.40 | | | 46.57 | | |
| Approach LOS | B | | | B | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 26.00 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.554 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 42.09 | 42.09 | 42.09 | 42.09 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.666 | 2.495 | 2.010 | 2.399 |
| Crosswalk LOS | B | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 457 | 476 | 495 | 609 |
| d_b, Bicycle Delay [s] | 31.26 | 30.49 | 29.73 | 25.39 |
| l_b,int, Bicycle LOS Score for Intersection | 2.294 | 1.941 | 1.683 | 2.652 |
| Bicycle LOS | B | A | A | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 33.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.881 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 175 | 32 | 94 | 85 | 28 | 610 | 709 | 402 | 30 | 89 | 641 | 45 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 175 | 32 | 94 | 85 | 28 | 610 | 709 | 402 | 30 | 89 | 641 | 45 |
| Peak Hour Factor | 0.8300 | 0.8300 | 0.8300 | 0.8970 | 0.8970 | 0.8970 | 0.9440 | 0.9440 | 0.9440 | 0.8860 | 0.8860 | 0.8860 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 53 | 10 | 28 | 24 | 8 | 170 | 188 | 106 | 8 | 25 | 181 | 13 |
| Total Analysis Volume [veh/h] | 211 | 39 | 113 | 95 | 31 | 680 | 751 | 426 | 32 | 100 | 723 | 51 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 6 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 30 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 37 | 0 | 0 | 14 | 14 | 37 | 31 | 0 | 38 | 32 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 21 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | No | No | No | | No | No | |
| Maximum Recall | | No | | | No | No | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | No | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | C | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 13 | 13 | 13 | 10 | 10 | 63 | 32 | 73 | 73 | 8 | 49 | 49 |
| g / C, Green / Cycle | 0.11 | 0.11 | 0.11 | 0.08 | 0.08 | 0.52 | 0.27 | 0.61 | 0.61 | 0.07 | 0.41 | 0.41 |
| (v / s)_i Volume / Saturation Flow Rate | 0.05 | 0.09 | 0.06 | 0.05 | 0.02 | 0.36 | 0.21 | 0.12 | 0.12 | 0.06 | 0.21 | 0.20 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 1900 | 1900 |
| c, Capacity [veh/h] | 222 | 243 | 201 | 151 | 159 | 995 | 936 | 1152 | 1152 | 127 | 778 | 778 |
| d1, Uniform Delay [s] | 50.61 | 52.53 | 51.01 | 53.20 | 51.23 | 21.20 | 41.00 | 10.58 | 10.55 | 54.89 | 26.35 | 26.19 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.28 | 2.82 | 2.44 | 4.31 | 0.59 | 3.80 | 1.65 | 0.39 | 0.38 | 10.18 | 2.32 | 2.21 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.42 | 0.64 | 0.56 | 0.63 | 0.20 | 0.68 | 0.80 | 0.20 | 0.20 | 0.79 | 0.50 | 0.49 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 51.90 | 55.34 | 53.45 | 57.51 | 51.82 | 25.00 | 42.65 | 10.98 | 10.93 | 65.07 | 28.66 | 28.41 |
| Lane Group LOS | D | E | D | E | D | C | D | B | B | E | C | C |
| Critical Lane Group | No | Yes | No | No | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 2.74 | 4.79 | 3.37 | 2.96 | 0.90 | 14.81 | 10.52 | 2.83 | 2.75 | 3.34 | 8.78 | 8.53 |
| 50th-Percentile Queue Length [ft/ln] | 68.62 | 119.71 | 84.22 | 73.88 | 22.45 | 370.26 | 262.91 | 70.70 | 68.85 | 83.38 | 219.58 | 213.13 |
| 95th-Percentile Queue Length [veh/ln] | 4.94 | 8.38 | 6.06 | 5.32 | 1.62 | 21.12 | 15.83 | 5.09 | 4.96 | 6.00 | 13.64 | 13.31 |
| 95th-Percentile Queue Length [ft/ln] | 123.51 | 209.43 | 151.60 | 132.99 | 40.42 | 528.05 | 395.87 | 127.26 | 123.93 | 150.09 | 341.09 | 332.84 |

**Movement, Approach, & Intersection Results**

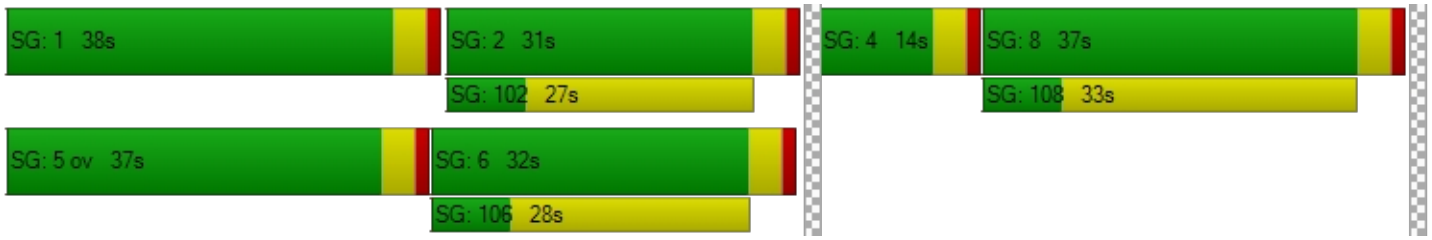
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 53.73 | 55.34 | 53.45 | 57.51 | 51.82 | 25.00 | 42.65 | 10.96 | 10.93 | 65.07 | 28.55 | 28.41 |
| Movement LOS | D | E | D | E | D | C | D | B | B | E | C | C |
| d_A, Approach Delay [s/veh] | 53.86 | | | 29.87 | | | 30.64 | | | 32.72 | | |
| Approach LOS | D | | | C | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 33.60 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.881 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.51 | 49.51 | 0.00 | 49.51 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.416 | 2.635 | 0.000 | 2.608 |
| Crosswalk LOS | B | B | F | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 550 | 167 | 450 | 467 |
| d_b, Bicycle Delay [s] | 31.54 | 50.42 | 36.04 | 35.27 |
| l_b,int, Bicycle LOS Score for Intersection | 2.159 | 2.225 | 2.557 | 2.281 |
| Bicycle LOS | B | B | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 39.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.759 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 357 | 800 | 192 | 236 | 827 | 303 | 353 | 1223 | 283 | 350 | 1331 | 225 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 357 | 800 | 192 | 236 | 827 | 303 | 353 | 1223 | 283 | 350 | 1331 | 225 |
| Peak Hour Factor | 0.9070 | 0.9070 | 0.9070 | 0.9640 | 0.9640 | 0.9640 | 0.9710 | 0.9710 | 0.9710 | 0.9600 | 0.9600 | 0.9600 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 98 | 221 | 53 | 61 | 214 | 79 | 91 | 315 | 73 | 91 | 347 | 59 |
| Total Analysis Volume [veh/h] | 394 | 882 | 212 | 245 | 858 | 314 | 364 | 1260 | 291 | 365 | 1386 | 234 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 20 | 45 | 0 | 14 | 39 | 0 | 19 | 42 | 0 | 19 | 42 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 31 | 0 | 0 | 28 | 0 | 0 | 31 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 15 | 30 | 30 | 10 | 24 | 24 | 14 | 50 | 50 | 14 | 50 | 50 |
| g / C, Green / Cycle | 0.13 | 0.25 | 0.25 | 0.08 | 0.20 | 0.20 | 0.12 | 0.41 | 0.41 | 0.12 | 0.42 | 0.42 |
| (v / s)_i Volume / Saturation Flow Rate | 0.11 | 0.15 | 0.11 | 0.07 | 0.15 | 0.17 | 0.10 | 0.28 | 0.27 | 0.10 | 0.24 | 0.12 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 452 | 1410 | 470 | 296 | 1157 | 386 | 422 | 1573 | 787 | 423 | 2361 | 787 |
| d1, Uniform Delay [s] | 51.34 | 40.24 | 38.29 | 54.12 | 44.91 | 45.71 | 51.84 | 28.47 | 28.07 | 51.83 | 27.23 | 23.50 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.13 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.39 | 0.46 | 0.68 | 5.88 | 0.96 | 5.10 | 5.33 | 2.25 | 3.98 | 5.34 | 1.08 | 0.96 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.87 | 0.63 | 0.45 | 0.83 | 0.74 | 0.81 | 0.86 | 0.67 | 0.64 | 0.86 | 0.59 | 0.30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 56.73 | 40.70 | 38.96 | 60.00 | 45.87 | 50.81 | 57.17 | 30.72 | 32.04 | 57.17 | 28.31 | 24.47 |
| Lane Group LOS | E | D | D | E | D | D | E | C | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 6.15 | 7.79 | 5.39 | 3.89 | 8.08 | 9.46 | 5.69 | 12.51 | 12.27 | 5.70 | 10.38 | 4.65 |
| 50th-Percentile Queue Length [ft/ln] | 153.73 | 194.63 | 134.71 | 97.15 | 202.04 | 236.54 | 142.17 | 312.80 | 306.68 | 142.58 | 259.55 | 116.17 |
| 95th-Percentile Queue Length [veh/ln] | 10.22 | 12.36 | 9.20 | 6.99 | 12.74 | 14.51 | 9.60 | 18.31 | 18.01 | 9.62 | 15.67 | 8.18 |
| 95th-Percentile Queue Length [ft/ln] | 255.40 | 309.03 | 229.89 | 174.86 | 318.60 | 362.66 | 239.95 | 457.83 | 450.28 | 240.49 | 391.65 | 204.55 |

**Movement, Approach, & Intersection Results**

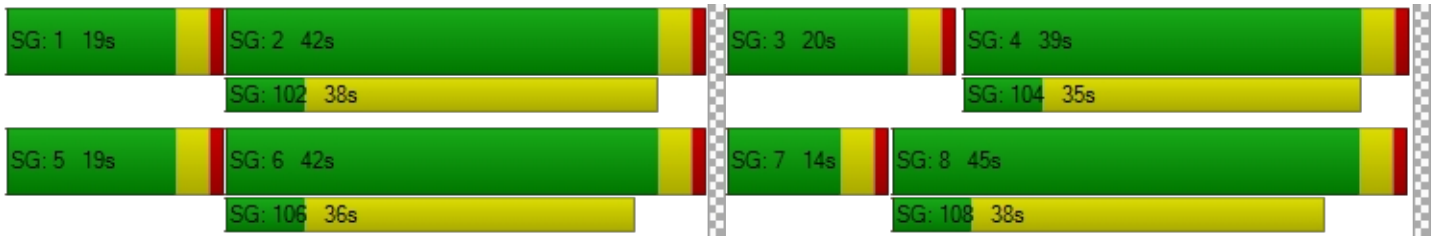
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 56.73 | 40.70 | 38.96 | 60.00 | 45.87 | 50.81 | 57.17 | 30.94 | 32.04 | 57.17 | 28.31 | 24.47 |
| Movement LOS | E | D | D | E | D | D | E | C | C | E | C | C |
| d_A, Approach Delay [s/veh] | 44.70 | | | 49.41 | | | 36.10 | | | 33.16 | | |
| Approach LOS | D | | | D | | | D | | | C | | |
| d_I, Intersection Delay [s/veh] | 39.89 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.759 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.188 | 3.177 | 3.228 | 3.264 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 683 | 583 | 633 | 633 |
| d_b, Bicycle Delay [s] | 26.03 | 30.13 | 28.04 | 28.04 |
| l_b,int, Bicycle LOS Score for Intersection | 2.378 | 2.339 | 2.613 | 2.651 |
| Bicycle LOS | B | B | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 14.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.518 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 27 | 31 | 99 | 166 | 44 | 128 | 82 | 1402 | 37 | 84 | 1474 | 195 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 27 | 31 | 99 | 166 | 44 | 128 | 82 | 1402 | 37 | 84 | 1474 | 195 |
| Peak Hour Factor | 0.8200 | 0.8200 | 0.8200 | 0.7710 | 0.7710 | 0.7710 | 0.9890 | 0.9890 | 0.9890 | 0.9120 | 0.9120 | 0.9120 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 8 | 9 | 30 | 54 | 14 | 42 | 21 | 354 | 9 | 23 | 404 | 53 |
| Total Analysis Volume [veh/h] | 33 | 38 | 121 | 215 | 57 | 166 | 83 | 1418 | 37 | 92 | 1616 | 214 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 40 | 0 | 0 | 40 | 0 | 10 | 37 | 0 | 13 | 40 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 23 | 0 | 0 | 17 | 0 | 0 | 23 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 13 | 13 | 13 | 13 | 13 | 13 | 5 | 59 | 59 | 6 | 59 | 59 |
| g / C, Green / Cycle | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.06 | 0.65 | 0.65 | 0.07 | 0.66 | 0.66 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.02 | 0.06 | 0.12 | 0.02 | 0.09 | 0.05 | 0.25 | 0.26 | 0.05 | 0.28 | 0.11 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 291 | 282 | 282 | 283 | 563 | 282 | 110 | 2474 | 1237 | 121 | 3747 | 1249 |
| d1, Uniform Delay [s] | 33.29 | 33.35 | 34.91 | 37.12 | 33.18 | 35.81 | 41.62 | 7.33 | 7.42 | 41.29 | 7.38 | 5.96 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.17 | 0.22 | 1.04 | 4.19 | 0.08 | 1.96 | 9.93 | 0.46 | 0.97 | 9.25 | 0.36 | 0.30 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.11 | 0.13 | 0.43 | 0.76 | 0.10 | 0.59 | 0.75 | 0.39 | 0.40 | 0.76 | 0.43 | 0.17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 33.46 | 33.56 | 35.94 | 41.31 | 33.26 | 37.77 | 51.56 | 7.79 | 8.40 | 50.53 | 7.74 | 6.26 |
| Lane Group LOS | C | C | D | D | C | D | D | A | A | D | A | A |
| Critical Lane Group | No | No | No | Yes | No | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.63 | 0.73 | 2.46 | 4.83 | 0.54 | 3.51 | 2.10 | 3.88 | 4.24 | 2.30 | 4.37 | 1.47 |
| 50th-Percentile Queue Length [ft/ln] | 15.84 | 18.29 | 61.58 | 120.75 | 13.49 | 87.66 | 52.46 | 96.98 | 106.03 | 57.40 | 109.35 | 36.65 |
| 95th-Percentile Queue Length [veh/ln] | 1.14 | 1.32 | 4.43 | 8.43 | 0.97 | 6.31 | 3.78 | 6.98 | 7.62 | 4.13 | 7.80 | 2.64 |
| 95th-Percentile Queue Length [ft/ln] | 28.51 | 32.92 | 110.84 | 210.86 | 24.27 | 157.78 | 94.42 | 174.56 | 190.46 | 103.32 | 195.09 | 65.96 |

**Movement, Approach, & Intersection Results**

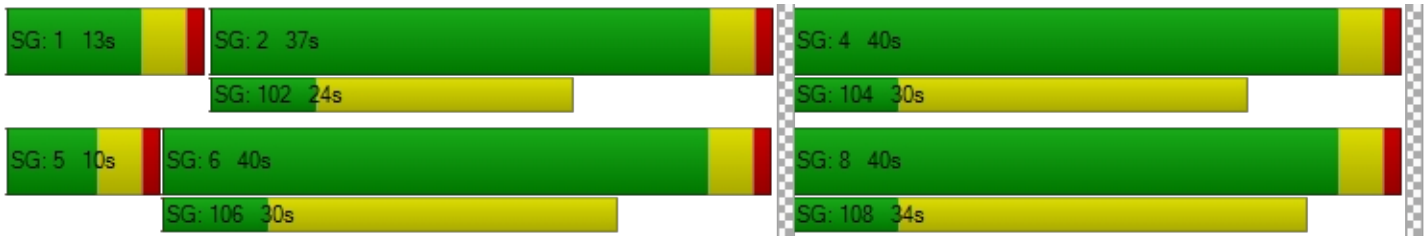
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 33.46 | 33.56 | 35.94 | 41.31 | 33.26 | 37.77 | 51.56 | 7.99 | 8.40 | 50.53 | 7.74 | 6.26 |
| Movement LOS | C | C | D | D | C | D | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 35.04 | | | 38.92 | | | 10.35 | | | 9.63 | | |
| Approach LOS | D | | | D | | | B | | | A | | |
| d_I, Intersection Delay [s/veh] | 14.23 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.518 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.70 | 34.70 | 34.70 | 34.70 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.373 | 2.450 | 3.107 | 3.479 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 800 | 800 | 733 | 800 |
| d_b, Bicycle Delay [s] | 16.22 | 16.22 | 18.07 | 16.22 |
| l_b,int, Bicycle LOS Score for Intersection | 1.876 | 1.921 | 2.406 | 2.617 |
| Bicycle LOS | A | A | B | B |

## Sequence

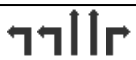
| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 49.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.930 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 437 | 574 | 294 | 467 | 933 | 253 | 274 | 1454 | 288 | 385 | 1433 | 414 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 437 | 574 | 294 | 467 | 933 | 253 | 274 | 1454 | 288 | 385 | 1433 | 414 |
| Peak Hour Factor | 0.9240 | 0.9240 | 0.9240 | 0.9170 | 0.9170 | 0.9170 | 0.9130 | 0.9130 | 0.9130 | 0.8900 | 0.8900 | 0.8900 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 118 | 155 | 80 | 127 | 254 | 69 | 75 | 398 | 79 | 108 | 403 | 116 |
| Total Analysis Volume [veh/h] | 473 | 621 | 318 | 509 | 1017 | 276 | 300 | 1593 | 315 | 433 | 1610 | 465 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 21 | 41 | 0 | 20 | 40 | 0 | 15 | 41 | 0 | 18 | 44 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 17 | 36 | 36 | 16 | 35 | 35 | 11 | 38 | 38 | 14 | 41 | 41 |
| g / C, Green / Cycle | 0.14 | 0.30 | 0.30 | 0.13 | 0.29 | 0.29 | 0.09 | 0.32 | 0.32 | 0.12 | 0.35 | 0.35 |
| (v / s)_i Volume / Saturation Flow Rate | 0.14 | 0.11 | 0.17 | 0.15 | 0.27 | 0.15 | 0.09 | 0.28 | 0.17 | 0.12 | 0.28 | 0.24 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 497 | 1682 | 561 | 468 | 1090 | 545 | 323 | 1829 | 610 | 410 | 1971 | 657 |
| d1, Uniform Delay [s] | 51.10 | 33.48 | 35.83 | 52.00 | 41.70 | 35.73 | 54.11 | 38.43 | 33.19 | 53.00 | 35.81 | 34.02 |
| k, delay calibration | 0.11 | 0.11 | 0.12 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 10.41 | 0.14 | 1.01 | 47.90 | 4.36 | 0.73 | 11.60 | 6.02 | 3.11 | 37.38 | 3.89 | 6.33 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.95 | 0.37 | 0.57 | 1.09 | 0.93 | 0.51 | 0.93 | 0.87 | 0.52 | 1.06 | 0.82 | 0.71 |
| d, Delay for Lane Group [s/veh] | 61.51 | 33.62 | 36.84 | 99.90 | 46.06 | 36.46 | 65.71 | 44.45 | 36.30 | 90.38 | 39.71 | 40.36 |
| Lane Group LOS | E | C | D | F | D | D | E | D | D | F | D | D |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 7.75 | 4.81 | 8.02 | 10.14 | 15.15 | 6.85 | 5.01 | 15.59 | 7.99 | 8.29 | 14.88 | 12.82 |
| 50th-Percentile Queue Length [ft/ln] | 193.86 | 120.14 | 200.60 | 253.46 | 378.82 | 171.26 | 125.35 | 389.78 | 199.82 | 207.36 | 371.90 | 320.42 |
| 95th-Percentile Queue Length [veh/ln] | 12.32 | 8.40 | 12.67 | 15.93 | 21.54 | 11.14 | 8.69 | 22.07 | 12.63 | 13.31 | 21.20 | 18.69 |
| 95th-Percentile Queue Length [ft/ln] | 308.03 | 210.02 | 316.74 | 398.16 | 538.42 | 278.58 | 217.16 | 551.67 | 315.74 | 332.78 | 530.04 | 467.21 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 61.51 | 33.62 | 36.84 | 99.90 | 46.06 | 36.46 | 65.71 | 44.45 | 36.30 | 90.38 | 39.71 | 40.36 |
| Movement LOS | E | C | D | F | D | D | E | D | D | F | D | D |
| d_A, Approach Delay [s/veh] | 43.69 | | | 59.80 | | | 46.18 | | | 48.57 | | |
| Approach LOS | D | | | E | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 49.59 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.930 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 49.52 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.126 | 3.128 | 3.358 | 3.397 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 617 | 600 | 617 | 666 |
| d_b, Bicycle Delay [s] | 28.72 | 29.41 | 28.72 | 26.68 |
| l_b,int, Bicycle LOS Score for Intersection | 2.336 | 3.046 | 2.774 | 2.939 |
| Bicycle LOS | B | C | C | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 52.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.950 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 102 | 47 | 199 | 446 | 86 | 352 | 344 | 1626 | 65 | 142 | 1880 | 496 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 102 | 47 | 199 | 446 | 86 | 352 | 344 | 1626 | 65 | 142 | 1880 | 496 |
| Peak Hour Factor | 0.8250 | 0.8250 | 0.8250 | 0.9010 | 0.9010 | 0.9010 | 0.9400 | 0.9400 | 0.9400 | 0.9820 | 0.9820 | 0.9820 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 31 | 14 | 60 | 124 | 24 | 98 | 91 | 432 | 17 | 36 | 479 | 126 |
| Total Analysis Volume [veh/h] | 124 | 57 | 241 | 495 | 95 | 391 | 366 | 1730 | 69 | 145 | 1914 | 505 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 19 | 0 | 0 | 40 | 0 | 17 | 47 | 0 | 14 | 44 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 28 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 17 | 17 | 17 | 33 | 33 | 13 | 44 | 44 | 10 | 41 | 41 |
| g / C, Green / Cycle | 0.14 | 0.14 | 0.14 | 0.28 | 0.28 | 0.11 | 0.36 | 0.36 | 0.08 | 0.34 | 0.34 |
| (v / s)_i Volume / Saturation Flow Rate | 0.07 | 0.03 | 0.13 | 0.14 | 0.26 | 0.10 | 0.31 | 0.32 | 0.08 | 0.34 | 0.27 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 3500 | 1900 | 3500 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 257 | 257 | 271 | 970 | 527 | 381 | 1380 | 690 | 151 | 1928 | 643 |
| d1, Uniform Delay [s] | 47.40 | 45.58 | 50.55 | 36.53 | 42.14 | 53.24 | 35.40 | 35.96 | 54.79 | 39.59 | 35.81 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.35 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.41 | 0.43 | 9.71 | 0.42 | 18.60 | 13.98 | 7.16 | 15.88 | 25.48 | 18.90 | 9.37 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.48 | 0.22 | 0.89 | 0.51 | 0.92 | 0.96 | 0.86 | 0.89 | 0.96 | 0.99 | 0.79 |
| d, Delay for Lane Group [s/veh] | 48.81 | 46.01 | 60.26 | 36.95 | 60.74 | 67.22 | 42.56 | 51.85 | 80.27 | 58.49 | 45.19 |
| Lane Group LOS | D | D | E | D | E | E | D | D | F | E | D |
| Critical Lane Group | No | No | Yes | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 3.52 | 1.54 | 7.83 | 6.17 | 16.58 | 6.22 | 17.17 | 19.65 | 5.43 | 21.78 | 14.86 |
| 50th-Percentile Queue Length [ft/ln] | 88.11 | 38.61 | 195.66 | 154.33 | 414.46 | 155.61 | 429.26 | 491.25 | 135.82 | 544.59 | 371.40 |
| 95th-Percentile Queue Length [veh/ln] | 6.34 | 2.78 | 12.41 | 10.25 | 23.26 | 10.32 | 23.97 | 26.92 | 9.26 | 29.44 | 21.18 |
| 95th-Percentile Queue Length [ft/ln] | 158.60 | 69.49 | 310.36 | 256.20 | 581.39 | 257.89 | 599.15 | 673.00 | 231.39 | 735.95 | 529.42 |

**Movement, Approach, & Intersection Results**

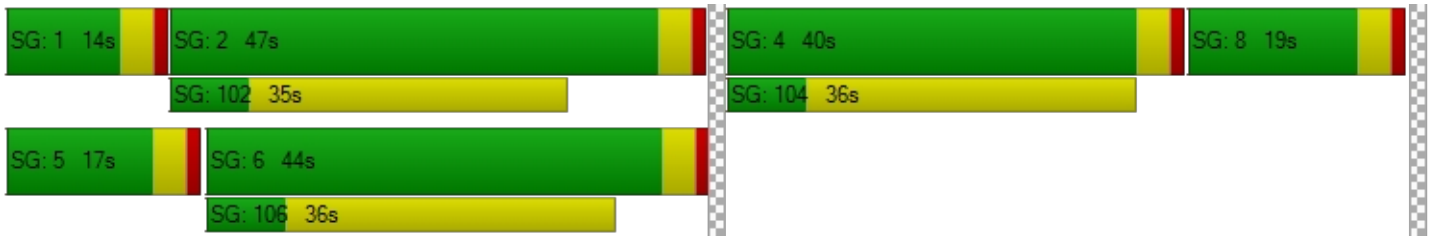
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 48.81 | 46.01 | 60.26 | 36.95 | 60.74 | 60.74 | 67.22 | 45.48 | 51.85 | 80.27 | 58.49 | 45.19 |
| Movement LOS | D | D | E | D | E | E | E | D | D | F | E | D |
| d_A, Approach Delay [s/veh] | 54.97 | | | 48.73 | | | 49.36 | | | 57.10 | | |
| Approach LOS | D | | | D | | | D | | | E | | |
| d_I, Intersection Delay [s/veh] | 52.88 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.950 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.323 | 2.686 | 3.299 | 0.000 |
| Crosswalk LOS | B | B | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 250 | 600 | 716 | 666 |
| d_b, Bicycle Delay [s] | 45.95 | 29.41 | 24.72 | 26.68 |
| l_b,int, Bicycle LOS Score for Intersection | 1.908 | 3.178 | 2.750 | 2.970 |
| Bicycle LOS | A | C | C | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 165.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | F |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.394 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 331 | 564 | 607 | 655 | 443 | 186 | 139 | 1695 | 233 | 684 | 2092 | 991 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 331 | 564 | 607 | 655 | 443 | 186 | 139 | 1695 | 233 | 684 | 2092 | 991 |
| Peak Hour Factor | 0.9800 | 0.9800 | 0.9800 | 0.8330 | 0.8330 | 0.8330 | 0.9250 | 0.9250 | 0.9250 | 0.9230 | 0.9230 | 0.9230 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 84 | 144 | 155 | 197 | 133 | 56 | 38 | 458 | 63 | 185 | 567 | 268 |
| Total Analysis Volume [veh/h] | 338 | 576 | 619 | 786 | 532 | 223 | 150 | 1832 | 252 | 741 | 2267 | 1074 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 30 | 41 | 0 | 28 | 39 | 0 | 10 | 34 | 0 | 17 | 41 | 41 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 23 | 0 | 0 | 23 | 23 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 14 | 37 | 37 | 24 | 47 | 47 | 6 | 30 | 30 | 13 | 37 | 65 |
| g / C, Green / Cycle | 0.12 | 0.31 | 0.31 | 0.20 | 0.39 | 0.39 | 0.05 | 0.25 | 0.25 | 0.11 | 0.31 | 0.54 |
| (v / s)_i Volume / Saturation Flow Rate | 0.10 | 0.15 | 0.33 | 0.39 | 0.21 | 0.19 | 0.04 | 0.27 | 0.28 | 0.21 | 0.40 | 0.57 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 2000 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 412 | 1167 | 583 | 400 | 740 | 740 | 176 | 1431 | 477 | 380 | 1762 | 1031 |
| d1, Uniform Delay [s] | 51.70 | 33.96 | 41.59 | 48.01 | 28.17 | 27.70 | 56.54 | 44.95 | 44.95 | 53.50 | 41.46 | 27.45 |
| k, delay calibration | 0.11 | 0.11 | 0.50 | 0.29 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.07 | 0.32 | 54.45 | 439.37 | 0.61 | 0.51 | 10.83 | 51.47 | 73.60 | 429.51 | 133.29 | 39.54 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.82 | 0.49 | 1.06 | 1.96 | 0.53 | 0.49 | 0.85 | 1.09 | 1.11 | 1.95 | 1.29 | 1.04 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 55.77 | 34.29 | 96.03 | 487.38 | 28.78 | 28.21 | 67.37 | 96.43 | 118.55 | 483.01 | 174.75 | 66.99 |
| Lane Group LOS | E | C | F | F | C | C | E | F | F | F | F | F |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 5.20 | 6.91 | 25.83 | 30.36 | 8.70 | 7.98 | 2.52 | 20.89 | 23.82 | 28.39 | 38.89 | 39.22 |
| 50th-Percentile Queue Length [ft/ln] | 129.90 | 172.71 | 645.79 | 759.07 | 217.58 | 199.44 | 63.01 | 522.23 | 595.51 | 709.79 | 972.31 | 980.45 |
| 95th-Percentile Queue Length [veh/ln] | 8.93 | 11.22 | 35.52 | 49.71 | 13.54 | 12.61 | 4.54 | 29.82 | 33.78 | 44.97 | 56.89 | 51.23 |
| 95th-Percentile Queue Length [ft/ln] | 223.36 | 280.47 | 888.08 | 1242.73 | 338.53 | 315.24 | 113.41 | 745.60 | 844.62 | 1124.17 | 1422.36 | 1280.67 |

**Movement, Approach, & Intersection Results**

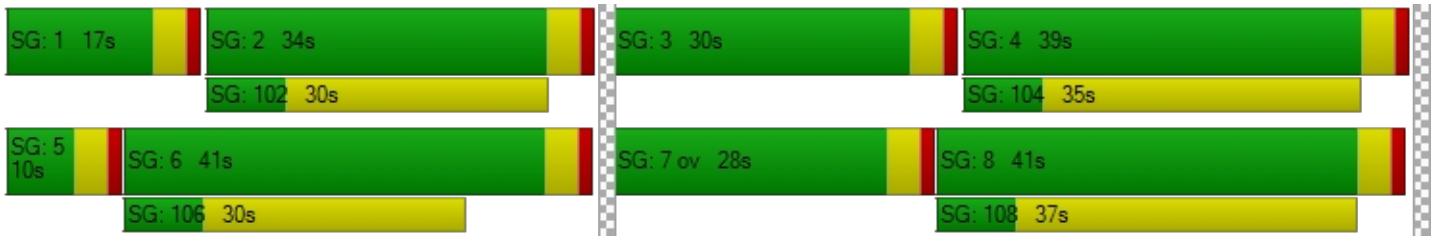
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 55.77 | 34.29 | 96.03 | 487.38 | 28.63 | 28.21 | 67.37 | 99.76 | 118.55 | 483.01 | 174.75 | 66.99 |
| Movement LOS | E | C | F | F | C | C | E | F | F | F | F | F |
| d_A, Approach Delay [s/veh] | 63.96 | | | 262.56 | | | 99.70 | | | 202.35 | | |
| Approach LOS | E | | | F | | | F | | | F | | |
| d_I, Intersection Delay [s/veh] | 165.22 | | | | | | | | | | | |
| Intersection LOS | F | | | | | | | | | | | |
| Intersection V/C | 1.394 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.51 | 49.51 | 49.51 | 49.51 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.034 | 3.010 | 3.411 | 3.694 |
| Crosswalk LOS | C | C | C | D |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 617 | 583 | 500 | 617 |
| d_b, Bicycle Delay [s] | 28.71 | 30.11 | 33.76 | 28.71 |
| l_b,int, Bicycle LOS Score for Intersection | 2.824 | 2.831 | 2.481 | 3.805 |
| Bicycle LOS | C | C | B | D |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 21.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.856 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 555 | 0 | 782 | 0 | 2051 | 1213 | 0 | 2838 | 349 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 555 | 0 | 782 | 0 | 2051 | 1213 | 0 | 2838 | 349 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 0.9240 | 1.0000 | 0.9240 | 1.0000 | 0.9460 | 0.9460 | 1.0000 | 0.9730 | 0.9730 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 150 | 0 | 212 | 0 | 542 | 321 | 0 | 729 | 90 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 601 | 0 | 846 | 0 | 2168 | 1282 | 0 | 2917 | 359 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_di, Inbound Pedestrian Volume crossing m | | 0 | | | 0 | | | 0 | | | 0 | |
| v_co, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ci, Inbound Pedestrian Volume crossing mi | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ab, Corner Pedestrian Volume [ped/h] | | 0 | | | 0 | | | 0 | | | 0 | |
| Bicycle Volume [bicycles/h] | | 0 | | | 0 | | | 0 | | | 0 | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 8.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 55 | 0 | 0 | 0 | 45 | 0 | 0 | 45 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | | No | |
| Maximum Recall | | | | No | | | | No | | | No | |
| Pedestrian Recall | | | | No | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | C | R | C | C |
|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 32 | 32 | 32 | 60 | 60 |
| g / C, Green / Cycle | | 0.32 | 0.32 | 0.32 | 0.60 | 0.60 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.28 | 0.28 | 0.25 | 0.38 | 0.51 |
| s, saturation flow rate [veh/h] | | 1750 | 1750 | 1900 | 5700 | 5700 |
| c, Capacity [veh/h] | | 564 | 564 | 612 | 3408 | 3408 |
| d1, Uniform Delay [s] | | 31.69 | 31.69 | 30.76 | 13.03 | 16.54 |
| k, delay calibration | | 0.12 | 0.12 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 4.38 | 4.38 | 2.31 | 0.92 | 3.00 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.86 | 0.86 | 0.79 | 0.64 | 0.86 |
| d, Delay for Lane Group [s/veh] | | 36.07 | 36.07 | 33.08 | 13.95 | 19.54 |
| Lane Group LOS | | D | D | C | B | B |
| Critical Lane Group | | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | | 11.29 | 11.29 | 10.69 | 9.96 | 17.45 |
| 50th-Percentile Queue Length [ft/ln] | | 282.25 | 282.25 | 267.20 | 248.90 | 436.32 |
| 95th-Percentile Queue Length [veh/ln] | | 16.80 | 16.80 | 16.05 | 15.13 | 24.30 |
| 95th-Percentile Queue Length [ft/ln] | | 420.01 | 420.01 | 401.24 | 378.27 | 607.60 |

**Movement, Approach, & Intersection Results**

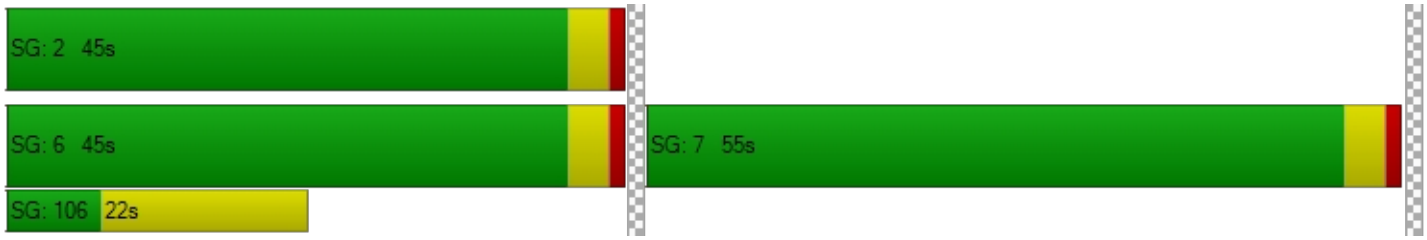
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 36.07 | 0.00 | 34.36 | 0.00 | 13.95 | 0.00 | 0.00 | 19.54 | 0.00 |
| Movement LOS | | | | D | | C | | B | | | B | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 35.07 | | | 13.95 | | | 19.54 | | |
| Approach LOS | A | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 21.12 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.856 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 0.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 0.00 | 39.57 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 0.000 | 2.489 | 0.000 | 0.000 |
| Crosswalk LOS | F | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 1021 | 821 | 821 |
| d_b, Bicycle Delay [s] | 49.97 | 11.98 | 17.38 | 17.38 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 3.947 | 2.752 | 3.164 |
| Bicycle LOS | D | D | C | C |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 34.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.859 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1506 | 73 | 606 | 0 | 0 | 258 | 237 | 2014 | 603 | 0 | 2051 | 36 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1506 | 73 | 606 | 0 | 0 | 258 | 237 | 2014 | 603 | 0 | 2051 | 36 |
| Peak Hour Factor | 0.9320 | 0.9320 | 0.9320 | 1.0000 | 1.0000 | 0.8040 | 0.9340 | 0.9340 | 0.9340 | 1.0000 | 0.9510 | 0.9510 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 404 | 20 | 163 | 0 | 0 | 80 | 63 | 539 | 161 | 0 | 539 | 9 |
| Total Analysis Volume [veh/h] | 1616 | 78 | 650 | 0 | 0 | 321 | 254 | 2156 | 646 | 0 | 2157 | 38 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 115 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 0 | 6 | 6 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 51 | 0 | 0 | 0 | 23 | 23 | 64 | 0 | 0 | 41 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | | No | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | | No | No | No | | | No | |
| Maximum Recall | | No | | | | No | No | No | | | No | |
| Pedestrian Recall | | No | | | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 44 | 44 | 44 | 18 | 18 | 63 | 41 | 41 |
| g / C, Green / Cycle | 0.38 | 0.38 | 0.38 | 0.16 | 0.16 | 0.55 | 0.36 | 0.36 |
| (v / s)_i Volume / Saturation Flow Rate | 0.33 | 0.34 | 0.31 | 0.08 | 0.14 | 0.38 | 0.29 | 0.29 |
| s, saturation flow rate [veh/h] | 3500 | 1750 | 1900 | 3800 | 1800 | 5700 | 5700 | 1900 |
| c, Capacity [veh/h] | 1332 | 666 | 723 | 599 | 284 | 3134 | 2037 | 679 |
| d1, Uniform Delay [s] | 32.91 | 33.40 | 32.10 | 44.54 | 47.48 | 18.73 | 33.38 | 33.38 |
| k, delay calibration | 0.11 | 0.34 | 0.29 | 0.11 | 0.11 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.84 | 12.24 | 6.23 | 0.75 | 10.11 | 1.26 | 3.58 | 10.01 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.87 | 0.89 | 0.82 | 0.54 | 0.90 | 0.69 | 0.81 | 0.81 |
| d, Delay for Lane Group [s/veh] | 34.75 | 45.64 | 38.33 | 45.29 | 57.59 | 19.99 | 36.95 | 43.39 |
| Lane Group LOS | C | D | D | D | E | B | D | D |
| Critical Lane Group | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 14.90 | 17.48 | 15.87 | 4.27 | 7.90 | 13.65 | 14.29 | 15.50 |
| 50th-Percentile Queue Length [ft/ln] | 372.44 | 436.98 | 396.82 | 106.82 | 197.49 | 341.35 | 357.22 | 387.56 |
| 95th-Percentile Queue Length [veh/ln] | 21.23 | 24.34 | 22.41 | 7.66 | 12.51 | 19.71 | 20.49 | 21.96 |
| 95th-Percentile Queue Length [ft/ln] | 530.69 | 608.40 | 560.16 | 191.56 | 312.73 | 492.85 | 512.20 | 548.99 |

**Movement, Approach, & Intersection Results**

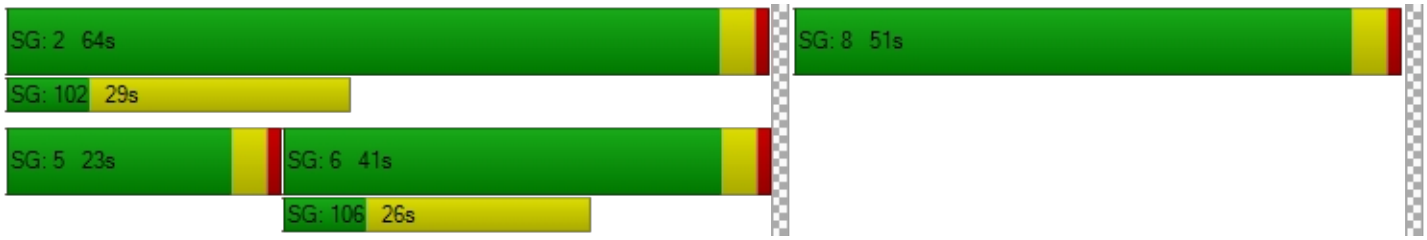
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 37.81 | 45.64 | 39.05 | 0.00 | 0.00 | 45.29 | 57.59 | 19.99 | 0.00 | 0.00 | 38.48 | 43.39 |
| Movement LOS | D | D | D | | | D | E | B | | | D | D |
| d_A, Approach Delay [s/veh] | 38.42 | | | 45.29 | | | 23.95 | | | 38.56 | | |
| Approach LOS | D | | | D | | | C | | | D | | |
| d_I, Intersection Delay [s/veh] | 33.97 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.859 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 47.01 | 47.01 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.769 | 2.176 | 0.000 | 0.000 |
| Crosswalk LOS | C | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 818 | 331 | 1044 | 644 |
| d_b, Bicycle Delay [s] | 20.09 | 40.06 | 13.14 | 26.44 |
| l_b,int, Bicycle LOS Score for Intersection | 5.427 | 1.560 | 2.885 | 2.465 |
| Bicycle LOS | F | A | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 37.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.855 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 250 | 186 | 115 | 313 | 238 | 194 | 244 | 1929 | 257 | 152 | 1688 | 217 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 250 | 186 | 115 | 313 | 238 | 194 | 244 | 1929 | 257 | 152 | 1688 | 217 |
| Peak Hour Factor | 0.9140 | 0.9140 | 0.9140 | 0.8970 | 0.8970 | 0.8970 | 0.9020 | 0.9020 | 0.9020 | 0.9490 | 0.9490 | 0.9490 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 68 | 51 | 31 | 87 | 66 | 54 | 68 | 535 | 71 | 40 | 445 | 57 |
| Total Analysis Volume [veh/h] | 274 | 204 | 126 | 349 | 265 | 216 | 271 | 2139 | 285 | 160 | 1779 | 229 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 15 | 39 | 0 | 18 | 42 | 0 | 27 | 47 | 0 | 16 | 36 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 29 | 0 | 0 | 26 | 0 | 0 | 25 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 11 | 17 | 17 | 14 | 19 | 19 | 20 | 61 | 61 | 12 | 54 | 54 |
| g / C, Green / Cycle | 0.09 | 0.14 | 0.14 | 0.12 | 0.16 | 0.16 | 0.17 | 0.51 | 0.51 | 0.10 | 0.45 | 0.45 |
| (v / s)_i Volume / Saturation Flow Rate | 0.08 | 0.09 | 0.08 | 0.10 | 0.14 | 0.11 | 0.15 | 0.42 | 0.43 | 0.09 | 0.26 | 0.27 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 323 | 264 | 264 | 404 | 308 | 308 | 300 | 1944 | 972 | 181 | 2540 | 847 |
| d1, Uniform Delay [s] | 53.67 | 48.99 | 48.45 | 52.18 | 48.95 | 47.53 | 49.09 | 24.71 | 25.31 | 53.31 | 25.03 | 25.22 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.16 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 6.20 | 2.81 | 2.08 | 5.60 | 6.94 | 2.89 | 13.63 | 4.07 | 9.18 | 13.11 | 1.01 | 3.17 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.85 | 0.66 | 0.59 | 0.86 | 0.86 | 0.70 | 0.90 | 0.82 | 0.85 | 0.88 | 0.59 | 0.60 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 59.87 | 51.79 | 50.53 | 57.78 | 55.89 | 50.41 | 62.71 | 28.79 | 34.49 | 66.41 | 26.04 | 28.39 |
| Lane Group LOS | E | D | D | E | E | D | E | C | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 4.35 | 5.17 | 4.53 | 5.47 | 8.31 | 6.35 | 9.08 | 19.56 | 22.00 | 5.42 | 10.79 | 11.61 |
| 50th-Percentile Queue Length [ft/ln] | 108.73 | 129.22 | 113.14 | 136.84 | 207.72 | 158.80 | 227.05 | 488.92 | 549.94 | 135.51 | 269.80 | 290.19 |
| 95th-Percentile Queue Length [veh/ln] | 7.77 | 8.90 | 8.01 | 9.31 | 13.04 | 10.49 | 14.02 | 26.81 | 29.69 | 9.24 | 16.18 | 17.20 |
| 95th-Percentile Queue Length [ft/ln] | 194.24 | 222.43 | 200.36 | 232.76 | 325.90 | 262.14 | 350.61 | 670.24 | 742.24 | 230.97 | 404.49 | 429.88 |

**Movement, Approach, & Intersection Results**

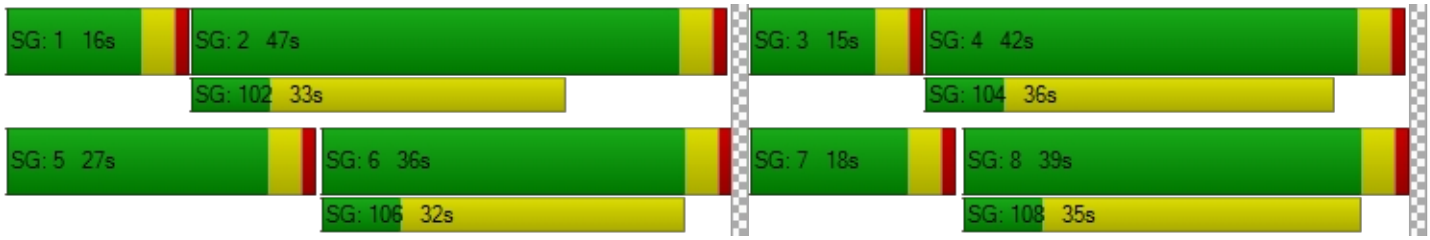
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 59.87 | 51.61 | 50.53 | 57.78 | 55.89 | 50.41 | 62.71 | 30.23 | 34.49 | 66.41 | 26.41 | 28.39 |
| Movement LOS | E | D | D | E | E | D | E | C | C | E | C | C |
| d_A, Approach Delay [s/veh] | 55.13 | | | 55.26 | | | 33.95 | | | 29.57 | | |
| Approach LOS | E | | | E | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 37.28 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.855 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 49.52 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.570 | 2.716 | 3.344 | 3.322 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 583 | 633 | 716 | 533 |
| d_b, Bicycle Delay [s] | 30.12 | 28.03 | 24.72 | 32.28 |
| l_b,int, Bicycle LOS Score for Intersection | 2.058 | 2.929 | 3.042 | 2.454 |
| Bicycle LOS | B | C | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 23.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.816 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 184 | 18 | 244 | 27 | 11 | 12 | 25 | 2050 | 312 | 212 | 1960 | 48 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 184 | 18 | 244 | 27 | 11 | 12 | 25 | 2050 | 312 | 212 | 1960 | 48 |
| Peak Hour Factor | 0.9770 | 0.9770 | 0.9770 | 0.8650 | 0.8650 | 0.8650 | 0.9010 | 0.9010 | 0.9010 | 0.9030 | 0.9030 | 0.9030 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 47 | 5 | 62 | 8 | 3 | 3 | 7 | 569 | 87 | 59 | 543 | 13 |
| Total Analysis Volume [veh/h] | 188 | 18 | 250 | 31 | 13 | 14 | 28 | 2275 | 346 | 235 | 2171 | 53 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 95 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 26 | 0 | 0 | 10 | 0 | 10 | 32 | 0 | 27 | 49 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 14 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 15 | 15 | 15 | 5 | 5 | 3 | 45 | 45 | 14 | 56 | 56 |
| g / C, Green / Cycle | 0.16 | 0.16 | 0.16 | 0.05 | 0.05 | 0.03 | 0.47 | 0.47 | 0.15 | 0.59 | 0.59 |
| (v / s)_i Volume / Saturation Flow Rate | 0.06 | 0.06 | 0.13 | 0.02 | 0.01 | 0.02 | 0.40 | 0.18 | 0.13 | 0.38 | 0.40 |
| s, saturation flow rate [veh/h] | 1750 | 1750 | 1900 | 1800 | 1900 | 1800 | 5700 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 277 | 277 | 300 | 91 | 96 | 62 | 2680 | 893 | 275 | 2237 | 1119 |
| d1, Uniform Delay [s] | 35.82 | 35.84 | 38.83 | 43.63 | 43.50 | 45.07 | 22.23 | 16.33 | 39.27 | 13.07 | 13.44 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.83 | 0.84 | 5.95 | 2.18 | 1.57 | 5.12 | 3.59 | 1.27 | 7.41 | 1.50 | 3.37 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.37 | 0.37 | 0.83 | 0.34 | 0.28 | 0.45 | 0.85 | 0.39 | 0.85 | 0.65 | 0.68 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 36.65 | 36.68 | 44.79 | 45.81 | 45.06 | 50.20 | 25.82 | 17.60 | 46.68 | 14.57 | 16.81 |
| Lane Group LOS | D | D | D | D | D | D | C | B | D | B | B |
| Critical Lane Group | No | No | Yes | Yes | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.17 | 2.19 | 6.07 | 0.76 | 0.65 | 0.73 | 14.88 | 5.00 | 5.84 | 9.90 | 11.17 |
| 50th-Percentile Queue Length [ft/ln] | 54.30 | 54.79 | 151.71 | 18.89 | 16.25 | 18.29 | 371.91 | 125.08 | 145.94 | 247.53 | 279.21 |
| 95th-Percentile Queue Length [veh/ln] | 3.91 | 3.95 | 10.11 | 1.36 | 1.17 | 1.32 | 21.20 | 8.67 | 9.80 | 15.06 | 16.65 |
| 95th-Percentile Queue Length [ft/ln] | 97.75 | 98.63 | 252.70 | 34.00 | 29.25 | 32.93 | 530.05 | 216.78 | 245.00 | 376.54 | 416.23 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 36.66 | 36.68 | 44.79 | 45.81 | 45.06 | 45.06 | 50.20 | 25.82 | 17.60 | 46.68 | 15.30 | 16.81 |
| Movement LOS | D | D | D | D | D | D | D | C | B | D | B | B |
| d_A, Approach Delay [s/veh] | 41.12 | | | 45.46 | | | 25.00 | | | 18.33 | | |
| Approach LOS | D | | | D | | | C | | | B | | |
| d_I, Intersection Delay [s/veh] | 23.60 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.816 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 37.18 | 37.18 | 0.00 | 37.18 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.389 | 1.994 | 0.000 | 3.295 |
| Crosswalk LOS | B | A | F | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 463 | 126 | 589 | 947 |
| d_b, Bicycle Delay [s] | 28.09 | 41.73 | 23.66 | 13.19 |
| l_b,int, Bicycle LOS Score for Intersection | 2.312 | 1.655 | 3.017 | 2.912 |
| Bicycle LOS | B | A | C | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |



*APPENDIX D-IV*

# YEAR 2026 PLUS PROJECT WITH IMPROVEMENTS TRAFFIC CONDITIONS

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 HCM Network.vistro
Report File: N:\...\AM 2026+P-MIT.pdf

Scenario 21 [MIT] AM 2026+P
4/13/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 14 | State College Boulevard at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.842 | 34.1 | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 34.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.842 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 119 | 178 | 429 | 126 | 407 | 28 | 35 | 1725 | 204 | 462 | 1859 | 196 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 119 | 178 | 429 | 126 | 407 | 28 | 35 | 1725 | 204 | 462 | 1859 | 196 |
| Peak Hour Factor | 0.9050 | 0.9050 | 0.9050 | 0.9420 | 0.9420 | 0.9420 | 0.9090 | 0.9090 | 0.9090 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 33 | 49 | 119 | 33 | 108 | 7 | 10 | 474 | 56 | 128 | 516 | 54 |
| Total Analysis Volume [veh/h] | 131 | 197 | 474 | 134 | 432 | 30 | 39 | 1898 | 224 | 513 | 2066 | 218 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 110 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 12 | 41 | 0 | 10 | 39 | 0 | 10 | 37 | 0 | 22 | 49 | 49 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 23 | 0 | 0 | 26 | 26 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 6 | 30 | 30 | 6 | 30 | 30 | 4 | 40 | 40 | 18 | 54 | 64 |
| g / C, Green / Cycle | 0.05 | 0.27 | 0.27 | 0.05 | 0.27 | 0.27 | 0.04 | 0.36 | 0.36 | 0.16 | 0.49 | 0.58 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.05 | 0.25 | 0.04 | 0.11 | 0.02 | 0.01 | 0.28 | 0.28 | 0.15 | 0.36 | 0.11 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 193 | 1032 | 516 | 194 | 1032 | 516 | 136 | 2079 | 693 | 570 | 2786 | 1103 |
| d1, Uniform Delay [s] | 51.04 | 30.80 | 38.92 | 51.08 | 32.95 | 29.67 | 51.42 | 30.73 | 31.06 | 45.20 | 22.57 | 10.95 |
| k, delay calibration | 0.11 | 0.11 | 0.27 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.10 | 0.09 | 15.09 | 4.37 | 0.27 | 0.05 | 1.14 | 2.68 | 8.52 | 5.46 | 1.83 | 0.40 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.68 | 0.19 | 0.92 | 0.69 | 0.42 | 0.06 | 0.29 | 0.76 | 0.78 | 0.90 | 0.74 | 0.20 |
| d, Delay for Lane Group [s/veh] | 55.15 | 30.89 | 54.01 | 55.45 | 33.22 | 29.72 | 52.55 | 33.41 | 39.58 | 50.65 | 24.40 | 11.35 |
| Lane Group LOS | E | C | D | E | C | C | D | C | D | D | C | B |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 1.88 | 2.02 | 14.39 | 1.93 | 4.76 | 0.60 | 0.54 | 12.57 | 14.15 | 7.26 | 14.23 | 2.57 |
| 50th-Percentile Queue Length [ft/ln] | 47.00 | 50.61 | 359.83 | 48.23 | 118.94 | 14.92 | 13.61 | 314.25 | 353.83 | 181.46 | 355.73 | 64.31 |
| 95th-Percentile Queue Length [veh/ln] | 3.38 | 3.64 | 20.62 | 3.47 | 8.33 | 1.07 | 0.98 | 18.38 | 20.32 | 11.68 | 20.42 | 4.63 |
| 95th-Percentile Queue Length [ft/ln] | 84.60 | 91.10 | 515.38 | 86.82 | 208.37 | 26.86 | 24.49 | 459.61 | 508.08 | 291.92 | 510.39 | 115.75 |

**Movement, Approach, & Intersection Results**

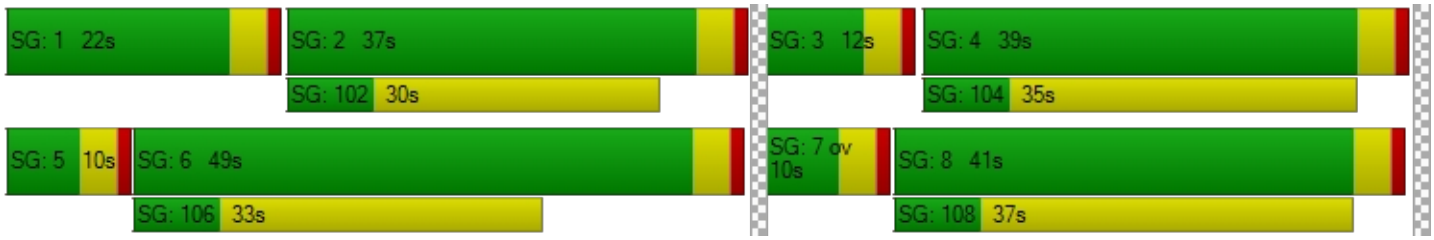
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 55.15 | 30.89 | 54.01 | 55.45 | 33.22 | 29.72 | 52.55 | 34.44 | 39.58 | 50.65 | 24.40 | 11.35 |
| Movement LOS | E | C | D | E | C | C | D | C | D | D | C | B |
| d_A, Approach Delay [s/veh] | 48.52 | | | 38.04 | | | 35.30 | | | 28.19 | | |
| Approach LOS | D | | | D | | | D | | | C | | |
| d_I, Intersection Delay [s/veh] | 34.10 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.842 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 44.58 | 44.58 | 44.58 | 44.58 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.878 | 2.750 | 3.334 | 3.493 |
| Crosswalk LOS | C | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 672 | 636 | 600 | 818 |
| d_b, Bicycle Delay [s] | 24.25 | 25.59 | 26.97 | 19.23 |
| l_b,int, Bicycle LOS Score for Intersection | 2.221 | 2.051 | 2.451 | 3.098 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



Brea Mall Expansion, Brea

Vistro File: N:\...\4099 HCM Network.vistro
Report File: N:\...\PM 2026+P-MIT.pdf

Scenario 20 [MIT] PM 2026+P
4/13/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 14 | State College Boulevard at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.934 | 45.0 | D |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 45.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.934 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 391 | 625 | 370 | 463 | 323 | 98 | 112 | 1991 | 116 | 474 | 2019 | 574 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 391 | 625 | 370 | 463 | 323 | 98 | 112 | 1991 | 116 | 474 | 2019 | 574 |
| Peak Hour Factor | 0.8990 | 0.8990 | 0.8990 | 0.8970 | 0.8970 | 0.8970 | 0.9570 | 0.9570 | 0.9570 | 0.9550 | 0.9550 | 0.9550 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 109 | 174 | 103 | 129 | 90 | 27 | 29 | 520 | 30 | 124 | 529 | 150 |
| Total Analysis Volume [veh/h] | 435 | 695 | 412 | 516 | 360 | 109 | 117 | 2080 | 121 | 496 | 2114 | 601 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 23 | 41 | 0 | 21 | 39 | 0 | 10 | 37 | 0 | 21 | 48 | 48 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 23 | 0 | 0 | 26 | 26 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 17 | 30 | 30 | 17 | 30 | 30 | 6 | 40 | 40 | 17 | 52 | 73 |
| g / C, Green / Cycle | 0.14 | 0.25 | 0.25 | 0.14 | 0.25 | 0.25 | 0.05 | 0.34 | 0.34 | 0.14 | 0.43 | 0.60 |
| (v / s)_i Volume / Saturation Flow Rate | 0.12 | 0.18 | 0.22 | 0.15 | 0.09 | 0.06 | 0.03 | 0.29 | 0.30 | 0.14 | 0.37 | 0.32 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 497 | 935 | 467 | 497 | 935 | 468 | 174 | 1919 | 640 | 497 | 2445 | 1148 |
| d1, Uniform Delay [s] | 50.47 | 41.76 | 43.57 | 51.51 | 37.69 | 36.19 | 56.08 | 36.95 | 37.91 | 51.49 | 31.12 | 13.75 |
| k, delay calibration | 0.11 | 0.11 | 0.24 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.06 | 1.19 | 11.35 | 29.53 | 0.26 | 0.25 | 4.44 | 4.85 | 18.13 | 18.27 | 4.39 | 1.71 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.88 | 0.74 | 0.88 | 1.04 | 0.38 | 0.23 | 0.67 | 0.85 | 0.90 | 1.00 | 0.86 | 0.52 |
| d, Delay for Lane Group [s/veh] | 55.53 | 42.95 | 54.92 | 81.03 | 37.95 | 36.44 | 60.52 | 41.80 | 56.03 | 69.76 | 35.51 | 15.46 |
| Lane Group LOS | E | D | D | F | D | D | E | D | E | E | D | B |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 6.74 | 9.62 | 13.18 | 9.49 | 4.46 | 2.61 | 1.85 | 15.42 | 19.11 | 8.70 | 19.07 | 9.60 |
| 50th-Percentile Queue Length [ft/ln] | 168.51 | 240.49 | 329.55 | 237.28 | 111.45 | 65.15 | 46.28 | 385.62 | 477.70 | 217.39 | 476.75 | 239.94 |
| 95th-Percentile Queue Length [veh/ln] | 11.00 | 14.71 | 19.14 | 14.79 | 7.92 | 4.69 | 3.33 | 21.87 | 26.28 | 13.53 | 26.23 | 14.68 |
| 95th-Percentile Queue Length [ft/ln] | 274.95 | 367.65 | 478.41 | 369.77 | 198.02 | 117.26 | 83.30 | 546.64 | 656.92 | 338.29 | 655.79 | 366.96 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 55.53 | 42.95 | 54.92 | 81.03 | 37.95 | 36.44 | 60.52 | 44.91 | 56.03 | 69.76 | 35.51 | 15.46 |
| Movement LOS | E | D | D | F | D | D | E | D | E | E | D | B |
| d_A, Approach Delay [s/veh] | 49.70 | | | 60.35 | | | 46.28 | | | 37.05 | | |
| Approach LOS | D | | | E | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 44.98 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.934 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 49.52 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.959 | 2.942 | 3.402 | 3.587 |
| Crosswalk LOS | C | C | C | D |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 617 | 583 | 550 | 733 |
| d_b, Bicycle Delay [s] | 28.72 | 30.12 | 31.55 | 24.08 |
| l_b,int, Bicycle LOS Score for Intersection | 2.832 | 2.372 | 2.516 | 3.326 |
| Bicycle LOS | C | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



Brea Mall Expansion, Brea

Vistro File: N:\...\4099 HCM Network.vistro
Report File: N:\...\Sat 2026+P-MIT.pdf

Scenario 19 [MIT] Sat MD 2026+P
4/13/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 14 | State College Boulevard at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 1.200 | 108.6 | F |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 108.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | F |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.200 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 331 | 564 | 607 | 655 | 443 | 186 | 139 | 1695 | 233 | 684 | 2092 | 991 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 331 | 564 | 607 | 655 | 443 | 186 | 139 | 1695 | 233 | 684 | 2092 | 991 |
| Peak Hour Factor | 0.9800 | 0.9800 | 0.9800 | 0.8330 | 0.8330 | 0.8330 | 0.9250 | 0.9250 | 0.9250 | 0.9230 | 0.9230 | 0.9230 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 84 | 144 | 155 | 197 | 133 | 56 | 38 | 458 | 63 | 185 | 567 | 268 |
| Total Analysis Volume [veh/h] | 338 | 576 | 619 | 786 | 532 | 223 | 150 | 1832 | 252 | 741 | 2267 | 1074 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 25 | 41 | 0 | 23 | 39 | 0 | 10 | 34 | 0 | 22 | 46 | 46 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 23 | 0 | 0 | 23 | 23 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 14 | 37 | 37 | 19 | 42 | 42 | 6 | 30 | 30 | 18 | 42 | 65 |
| g / C, Green / Cycle | 0.12 | 0.31 | 0.31 | 0.16 | 0.35 | 0.35 | 0.05 | 0.25 | 0.25 | 0.15 | 0.35 | 0.54 |
| (v / s)_i Volume / Saturation Flow Rate | 0.10 | 0.15 | 0.33 | 0.22 | 0.14 | 0.12 | 0.04 | 0.27 | 0.28 | 0.21 | 0.40 | 0.57 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 407 | 1166 | 583 | 554 | 1326 | 663 | 176 | 1432 | 477 | 525 | 2001 | 1031 |
| d1, Uniform Delay [s] | 51.86 | 33.97 | 41.59 | 50.50 | 29.57 | 28.82 | 56.56 | 44.93 | 44.93 | 51.00 | 38.94 | 27.43 |
| k, delay calibration | 0.11 | 0.11 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.40 | 0.32 | 54.60 | 190.33 | 0.20 | 0.30 | 11.08 | 51.04 | 73.18 | 187.32 | 66.59 | 39.35 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.83 | 0.49 | 1.06 | 1.42 | 0.40 | 0.34 | 0.85 | 1.09 | 1.11 | 1.41 | 1.13 | 1.04 |
| d, Delay for Lane Group [s/veh] | 56.26 | 34.30 | 96.19 | 240.83 | 29.77 | 29.11 | 67.64 | 95.97 | 118.11 | 238.32 | 105.52 | 66.78 |
| Lane Group LOS | E | C | F | F | C | C | E | F | F | F | F | F |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 5.22 | 6.91 | 25.84 | 22.95 | 5.85 | 4.80 | 2.53 | 20.85 | 23.79 | 21.53 | 31.63 | 39.19 |
| 50th-Percentile Queue Length [ft/ln] | 130.49 | 172.72 | 646.06 | 573.67 | 146.25 | 120.09 | 63.14 | 521.37 | 594.76 | 538.26 | 790.81 | 979.79 |
| 95th-Percentile Queue Length [veh/ln] | 8.97 | 11.22 | 35.55 | 35.58 | 9.82 | 8.40 | 4.55 | 29.76 | 33.73 | 33.50 | 44.38 | 51.17 |
| 95th-Percentile Queue Length [ft/ln] | 224.16 | 280.48 | 888.64 | 889.56 | 245.41 | 209.95 | 113.65 | 744.11 | 843.22 | 837.44 | 1109.51 | 1279.30 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 56.26 | 34.30 | 96.19 | 240.83 | 29.77 | 29.11 | 67.64 | 99.30 | 118.11 | 238.32 | 105.52 | 66.78 |
| Movement LOS | E | C | F | F | C | C | E | F | F | F | F | F |
| d_A, Approach Delay [s/veh] | 64.13 | | | 137.33 | | | 99.30 | | | 119.44 | | |
| Approach LOS | E | | | F | | | F | | | F | | |
| d_I, Intersection Delay [s/veh] | 108.55 | | | | | | | | | | | |
| Intersection LOS | F | | | | | | | | | | | |
| Intersection V/C | 1.200 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.51 | 49.51 | 49.51 | 49.51 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.034 | 3.073 | 3.411 | 3.694 |
| Crosswalk LOS | C | C | C | D |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 617 | 583 | 500 | 700 |
| d_b, Bicycle Delay [s] | 28.71 | 30.11 | 33.75 | 25.35 |
| l_b,int, Bicycle LOS Score for Intersection | 2.824 | 2.831 | 2.481 | 3.805 |
| Bicycle LOS | C | C | B | D |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



*APPENDIX D-V*

# YEAR 2045 TRAFFIC CONDITIONS

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 HCM Network.vistro
Report File: N:\...\AM 2045.pdf

Scenario 10 AM 2045
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | HCM 6th Edition | NB Thru | 0.893 | 39.9 | D |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | HCM 6th Edition | WB Left | 0.838 | 24.4 | C |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | HCM 6th Edition | NB Left | 0.884 | 22.1 | C |
| 4 | Randolph Avenue at Birch Street | Signalized | HCM 6th Edition | WB Left | 0.348 | 14.2 | B |
| 5 | State College Boulevard at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.645 | 40.4 | D |
| 6 | S Associated Road at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.779 | 26.8 | C |
| 7 | Randolph Avenue at Madison Way | Signalized | HCM 6th Edition | SB Left | 0.105 | 15.2 | B |
| 8 | Randolph Avenue at Brea Mall | Signalized | HCM 6th Edition | EB Left | 0.094 | 6.1 | A |
| 9 | Brea Mall South at State College Boulevard | Signalized | HCM 6th Edition | WB Left | 0.236 | 12.8 | B |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | HCM 6th Edition | NB Left | 1.029 | 57.6 | E |
| 11 | Puente Street at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.662 | 21.1 | C |
| 12 | Brea Boulevard at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.943 | 46.8 | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.518 | 13.2 | B |
| 14 | State College Boulevard at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.846 | 36.0 | D |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.678 | 15.8 | B |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | HCM 6th Edition | NB Thru | 0.678 | 25.0 | C |
| 17 | Associated Road at Imperial Highway | Signalized | HCM 6th Edition | NB Left | 0.839 | 33.1 | C |
| 18 | Castlegate Lane/Placentia | Signalized | HCM 6th | EB Left | 0.733 | 18.7 | B |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | Edition | EB Left | 0.733 | 18.7 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 39.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.893 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 194 | 247 | 228 | 1011 | 688 | 9 | 16 | 1594 | 238 | 534 | 2035 | 627 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 194 | 247 | 228 | 1011 | 688 | 9 | 16 | 1594 | 238 | 534 | 2035 | 627 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 49 | 62 | 57 | 253 | 172 | 2 | 4 | 399 | 60 | 134 | 509 | 157 |
| Total Analysis Volume [veh/h] | 194 | 247 | 228 | 1011 | 688 | 9 | 16 | 1594 | 238 | 534 | 2035 | 627 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 13 | 15 | 0 | 42 | 44 | 0 | 10 | 39 | 0 | 24 | 53 | 53 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 28 | 0 | 0 | 22 | 22 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 9 | 12 | 12 | 12 | 37 | 40 | 40 | 3 | 35 | 35 | 20 | 52 | 94 |
| g / C, Green / Cycle | 0.07 | 0.10 | 0.10 | 0.10 | 0.31 | 0.34 | 0.34 | 0.02 | 0.29 | 0.29 | 0.17 | 0.44 | 0.78 |
| (v / s)_i Volume / Saturation Flow Rate | 0.06 | 0.09 | 0.08 | 0.08 | 0.29 | 0.18 | 0.18 | 0.00 | 0.24 | 0.24 | 0.15 | 0.36 | 0.33 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1900 | 3500 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 252 | 189 | 189 | 189 | 1083 | 641 | 641 | 76 | 1658 | 553 | 584 | 2486 | 1480 |
| d1, Uniform Delay [s] | 54.75 | 53.46 | 53.07 | 52.75 | 40.26 | 32.31 | 32.30 | 57.73 | 39.75 | 39.87 | 49.17 | 29.68 | 4.38 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.12 | 0.12 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.97 | 14.15 | 9.11 | 6.71 | 4.40 | 0.83 | 0.83 | 1.37 | 4.88 | 13.87 | 6.12 | 3.15 | 0.89 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.77 | 0.90 | 0.83 | 0.78 | 0.93 | 0.54 | 0.54 | 0.21 | 0.83 | 0.83 | 0.91 | 0.82 | 0.42 |
| d, Delay for Lane Group [s/veh] | 59.72 | 67.61 | 62.18 | 59.46 | 44.66 | 33.14 | 33.12 | 59.10 | 44.63 | 53.74 | 55.28 | 32.83 | 5.27 |
| Lane Group LOS | E | E | E | E | D | C | C | E | D | D | E | C | A |
| Critical Lane Group | No | Yes | No | No | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 3.06 | 5.83 | 5.14 | 4.68 | 14.98 | 8.36 | 8.34 | 0.25 | 13.23 | 14.77 | 8.34 | 17.48 | 4.54 |
| 50th-Percentile Queue Length [ft/ln] | 76.41 | 145.6 | 128.5 | 116.9 | 374.52 | 209.05 | 208.52 | 6.34 | 330.68 | 369.15 | 208.52 | 437.12 | 113.54 |
| 95th-Percentile Queue Length [veh/ln] | 5.50 | 9.79 | 8.86 | 8.23 | 21.33 | 13.10 | 13.08 | 0.46 | 19.19 | 21.07 | 13.08 | 24.34 | 8.04 |
| 95th-Percentile Queue Length [ft/ln] | 137.5 | 244.6 | 221.5 | 205.6 | 533.21 | 327.61 | 326.92 | 11.41 | 479.79 | 526.70 | 326.92 | 608.56 | 200.91 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 59.72 | 65.93 | 60.33 | 44.66 | 33.13 | 33.12 | 59.10 | 45.90 | 53.74 | 55.28 | 32.83 | 5.27 |
| Movement LOS | E | E | E | D | C | C | E | D | D | E | C | A |
| d_A, Approach Delay [s/veh] | 62.25 | | | 39.96 | | | 47.03 | | | 31.18 | | |
| Approach LOS | E | | | D | | | D | | | C | | |
| d_I, Intersection Delay [s/veh] | 39.95 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.893 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.904 | 2.889 | 3.306 | 0.000 |
| Crosswalk LOS | C | C | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 183 | 666 | 583 | 816 |
| d_b, Bicycle Delay [s] | 49.52 | 26.68 | 30.12 | 21.02 |
| l_b,int, Bicycle LOS Score for Intersection | 2.112 | 2.969 | 2.322 | 3.317 |
| Bicycle LOS | B | C | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 24.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.838 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 1084 | 0 | 725 | 0 | 1946 | 650 | 285 | 2284 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 1084 | 0 | 725 | 0 | 1946 | 650 | 285 | 2284 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 271 | 0 | 181 | 0 | 487 | 163 | 71 | 571 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 1084 | 0 | 725 | 0 | 1946 | 650 | 285 | 2284 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 95 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 44 | 0 | 0 | 0 | 38 | 0 | 13 | 51 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 20 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | No | No | |
| Maximum Recall | | | | No | | | | No | | No | No | |
| Pedestrian Recall | | | | No | | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | R | C | R | L | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 95 | 95 | 95 | 95 | 95 | 95 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 34 | 34 | 40 | 40 | 9 | 53 |
| g / C, Green / Cycle | | 0.36 | 0.36 | 0.42 | 0.42 | 0.10 | 0.56 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.31 | 0.19 | 0.34 | 0.17 | 0.08 | 0.40 |
| s, saturation flow rate [veh/h] | | 3500 | 3800 | 5700 | 3800 | 3500 | 5700 |
| c, Capacity [veh/h] | | 1262 | 1370 | 2381 | 1587 | 335 | 3166 |
| d1, Uniform Delay [s] | | 28.15 | 24.02 | 24.46 | 19.43 | 42.31 | 15.67 |
| k, delay calibration | | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 1.83 | 0.32 | 3.25 | 0.78 | 6.13 | 1.46 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.86 | 0.53 | 0.82 | 0.41 | 0.85 | 0.72 |
| d, Delay for Lane Group [s/veh] | | 29.98 | 24.34 | 27.72 | 20.22 | 48.44 | 17.13 |
| Lane Group LOS | | C | C | C | C | D | B |
| Critical Lane Group | | Yes | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | | 11.31 | 6.33 | 13.00 | 5.06 | 3.54 | 11.67 |
| 50th-Percentile Queue Length [ft/ln] | | 282.77 | 158.28 | 325.02 | 126.56 | 88.55 | 291.72 |
| 95th-Percentile Queue Length [veh/ln] | | 16.83 | 10.46 | 18.91 | 8.75 | 6.38 | 17.27 |
| 95th-Percentile Queue Length [ft/ln] | | 420.67 | 261.44 | 472.86 | 218.81 | 159.39 | 431.77 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 29.98 | 0.00 | 24.34 | 0.00 | 27.72 | 20.22 | 48.44 | 17.13 | 0.00 |
| Movement LOS | | | | C | | C | | C | C | D | B | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 27.72 | | | 25.84 | | | 20.60 | | |
| Approach LOS | A | | | C | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 24.40 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.838 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 37.14 | 37.14 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.173 | 2.574 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 842 | 716 | 989 |
| d_b, Bicycle Delay [s] | 47.51 | 15.93 | 19.59 | 12.13 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 1.560 | 2.987 | 2.973 |
| Bicycle LOS | D | A | C | C |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 22.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.884 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | | | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | | | | No | | | No | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1104 | 0 | 534 | 0 | 0 | 0 | 0 | 2603 | 419 | 0 | 1456 | 530 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1104 | 0 | 534 | 0 | 0 | 0 | 0 | 2603 | 419 | 0 | 1456 | 530 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 276 | 0 | 134 | 0 | 0 | 0 | 0 | 651 | 105 | 0 | 364 | 0 |
| Total Analysis Volume [veh/h] | 1104 | 0 | 534 | 0 | 0 | 0 | 0 | 2603 | 419 | 0 | 1456 | 0 |
| Presence of On-Street Parking | No | | No | | | | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 95 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 59 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 36 | 0 |
| Vehicle Extension [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | No | | | | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | | | | | | | No | | | No | |
| Maximum Recall | No | | | | | | | No | | | No | |
| Pedestrian Recall | No | | | | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | R | | C | C | R | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 95 | 95 | | 95 | 95 | 95 | 95 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 35 | 35 | | 51 | 51 | 51 | 51 |
| g / C, Green / Cycle | 0.37 | 0.37 | | 0.54 | 0.54 | 0.54 | 0.54 |
| (v / s)_i Volume / Saturation Flow Rate | 0.32 | 0.28 | | 0.46 | 0.46 | 0.22 | 0.26 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | | 3800 | 1900 | 1900 | 5700 |
| c, Capacity [veh/h] | 1306 | 709 | | 2062 | 1031 | 1031 | 3093 |
| d1, Uniform Delay [s] | 27.24 | 25.93 | | 18.27 | 18.27 | 12.74 | 13.33 |
| k, delay calibration | 0.11 | 0.11 | | 0.50 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.59 | 1.65 | | 4.37 | 8.31 | 1.19 | 0.52 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.85 | 0.75 | | 0.84 | 0.84 | 0.41 | 0.47 |
| d, Delay for Lane Group [s/veh] | 28.83 | 27.58 | | 22.64 | 26.58 | 13.93 | 13.85 |
| Lane Group LOS | C | C | | C | C | B | B |
| Critical Lane Group | Yes | No | | Yes | No | No | No |
| 50th-Percentile Queue Length [veh/ln] | 11.29 | 10.46 | | 15.92 | 17.05 | 5.28 | 6.14 |
| 50th-Percentile Queue Length [ft/ln] | 282.19 | 261.41 | | 398.11 | 426.31 | 131.99 | 153.42 |
| 95th-Percentile Queue Length [veh/ln] | 16.80 | 15.76 | | 22.47 | 23.82 | 9.05 | 10.20 |
| 95th-Percentile Queue Length [ft/ln] | 419.93 | 393.99 | | 561.72 | 595.62 | 226.20 | 254.99 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 28.83 | 0.00 | 27.58 | 0.00 | 0.00 | 0.00 | 0.00 | 23.53 | 13.93 | 0.00 | 13.85 | 0.00 |
| Movement LOS | C | | C | | | | | C | B | | B | |
| d_A, Approach Delay [s/veh] | 28.42 | | | 0.00 | | | 22.57 | | | 13.85 | | |
| Approach LOS | C | | | A | | | C | | | B | | |
| d_I, Intersection Delay [s/veh] | 22.06 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.884 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 0.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 37.11 | 0.00 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.703 | 0.000 | 0.000 | 0.000 |
| Crosswalk LOS | B | F | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1159 | 0 | 674 | 674 |
| d_b, Bicycle Delay [s] | 8.40 | 47.47 | 20.87 | 20.87 |
| l_b,int, Bicycle LOS Score for Intersection | 1.560 | 4.132 | 3.222 | 2.360 |
| Bicycle LOS | A | D | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 14.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.348 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 26 | 44 | 98 | 86 | 38 | 37 | 43 | 656 | 99 | 84 | 597 | 61 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 26 | 44 | 98 | 86 | 38 | 37 | 43 | 656 | 99 | 84 | 597 | 61 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 11 | 25 | 22 | 10 | 9 | 11 | 164 | 25 | 21 | 149 | 15 |
| Total Analysis Volume [veh/h] | 26 | 44 | 98 | 86 | 38 | 37 | 43 | 656 | 99 | 84 | 597 | 61 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 38 | 0 | 0 | 38 | 0 | 10 | 30 | 0 | 22 | 42 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 25 | 0 | 0 | 19 | 0 | 0 | 18 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 7 | 7 | 7 | 7 | 7 | 4 | 66 | 66 | 6 | 67 | 67 |
| g / C, Green / Cycle | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.04 | 0.73 | 0.73 | 0.06 | 0.75 | 0.75 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.02 | 0.05 | 0.05 | 0.04 | 0.02 | 0.20 | 0.19 | 0.05 | 0.16 | 0.03 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 116 | 145 | 145 | 144 | 145 | 81 | 1385 | 1385 | 111 | 2833 | 1416 |
| d1, Uniform Delay [s] | 38.99 | 39.33 | 40.51 | 40.35 | 40.00 | 42.06 | 4.16 | 4.11 | 41.57 | 3.46 | 3.01 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.97 | 1.17 | 5.43 | 3.92 | 2.85 | 5.26 | 0.50 | 0.47 | 9.91 | 0.17 | 0.06 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.22 | 0.30 | 0.68 | 0.60 | 0.52 | 0.53 | 0.28 | 0.27 | 0.76 | 0.21 | 0.04 |
| d, Delay for Lane Group [s/veh] | 39.96 | 40.50 | 45.94 | 44.27 | 42.85 | 47.32 | 4.66 | 4.58 | 51.48 | 3.63 | 3.07 |
| Lane Group LOS | D | D | D | D | D | D | A | A | D | A | A |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.56 | 0.96 | 2.31 | 1.98 | 1.69 | 1.04 | 2.07 | 1.96 | 2.12 | 1.29 | 0.24 |
| 50th-Percentile Queue Length [ft/ln] | 14.12 | 23.95 | 57.71 | 49.59 | 42.35 | 26.10 | 51.77 | 48.93 | 53.01 | 32.28 | 6.01 |
| 95th-Percentile Queue Length [veh/ln] | 1.02 | 1.72 | 4.15 | 3.57 | 3.05 | 1.88 | 3.73 | 3.52 | 3.82 | 2.32 | 0.43 |
| 95th-Percentile Queue Length [ft/ln] | 25.42 | 43.11 | 103.87 | 89.26 | 76.23 | 46.99 | 93.19 | 88.07 | 95.41 | 58.10 | 10.82 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 39.96 | 40.50 | 45.94 | 44.27 | 42.85 | 42.85 | 47.32 | 4.63 | 4.58 | 51.48 | 3.63 | 3.07 |
| Movement LOS | D | D | D | D | D | D | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 43.59 | | | 43.61 | | | 6.92 | | | 9.00 | | |
| Approach LOS | D | | | D | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 14.20 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.348 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.225 | 2.040 | 2.621 | 2.832 |
| Crosswalk LOS | B | B | B | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 755 | 755 | 578 | 844 |
| d_b, Bicycle Delay [s] | 17.43 | 17.43 | 22.77 | 15.03 |
| l_b,int, Bicycle LOS Score for Intersection | 1.837 | 1.825 | 2.218 | 2.172 |
| Bicycle LOS | A | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 40.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.645 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 88 | 166 | 114 | 776 | 964 | 254 | 125 | 579 | 68 | 101 | 663 | 338 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 88 | 166 | 114 | 776 | 964 | 254 | 125 | 579 | 68 | 101 | 663 | 338 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 22 | 42 | 29 | 194 | 241 | 64 | 31 | 145 | 17 | 25 | 166 | 85 |
| Total Analysis Volume [veh/h] | 88 | 166 | 114 | 776 | 964 | 254 | 125 | 579 | 68 | 101 | 663 | 338 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 26 | 39 | 0 | 32 | 45 | 0 | 10 | 39 | 0 | 10 | 39 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 20 | 20 | 28 | 42 | 42 | 6 | 50 | 50 | 6 | 50 | 50 |
| g / C, Green / Cycle | 0.05 | 0.17 | 0.17 | 0.23 | 0.35 | 0.35 | 0.05 | 0.42 | 0.42 | 0.05 | 0.42 | 0.42 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.04 | 0.06 | 0.22 | 0.32 | 0.32 | 0.04 | 0.15 | 0.04 | 0.03 | 0.17 | 0.18 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 3500 | 1900 | 1900 | 3500 | 3800 | 1900 | 3500 | 3800 | 1900 |
| c, Capacity [veh/h] | 168 | 629 | 315 | 816 | 666 | 666 | 178 | 1592 | 796 | 172 | 1585 | 793 |
| d1, Uniform Delay [s] | 55.79 | 43.71 | 44.47 | 45.34 | 37.25 | 37.25 | 56.10 | 23.92 | 21.03 | 55.90 | 24.70 | 24.81 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.23 | 0.23 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 2.50 | 0.22 | 0.70 | 6.96 | 10.27 | 10.27 | 5.01 | 0.65 | 0.21 | 3.18 | 0.81 | 1.68 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.52 | 0.26 | 0.36 | 0.95 | 0.91 | 0.91 | 0.70 | 0.36 | 0.09 | 0.59 | 0.42 | 0.43 |
| d, Delay for Lane Group [s/veh] | 58.29 | 43.93 | 45.17 | 52.30 | 47.52 | 47.52 | 61.11 | 24.56 | 21.24 | 59.08 | 25.52 | 26.48 |
| Lane Group LOS | E | D | D | D | D | D | E | C | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | 1.36 | 2.19 | 3.09 | 12.10 | 18.72 | 18.72 | 1.99 | 5.77 | 1.21 | 1.58 | 6.81 | 7.16 |
| 50th-Percentile Queue Length [ft/ln] | 34.03 | 54.63 | 77.19 | 302.39 | 467.99 | 467.99 | 49.72 | 144.17 | 30.20 | 39.38 | 170.37 | 179.08 |
| 95th-Percentile Queue Length [veh/ln] | 2.45 | 3.93 | 5.56 | 17.80 | 25.82 | 25.82 | 3.58 | 9.71 | 2.17 | 2.84 | 11.10 | 11.55 |
| 95th-Percentile Queue Length [ft/ln] | 61.26 | 98.33 | 138.93 | 444.98 | 645.38 | 645.38 | 89.50 | 242.63 | 54.36 | 70.89 | 277.40 | 288.81 |

**Movement, Approach, & Intersection Results**

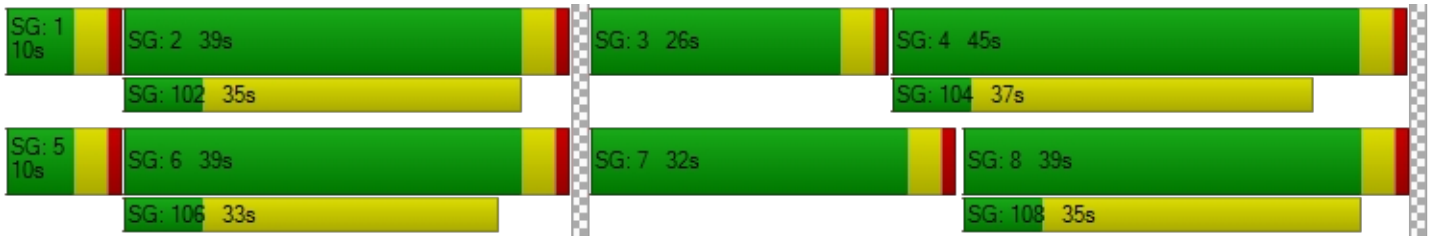
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 58.29 | 43.93 | 45.17 | 52.30 | 47.52 | 47.52 | 61.11 | 24.56 | 21.24 | 59.08 | 25.52 | 26.48 |
| Movement LOS | E | D | D | D | D | D | E | C | C | E | C | C |
| d_A, Approach Delay [s/veh] | 47.75 | | | 49.38 | | | 30.19 | | | 28.89 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 40.41 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.645 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 49.52 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.817 | 2.893 | 2.855 | 2.966 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 583 | 683 | 583 | 583 |
| d_b, Bicycle Delay [s] | 30.12 | 26.02 | 30.12 | 30.12 |
| l_b,int, Bicycle LOS Score for Intersection | 1.863 | 3.205 | 2.197 | 2.469 |
| Bicycle LOS | A | C | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 26.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.779 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 286 | 7 | 364 | 63 | 34 | 11 | 5 | 1098 | 374 | 405 | 894 | 11 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 286 | 7 | 364 | 63 | 34 | 11 | 5 | 1098 | 374 | 405 | 894 | 11 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 72 | 2 | 91 | 16 | 9 | 3 | 1 | 275 | 94 | 101 | 224 | 3 |
| Total Analysis Volume [veh/h] | 286 | 7 | 364 | 63 | 34 | 11 | 5 | 1098 | 374 | 405 | 894 | 11 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 6 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 30 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 23 | 60 | 60 | 0 | 37 | 0 | 10 | 38 | 0 | 22 | 50 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 7 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 26 | 0 | 26 | 0 | 0 | 27 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | No | | No | | No | No | | No | No | |
| Maximum Recall | No | No | No | | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | No | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 12 | 22 | 44 | 6 | 6 | 1 | 68 | 68 | 18 | 85 | 85 |
| g / C, Green / Cycle | 0.10 | 0.19 | 0.37 | 0.05 | 0.05 | 0.01 | 0.56 | 0.56 | 0.15 | 0.71 | 0.71 |
| (v / s)_i Volume / Saturation Flow Rate | 0.08 | 0.00 | 0.19 | 0.04 | 0.02 | 0.00 | 0.40 | 0.37 | 0.12 | 0.24 | 0.24 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 |
| c, Capacity [veh/h] | 353 | 353 | 701 | 120 | 98 | 15 | 1072 | 1072 | 525 | 1342 | 1342 |
| d1, Uniform Delay [s] | 52.82 | 39.94 | 29.54 | 55.96 | 55.31 | 59.20 | 19.00 | 18.23 | 49.03 | 6.81 | 6.80 |
| k, delay calibration | 0.11 | 0.11 | 0.28 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.43 | 0.02 | 1.54 | 3.55 | 3.35 | 13.08 | 3.97 | 3.25 | 2.44 | 0.68 | 0.68 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.81 | 0.02 | 0.52 | 0.53 | 0.46 | 0.34 | 0.71 | 0.66 | 0.77 | 0.34 | 0.34 |
| d, Delay for Lane Group [s/veh] | 57.26 | 39.96 | 31.08 | 59.51 | 58.66 | 72.29 | 22.97 | 21.48 | 51.46 | 7.49 | 7.48 |
| Lane Group LOS | E | D | C | E | E | E | C | C | D | A | A |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 4.44 | 0.17 | 8.47 | 1.99 | 1.42 | 0.20 | 15.92 | 14.21 | 6.01 | 4.36 | 4.34 |
| 50th-Percentile Queue Length [ft/ln] | 110.91 | 4.32 | 211.87 | 49.86 | 35.40 | 5.12 | 398.10 | 355.28 | 150.15 | 109.02 | 108.48 |
| 95th-Percentile Queue Length [veh/ln] | 7.89 | 0.31 | 13.25 | 3.59 | 2.55 | 0.37 | 22.47 | 20.39 | 10.03 | 7.79 | 7.76 |
| 95th-Percentile Queue Length [ft/ln] | 197.27 | 7.77 | 331.23 | 89.76 | 63.71 | 9.21 | 561.71 | 509.84 | 250.63 | 194.64 | 193.88 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 57.26 | 39.96 | 31.08 | 59.51 | 58.66 | 58.66 | 72.29 | 22.51 | 21.48 | 51.46 | 7.49 | 7.48 |
| Movement LOS | E | D | C | E | E | E | E | C | C | D | A | A |
| d_A, Approach Delay [s/veh] | 42.57 | | | 59.15 | | | 22.42 | | | 21.08 | | |
| Approach LOS | D | | | E | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 26.77 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.779 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.51 | 49.51 | 49.51 | 49.51 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.706 | 1.997 | 2.834 | 3.017 |
| Crosswalk LOS | B | A | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 933 | 550 | 567 | 767 |
| d_b, Bicycle Delay [s] | 17.07 | 31.54 | 30.82 | 22.82 |
| l_b,int, Bicycle LOS Score for Intersection | 2.644 | 1.738 | 2.778 | 2.640 |
| Bicycle LOS | B | A | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 15.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.105 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 28 | 146 | 9 | 6 | 137 | 18 | 36 | 3 | 62 | 0 | 0 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 28 | 146 | 9 | 6 | 137 | 18 | 36 | 3 | 62 | 0 | 0 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 37 | 2 | 2 | 34 | 5 | 9 | 1 | 16 | 0 | 0 | 0 |
| Total Analysis Volume [veh/h] | 28 | 146 | 9 | 6 | 137 | 18 | 36 | 3 | 62 | 0 | 0 | 0 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 17 | 46 | 0 | 10 | 39 | 0 | 0 | 34 | 0 | 0 | 34 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 12 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | L | C | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 3 | 72 | 72 | 1 | 69 | 69 | 6 | 6 | 6 | 6 |
| g / C, Green / Cycle | 0.03 | 0.79 | 0.79 | 0.01 | 0.77 | 0.77 | 0.06 | 0.06 | 0.06 | 0.06 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.04 | 0.04 | 0.00 | 0.04 | 0.04 | 0.02 | 0.03 | 0.00 | 0.00 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 63 | 1508 | 1508 | 19 | 1462 | 1462 | 158 | 119 | 100 | 119 |
| d1, Uniform Delay [s] | 42.61 | 2.00 | 2.00 | 44.22 | 2.49 | 2.49 | 40.39 | 40.98 | 0.00 | 0.00 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.92 | 0.06 | 0.06 | 9.13 | 0.07 | 0.07 | 0.72 | 3.90 | 0.00 | 0.00 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.45 | 0.05 | 0.05 | 0.32 | 0.05 | 0.05 | 0.23 | 0.55 | 0.00 | 0.00 |
| d, Delay for Lane Group [s/veh] | 47.53 | 2.06 | 2.06 | 53.35 | 2.56 | 2.56 | 41.11 | 44.89 | 0.00 | 0.00 |
| Lane Group LOS | D | A | A | D | A | A | D | D | A | A |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.69 | 0.21 | 0.21 | 0.18 | 0.26 | 0.26 | 0.79 | 1.51 | 0.00 | 0.00 |
| 50th-Percentile Queue Length [ft/ln] | 17.26 | 5.23 | 5.19 | 4.50 | 6.50 | 6.42 | 19.69 | 37.83 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [veh/ln] | 1.24 | 0.38 | 0.37 | 0.32 | 0.47 | 0.46 | 1.42 | 2.72 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln] | 31.07 | 9.41 | 9.35 | 8.10 | 11.70 | 11.55 | 35.44 | 68.10 | 0.00 | 0.00 |

**Movement, Approach, & Intersection Results**

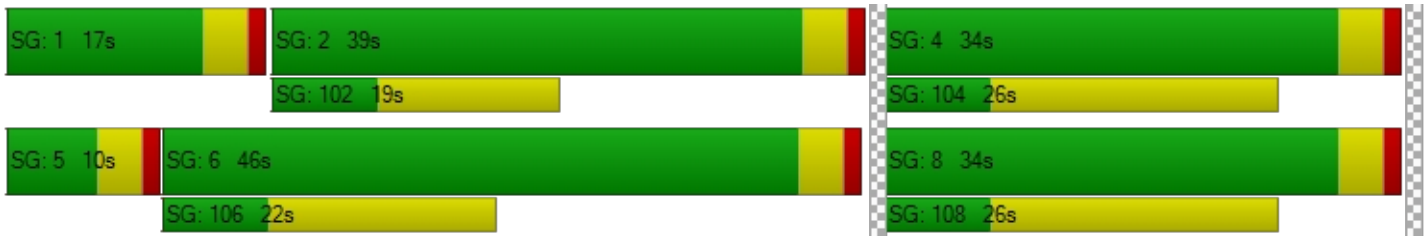
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 47.53 | 2.06 | 2.06 | 53.35 | 2.56 | 2.56 | 41.11 | 44.89 | 44.89 | 0.00 | 0.00 | 0.00 |
| Movement LOS | D | A | A | D | A | A | D | D | D | A | A | A |
| d_A, Approach Delay [s/veh] | 9.02 | | | 4.45 | | | 43.54 | | | 0.00 | | |
| Approach LOS | A | | | A | | | D | | | A | | |
| d_I, Intersection Delay [s/veh] | 15.20 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.105 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.374 | 2.417 | 1.987 | 1.946 |
| Crosswalk LOS | B | B | A | A |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 933 | 778 | 666 | 666 |
| d_b, Bicycle Delay [s] | 12.81 | 16.82 | 20.01 | 20.01 |
| l_b,int, Bicycle LOS Score for Intersection | 1.711 | 1.692 | 1.726 | 1.560 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 6.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | A |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.094 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 14 | 190 | 72 | 17 | 166 | 6 | 1 | 0 | 1 | 28 | 0 | 7 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 14 | 190 | 72 | 17 | 166 | 6 | 1 | 0 | 1 | 28 | 0 | 7 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 48 | 18 | 4 | 42 | 2 | 0 | 0 | 0 | 7 | 0 | 2 |
| Total Analysis Volume [veh/h] | 14 | 190 | 72 | 17 | 166 | 6 | 1 | 0 | 1 | 28 | 0 | 7 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 30 | 0 | 10 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 17 | 0 | 0 | 18 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | C | R | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 0.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 84 | 78 | 78 | 84 | 78 | 78 | 0 | 0 | 4 | 4 |
| g / C, Green / Cycle | 0.84 | 0.78 | 0.78 | 0.84 | 0.78 | 0.78 | 0.00 | 0.00 | 0.04 | 0.04 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.07 | 0.07 | 0.01 | 0.05 | 0.05 | 0.00 | 0.00 | 0.01 | 0.01 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 1589 | 1473 | 1473 | 1576 | 1479 | 1479 | 7 | 7 | 68 | 72 |
| d1, Uniform Delay [s] | 1.32 | 2.72 | 2.71 | 1.32 | 2.57 | 2.57 | 49.68 | 49.68 | 46.77 | 46.74 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.00 | 0.12 | 0.12 | 0.01 | 0.08 | 0.07 | 9.31 | 8.30 | 1.96 | 1.72 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.01 | 0.09 | 0.09 | 0.01 | 0.06 | 0.06 | 0.14 | 0.14 | 0.26 | 0.24 |
|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 1.32 | 2.84 | 2.83 | 1.33 | 2.65 | 2.65 | 58.99 | 57.98 | 48.73 | 48.46 |
| Lane Group LOS | A | A | A | A | A | A | E | E | D | D |
| Critical Lane Group | No | Yes | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.02 | 0.53 | 0.51 | 0.03 | 0.32 | 0.32 | 0.04 | 0.04 | 0.46 | 0.45 |
| 50th-Percentile Queue Length [ft/ln] | 0.59 | 13.30 | 12.64 | 0.82 | 8.11 | 8.07 | 1.07 | 1.04 | 11.51 | 11.36 |
| 95th-Percentile Queue Length [veh/ln] | 0.04 | 0.96 | 0.91 | 0.06 | 0.58 | 0.58 | 0.08 | 0.07 | 0.83 | 0.82 |
| 95th-Percentile Queue Length [ft/ln] | 1.05 | 23.94 | 22.75 | 1.48 | 14.60 | 14.53 | 1.92 | 1.87 | 20.71 | 20.44 |

**Movement, Approach, & Intersection Results**

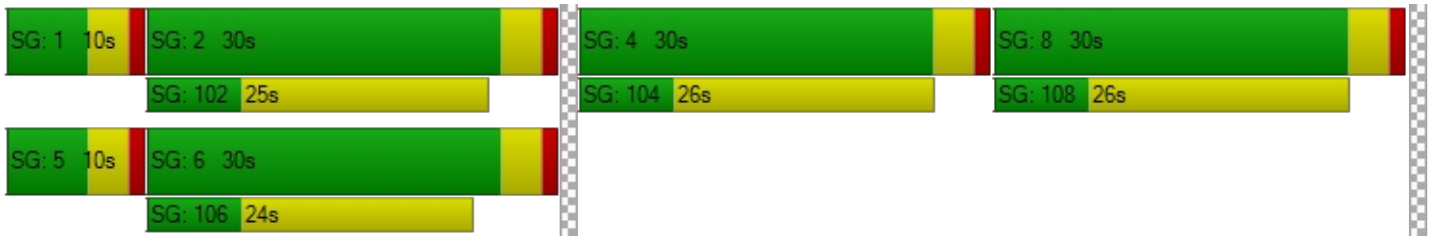
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 1.32 | 2.84 | 2.83 | 1.33 | 2.65 | 2.65 | 58.99 | 58.99 | 57.98 | 48.63 | 48.46 | 48.46 |
| Movement LOS | A | A | A | A | A | A | E | E | E | D | D | D |
| d_A, Approach Delay [s/veh] | 2.76 | | | 2.53 | | | 58.48 | | | 48.60 | | |
| Approach LOS | A | | | A | | | E | | | D | | |
| d_I, Intersection Delay [s/veh] | 6.09 | | | | | | | | | | | |
| Intersection LOS | A | | | | | | | | | | | |
| Intersection V/C | 0.094 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 39.62 | 39.62 | 39.62 | 39.62 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.397 | 2.380 | 1.968 | 2.005 |
| Crosswalk LOS | B | B | A | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 520 | 520 | 520 | 520 |
| d_b, Bicycle Delay [s] | 27.40 | 27.40 | 27.40 | 27.40 |
| l_b,int, Bicycle LOS Score for Intersection | 1.787 | 1.716 | 1.563 | 1.617 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 12.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.236 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 34 | 9 | 17 | 3 | 6 | 28 | 84 | 284 | 17 | 30 | 512 | 15 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 34 | 9 | 17 | 3 | 6 | 28 | 84 | 284 | 17 | 30 | 512 | 15 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 9 | 2 | 4 | 1 | 2 | 7 | 21 | 71 | 4 | 8 | 128 | 4 |
| Total Analysis Volume [veh/h] | 34 | 9 | 17 | 3 | 6 | 28 | 84 | 284 | 17 | 30 | 512 | 15 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 6 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 30 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 37 | 0 | 0 | 10 | 10 | 10 | 33 | 0 | 10 | 33 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 21 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | No | No | No | | No | No | |
| Maximum Recall | | No | | | No | No | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | No | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | C | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 5 | 5 | 5 | 4 | 4 | 22 | 5 | 62 | 62 | 3 | 60 | 60 |
| g / C, Green / Cycle | 0.05 | 0.05 | 0.05 | 0.04 | 0.04 | 0.24 | 0.06 | 0.69 | 0.69 | 0.04 | 0.67 | 0.67 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.02 | 0.01 | 0.00 | 0.00 | 0.01 | 0.02 | 0.08 | 0.08 | 0.02 | 0.14 | 0.14 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 1900 | 1900 |
| c, Capacity [veh/h] | 142 | 164 | 101 | 75 | 79 | 462 | 209 | 1313 | 1313 | 66 | 1270 | 1270 |
| d1, Uniform Delay [s] | 40.69 | 41.15 | 40.80 | 41.52 | 41.51 | 26.22 | 40.85 | 4.67 | 4.66 | 42.56 | 5.77 | 5.76 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.24 | 0.56 | 0.78 | 0.35 | 0.28 | 0.05 | 1.25 | 0.18 | 0.18 | 4.84 | 0.37 | 0.37 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.08 | 0.19 | 0.17 | 0.06 | 0.05 | 0.06 | 0.40 | 0.12 | 0.11 | 0.46 | 0.21 | 0.21 |
| d, Delay for Lane Group [s/veh] | 40.93 | 41.71 | 41.58 | 41.87 | 41.79 | 26.27 | 42.10 | 4.85 | 4.84 | 47.40 | 6.14 | 6.13 |
| Lane Group LOS | D | D | D | D | D | C | D | A | A | D | A | A |
| Critical Lane Group | No | Yes | No | No | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.25 | 0.69 | 0.38 | 0.11 | 0.10 | 0.46 | 0.93 | 0.85 | 0.84 | 0.74 | 1.78 | 1.77 |
| 50th-Percentile Queue Length [ft/ln] | 6.25 | 17.35 | 9.48 | 2.67 | 2.43 | 11.61 | 23.13 | 21.36 | 21.07 | 18.42 | 44.61 | 44.18 |
| 95th-Percentile Queue Length [veh/ln] | 0.45 | 1.25 | 0.68 | 0.19 | 0.17 | 0.84 | 1.67 | 1.54 | 1.52 | 1.33 | 3.21 | 3.18 |
| 95th-Percentile Queue Length [ft/ln] | 11.26 | 31.23 | 17.06 | 4.81 | 4.37 | 20.91 | 41.64 | 38.45 | 37.93 | 33.15 | 80.30 | 79.53 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 41.41 | 41.71 | 41.58 | 41.87 | 41.81 | 26.27 | 42.10 | 4.84 | 4.84 | 47.40 | 6.13 | 6.13 |
| Movement LOS | D | D | D | D | D | C | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 41.52 | | | 30.06 | | | 12.97 | | | 8.36 | | |
| Approach LOS | D | | | C | | | B | | | A | | |
| d_I, Intersection Delay [s/veh] | 12.76 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.236 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.72 | 34.72 | 0.00 | 34.72 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.321 | 2.328 | 0.000 | 2.467 |
| Crosswalk LOS | B | B | F | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 733 | 133 | 644 | 644 |
| d_b, Bicycle Delay [s] | 18.09 | 39.24 | 20.71 | 20.71 |
| l_b,int, Bicycle LOS Score for Intersection | 1.659 | 1.590 | 1.877 | 2.019 |
| Bicycle LOS | A | A | A | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 57.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | E |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.029 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 387 | 773 | 293 | 179 | 1484 | 334 | 303 | 1469 | 759 | 424 | 1315 | 275 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 387 | 773 | 293 | 179 | 1484 | 334 | 303 | 1469 | 759 | 424 | 1315 | 275 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 97 | 193 | 73 | 45 | 371 | 84 | 76 | 367 | 190 | 106 | 329 | 69 |
| Total Analysis Volume [veh/h] | 387 | 773 | 293 | 179 | 1484 | 334 | 303 | 1469 | 759 | 424 | 1315 | 275 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 16 | 43 | 0 | 12 | 39 | 0 | 16 | 47 | 0 | 18 | 49 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 31 | 0 | 0 | 28 | 0 | 0 | 31 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 12 | 38 | 38 | 8 | 34 | 34 | 12 | 44 | 44 | 14 | 46 | 46 |
| g / C, Green / Cycle | 0.10 | 0.32 | 0.32 | 0.07 | 0.28 | 0.28 | 0.10 | 0.37 | 0.37 | 0.12 | 0.38 | 0.38 |
| (v / s)_i Volume / Saturation Flow Rate | 0.11 | 0.14 | 0.15 | 0.05 | 0.26 | 0.18 | 0.09 | 0.39 | 0.40 | 0.12 | 0.23 | 0.14 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 351 | 1807 | 602 | 234 | 1617 | 539 | 351 | 1390 | 695 | 409 | 2180 | 727 |
| d1, Uniform Delay [s] | 54.00 | 32.40 | 33.11 | 55.06 | 41.64 | 37.36 | 53.19 | 38.06 | 38.06 | 53.00 | 29.75 | 26.76 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.16 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 56.06 | 0.16 | 0.61 | 5.11 | 2.52 | 1.77 | 6.35 | 40.62 | 61.88 | 30.76 | 1.25 | 1.50 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 1.10 | 0.43 | 0.49 | 0.76 | 0.92 | 0.62 | 0.86 | 1.06 | 1.09 | 1.04 | 0.60 | 0.38 |
| d, Delay for Lane Group [s/veh] | 110.06 | 32.56 | 33.72 | 60.16 | 44.15 | 39.13 | 59.54 | 78.68 | 99.94 | 83.76 | 30.99 | 28.26 |
| Lane Group LOS | F | C | C | E | D | D | E | F | F | F | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 8.02 | 5.95 | 6.98 | 2.83 | 14.40 | 8.76 | 4.81 | 27.88 | 31.98 | 7.90 | 10.35 | 6.00 |
| 50th-Percentile Queue Length [ft/ln] | 200.51 | 148.67 | 174.55 | 70.72 | 360.02 | 219.06 | 120.17 | 696.95 | 799.59 | 197.51 | 258.71 | 150.01 |
| 95th-Percentile Queue Length [veh/ln] | 13.14 | 9.95 | 11.32 | 5.09 | 20.62 | 13.62 | 8.40 | 37.98 | 43.86 | 12.69 | 15.62 | 10.02 |
| 95th-Percentile Queue Length [ft/ln] | 328.40 | 248.66 | 282.88 | 127.29 | 515.61 | 340.42 | 210.06 | 949.56 | 1096.48 | 317.36 | 390.60 | 250.45 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 110.06 | 32.56 | 33.72 | 60.16 | 44.15 | 39.13 | 59.54 | 78.68 | 99.94 | 83.76 | 30.99 | 28.26 |
| Movement LOS | F | C | C | E | D | D | E | E | F | F | C | C |
| d_A, Approach Delay [s/veh] | 53.43 | | | 44.75 | | | 82.76 | | | 41.73 | | |
| Approach LOS | D | | | D | | | F | | | D | | |
| d_I, Intersection Delay [s/veh] | 57.60 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |
| Intersection V/C | 1.029 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.51 | 49.51 | 49.51 | 49.51 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.309 | 3.226 | 3.296 | 3.291 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 650 | 583 | 717 | 750 |
| d_b, Bicycle Delay [s] | 27.34 | 30.11 | 24.71 | 23.44 |
| l_b,int, Bicycle LOS Score for Intersection | 2.359 | 2.658 | 2.952 | 2.667 |
| Bicycle LOS | B | B | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 21.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.662 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 64 | 124 | 166 | 295 | 121 | 263 | 246 | 1454 | 85 | 53 | 1559 | 193 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 64 | 124 | 166 | 295 | 121 | 263 | 246 | 1454 | 85 | 53 | 1559 | 193 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 16 | 31 | 42 | 74 | 30 | 66 | 62 | 364 | 21 | 13 | 390 | 48 |
| Total Analysis Volume [veh/h] | 64 | 124 | 166 | 295 | 121 | 263 | 246 | 1454 | 85 | 53 | 1559 | 193 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 39 | 0 | 0 | 39 | 0 | 17 | 30 | 0 | 21 | 34 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 23 | 0 | 0 | 17 | 0 | 0 | 23 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 18 | 18 | 18 | 18 | 18 | 18 | 13 | 56 | 56 | 4 | 47 | 47 |
| g / C, Green / Cycle | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.14 | 0.62 | 0.62 | 0.05 | 0.53 | 0.53 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.07 | 0.09 | 0.16 | 0.03 | 0.14 | 0.14 | 0.27 | 0.27 | 0.03 | 0.27 | 0.10 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 348 | 372 | 372 | 295 | 743 | 372 | 261 | 2360 | 1180 | 90 | 2999 | 1000 |
| d1, Uniform Delay [s] | 30.21 | 31.17 | 31.93 | 34.84 | 30.10 | 33.82 | 38.11 | 8.83 | 8.90 | 41.86 | 13.92 | 11.25 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.25 | 0.52 | 0.84 | 24.70 | 0.10 | 2.49 | 15.24 | 0.58 | 1.20 | 5.95 | 0.65 | 0.43 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.18 | 0.33 | 0.45 | 1.00 | 0.16 | 0.71 | 0.94 | 0.43 | 0.44 | 0.59 | 0.52 | 0.19 |
| d, Delay for Lane Group [s/veh] | 30.46 | 31.70 | 32.77 | 59.54 | 30.20 | 36.31 | 53.35 | 9.41 | 10.10 | 47.81 | 14.57 | 11.69 |
| Lane Group LOS | C | C | C | F | C | D | D | A | B | D | B | B |
| Critical Lane Group | No | No | No | Yes | No | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 1.17 | 2.34 | 3.22 | 8.09 | 1.09 | 5.52 | 6.38 | 4.76 | 5.10 | 1.29 | 6.58 | 2.04 |
| 50th-Percentile Queue Length [ft/ln] | 29.21 | 58.53 | 80.57 | 202.35 | 27.20 | 137.99 | 159.44 | 118.98 | 127.60 | 32.24 | 164.57 | 51.06 |
| 95th-Percentile Queue Length [veh/ln] | 2.10 | 4.21 | 5.80 | 12.77 | 1.96 | 9.37 | 10.52 | 8.34 | 8.81 | 2.32 | 10.79 | 3.68 |
| 95th-Percentile Queue Length [ft/ln] | 52.58 | 105.35 | 145.03 | 319.21 | 48.95 | 234.32 | 262.98 | 208.42 | 220.22 | 58.03 | 269.76 | 91.91 |

**Movement, Approach, & Intersection Results**

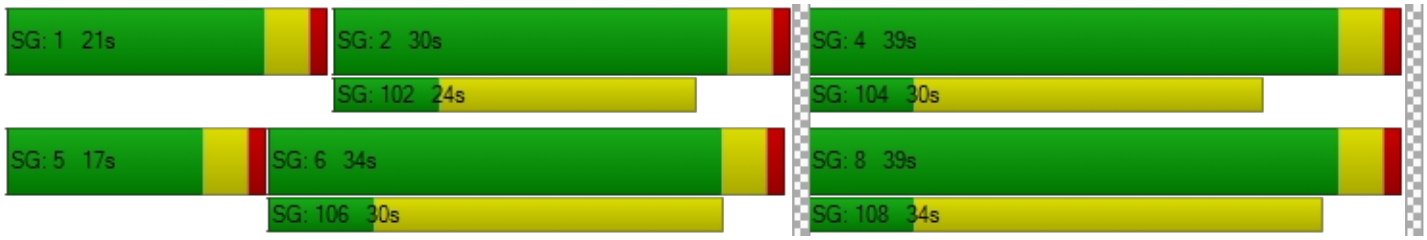
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 30.46 | 31.70 | 32.77 | 59.54 | 30.20 | 36.31 | 53.35 | 9.62 | 10.10 | 47.81 | 14.57 | 11.69 |
| Movement LOS | C | C | C | F | C | D | D | A | B | D | B | B |
| d_A, Approach Delay [s/veh] | 31.98 | | | 45.31 | | | 15.67 | | | 15.23 | | |
| Approach LOS | C | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 21.10 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.662 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.419 | 2.542 | 3.196 | 3.598 |
| Crosswalk LOS | B | B | C | D |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 778 | 778 | 578 | 666 |
| d_b, Bicycle Delay [s] | 16.82 | 16.82 | 22.77 | 20.01 |
| l_b,int, Bicycle LOS Score for Intersection | 2.144 | 2.120 | 2.541 | 2.552 |
| Bicycle LOS | B | B | B | B |

## Sequence

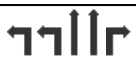
| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 46.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.943 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 473 | 581 | 189 | 181 | 1222 | 228 | 177 | 1689 | 395 | 210 | 1767 | 122 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 473 | 581 | 189 | 181 | 1222 | 228 | 177 | 1689 | 395 | 210 | 1767 | 122 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 118 | 145 | 47 | 45 | 306 | 57 | 44 | 422 | 99 | 53 | 442 | 31 |
| Total Analysis Volume [veh/h] | 473 | 581 | 189 | 181 | 1222 | 228 | 177 | 1689 | 395 | 210 | 1767 | 122 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 21 | 41 | 0 | 26 | 46 | 0 | 11 | 41 | 0 | 12 | 42 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 17 | 49 | 49 | 8 | 41 | 41 | 7 | 38 | 38 | 8 | 39 | 39 |
| g / C, Green / Cycle | 0.14 | 0.41 | 0.41 | 0.07 | 0.34 | 0.34 | 0.06 | 0.32 | 0.32 | 0.07 | 0.33 | 0.33 |
| (v / s)_i Volume / Saturation Flow Rate | 0.14 | 0.10 | 0.10 | 0.05 | 0.32 | 0.12 | 0.05 | 0.30 | 0.21 | 0.06 | 0.31 | 0.06 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 496 | 2345 | 782 | 247 | 1293 | 646 | 205 | 1810 | 603 | 235 | 1858 | 619 |
| d1, Uniform Delay [s] | 51.10 | 23.15 | 23.09 | 54.66 | 38.51 | 29.69 | 56.01 | 39.72 | 35.28 | 55.58 | 39.52 | 29.14 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 10.56 | 0.05 | 0.16 | 4.14 | 4.40 | 0.33 | 10.14 | 10.31 | 5.46 | 11.43 | 12.15 | 0.71 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.95 | 0.25 | 0.24 | 0.73 | 0.95 | 0.35 | 0.86 | 0.93 | 0.65 | 0.90 | 0.95 | 0.20 |
| d, Delay for Lane Group [s/veh] | 61.66 | 23.21 | 23.25 | 58.80 | 42.90 | 30.01 | 66.15 | 50.03 | 40.74 | 67.00 | 51.67 | 29.85 |
| Lane Group LOS | E | C | C | E | D | C | E | D | D | E | D | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 7.76 | 3.62 | 3.54 | 2.82 | 17.98 | 5.01 | 2.95 | 17.63 | 10.83 | 3.52 | 18.82 | 2.68 |
| 50th-Percentile Queue Length [ft/ln] | 194.09 | 90.43 | 88.58 | 70.61 | 449.62 | 125.14 | 73.65 | 440.76 | 270.66 | 88.12 | 470.47 | 66.93 |
| 95th-Percentile Queue Length [veh/ln] | 12.33 | 6.51 | 6.38 | 5.08 | 24.94 | 8.67 | 5.30 | 24.52 | 16.22 | 6.34 | 25.93 | 4.82 |
| 95th-Percentile Queue Length [ft/ln] | 308.32 | 162.77 | 159.45 | 127.09 | 623.50 | 216.87 | 132.58 | 612.91 | 405.57 | 158.62 | 648.33 | 120.48 |

**Movement, Approach, & Intersection Results**

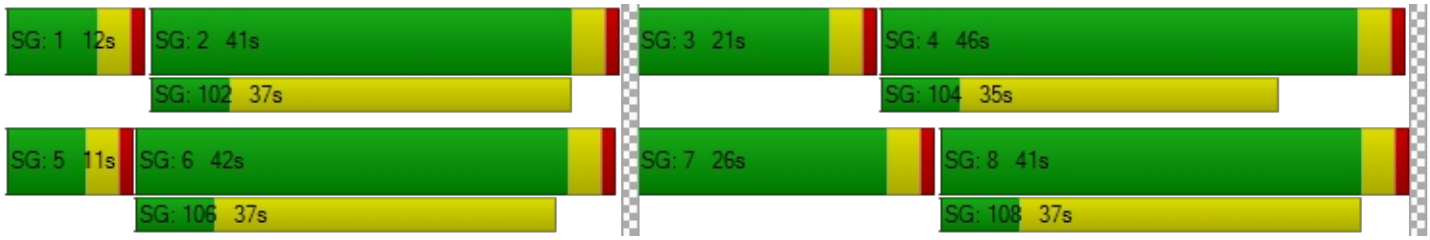
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 61.66 | 23.21 | 23.25 | 58.80 | 42.90 | 30.01 | 66.15 | 50.03 | 40.74 | 67.00 | 51.67 | 29.85 |
| Movement LOS | E | C | C | E | D | C | E | D | D | E | D | C |
| d_A, Approach Delay [s/veh] | 37.85 | | | 42.87 | | | 49.67 | | | 51.94 | | |
| Approach LOS | D | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 46.76 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.943 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.51 | 49.51 | 49.51 | 49.51 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.113 | 3.045 | 3.375 | 3.313 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 617 | 700 | 617 | 633 |
| d_b, Bicycle Delay [s] | 28.71 | 25.36 | 28.71 | 28.02 |
| l_b,int, Bicycle LOS Score for Intersection | 2.243 | 2.905 | 2.803 | 2.714 |
| Bicycle LOS | B | C | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 13.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.518 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 39 | 20 | 71 | 140 | 22 | 41 | 96 | 1742 | 27 | 43 | 1882 | 164 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 39 | 20 | 71 | 140 | 22 | 41 | 96 | 1742 | 27 | 43 | 1882 | 164 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 10 | 5 | 18 | 35 | 6 | 10 | 24 | 436 | 7 | 11 | 471 | 41 |
| Total Analysis Volume [veh/h] | 39 | 20 | 71 | 140 | 22 | 41 | 96 | 1742 | 27 | 43 | 1882 | 164 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 10 | 0 | 0 | 40 | 0 | 10 | 40 | 0 | 10 | 40 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 28 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 6 | 6 | 6 | 6 | 6 | 67 | 67 | 4 | 66 | 66 |
| g / C, Green / Cycle | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.67 | 0.67 | 0.04 | 0.66 | 0.66 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.01 | 0.04 | 0.04 | 0.03 | 0.03 | 0.31 | 0.32 | 0.02 | 0.33 | 0.09 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 3500 | 1900 | 3500 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 107 | 107 | 113 | 228 | 124 | 199 | 2557 | 1278 | 77 | 3757 | 1252 |
| d1, Uniform Delay [s] | 45.29 | 44.81 | 46.03 | 45.59 | 45.27 | 45.80 | 7.72 | 7.87 | 46.98 | 8.69 | 6.37 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 2.08 | 0.84 | 5.68 | 2.69 | 3.23 | 1.81 | 0.59 | 1.26 | 6.10 | 0.48 | 0.22 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.37 | 0.19 | 0.63 | 0.61 | 0.51 | 0.48 | 0.45 | 0.47 | 0.56 | 0.50 | 0.13 |
| d, Delay for Lane Group [s/veh] | 47.37 | 45.64 | 51.71 | 48.28 | 48.49 | 47.61 | 8.31 | 9.13 | 53.08 | 9.17 | 6.59 |
| Lane Group LOS | D | D | D | D | D | D | A | A | D | A | A |
| Critical Lane Group | No | No | Yes | Yes | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.99 | 0.50 | 1.89 | 1.77 | 1.62 | 1.20 | 5.38 | 5.94 | 1.18 | 6.31 | 1.25 |
| 50th-Percentile Queue Length [ft/ln] | 24.74 | 12.39 | 47.37 | 44.27 | 40.43 | 30.06 | 134.42 | 148.56 | 29.42 | 157.70 | 31.31 |
| 95th-Percentile Queue Length [veh/ln] | 1.78 | 0.89 | 3.41 | 3.19 | 2.91 | 2.16 | 9.18 | 9.94 | 2.12 | 10.43 | 2.25 |
| 95th-Percentile Queue Length [ft/ln] | 44.53 | 22.30 | 85.26 | 79.68 | 72.77 | 54.10 | 229.49 | 248.51 | 52.95 | 260.67 | 56.35 |

**Movement, Approach, & Intersection Results**

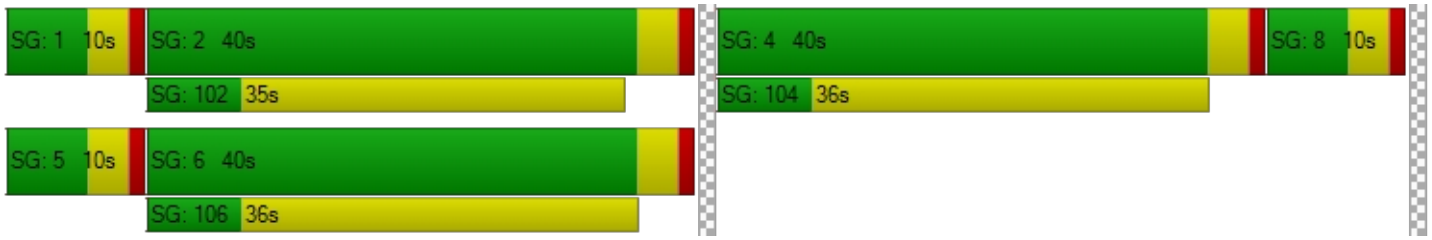
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 47.37 | 45.64 | 51.71 | 48.28 | 48.49 | 48.49 | 47.61 | 8.58 | 9.13 | 53.08 | 9.17 | 6.59 |
| Movement LOS | D | D | D | D | D | D | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 49.48 | | | 48.35 | | | 10.60 | | | 9.87 | | |
| Approach LOS | D | | | D | | | B | | | A | | |
| d_I, Intersection Delay [s/veh] | 13.21 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.518 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 39.64 | 39.64 | 39.64 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.190 | 2.399 | 3.197 | 0.000 |
| Crosswalk LOS | B | B | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 120 | 719 | 719 | 719 |
| d_b, Bicycle Delay [s] | 44.22 | 20.51 | 20.51 | 20.51 |
| l_b,int, Bicycle LOS Score for Intersection | 1.667 | 1.895 | 2.585 | 2.709 |
| Bicycle LOS | A | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 36.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.846 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 121 | 168 | 479 | 127 | 487 | 33 | 37 | 1734 | 204 | 534 | 1939 | 153 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 121 | 168 | 479 | 127 | 487 | 33 | 37 | 1734 | 204 | 534 | 1939 | 153 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 30 | 42 | 120 | 32 | 122 | 8 | 9 | 434 | 51 | 134 | 485 | 38 |
| Total Analysis Volume [veh/h] | 121 | 168 | 479 | 127 | 487 | 33 | 37 | 1734 | 204 | 534 | 1939 | 153 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 115 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 14 | 45 | 0 | 12 | 43 | 0 | 10 | 34 | 0 | 24 | 48 | 48 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 23 | 0 | 0 | 23 | 23 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 6 | 32 | 32 | 8 | 34 | 34 | 4 | 40 | 40 | 19 | 55 | 67 |
| g / C, Green / Cycle | 0.05 | 0.27 | 0.27 | 0.07 | 0.29 | 0.29 | 0.04 | 0.35 | 0.35 | 0.17 | 0.48 | 0.58 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.04 | 0.25 | 0.06 | 0.14 | 0.14 | 0.01 | 0.25 | 0.26 | 0.15 | 0.34 | 0.08 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 2000 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 182 | 1044 | 522 | 141 | 557 | 557 | 130 | 1978 | 659 | 592 | 2730 | 1109 |
| d1, Uniform Delay [s] | 53.58 | 31.67 | 40.48 | 53.11 | 33.37 | 33.26 | 53.92 | 32.86 | 33.16 | 46.88 | 23.68 | 10.83 |
| k, delay calibration | 0.11 | 0.11 | 0.25 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.16 | 0.07 | 13.85 | 18.28 | 0.62 | 0.60 | 1.19 | 2.41 | 7.65 | 5.42 | 1.60 | 0.26 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.67 | 0.16 | 0.92 | 0.90 | 0.47 | 0.46 | 0.28 | 0.73 | 0.75 | 0.90 | 0.71 | 0.14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 57.74 | 31.74 | 54.33 | 71.39 | 33.99 | 33.86 | 55.11 | 35.27 | 40.81 | 52.30 | 25.28 | 11.09 |
| Lane Group LOS | E | C | D | E | C | C | E | D | D | D | C | B |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 1.82 | 1.79 | 15.00 | 2.18 | 6.10 | 5.96 | 0.54 | 12.03 | 13.40 | 7.91 | 13.87 | 1.81 |
| 50th-Percentile Queue Length [ft/ln] | 45.59 | 44.84 | 375.10 | 54.41 | 152.48 | 148.98 | 13.58 | 300.63 | 334.98 | 197.63 | 346.72 | 45.27 |
| 95th-Percentile Queue Length [veh/ln] | 3.28 | 3.23 | 21.36 | 3.92 | 10.15 | 9.96 | 0.98 | 17.71 | 19.40 | 12.52 | 19.98 | 3.26 |
| 95th-Percentile Queue Length [ft/ln] | 82.07 | 80.71 | 533.92 | 97.94 | 253.74 | 249.06 | 24.44 | 442.81 | 485.06 | 312.90 | 499.41 | 81.48 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 57.74 | 31.74 | 54.33 | 71.39 | 33.93 | 33.86 | 55.11 | 36.20 | 40.81 | 52.30 | 25.28 | 11.09 |
| Movement LOS | E | C | D | E | C | C | E | D | D | D | C | B |
| d_A, Approach Delay [s/veh] | 49.93 | | | 41.28 | | | 37.03 | | | 29.95 | | |
| Approach LOS | D | | | D | | | D | | | C | | |
| d_I, Intersection Delay [s/veh] | 36.04 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.846 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 47.05 | 47.05 | 47.05 | 47.05 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.883 | 2.628 | 3.302 | 3.462 |
| Crosswalk LOS | C | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 713 | 678 | 522 | 765 |
| d_b, Bicycle Delay [s] | 23.83 | 25.13 | 31.43 | 21.93 |
| l_b,int, Bicycle LOS Score for Intersection | 2.193 | 2.093 | 2.374 | 3.004 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 15.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.678 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 684 | 0 | 562 | 0 | 1697 | 805 | 0 | 2168 | 232 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 684 | 0 | 562 | 0 | 1697 | 805 | 0 | 2168 | 232 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 171 | 0 | 141 | 0 | 424 | 201 | 0 | 542 | 58 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 684 | 0 | 562 | 0 | 1697 | 805 | 0 | 2168 | 232 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_di, Inbound Pedestrian Volume crossing m | | 0 | | | 0 | | | 0 | | | 0 | |
| v_co, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ci, Inbound Pedestrian Volume crossing mi | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ab, Corner Pedestrian Volume [ped/h] | | 0 | | | 0 | | | 0 | | | 0 | |
| Bicycle Volume [bicycles/h] | | 0 | | | 0 | | | 0 | | | 0 | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 8.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 64 | 0 | 0 | 0 | 26 | 0 | 0 | 26 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | | No | |
| Maximum Recall | | | | No | | | | No | | | No | |
| Pedestrian Recall | | | | No | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | C | R | C | C |
|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 26 | 26 | 26 | 56 | 56 |
| g / C, Green / Cycle | | 0.29 | 0.29 | 0.29 | 0.63 | 0.63 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.24 | 0.24 | 0.22 | 0.30 | 0.38 |
| s, saturation flow rate [veh/h] | | 1750 | 1750 | 1900 | 5700 | 5700 |
| c, Capacity [veh/h] | | 498 | 498 | 541 | 3570 | 3570 |
| d1, Uniform Delay [s] | | 30.14 | 30.14 | 29.41 | 8.93 | 10.12 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 3.73 | 3.73 | 2.33 | 0.46 | 0.78 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.83 | 0.83 | 0.77 | 0.48 | 0.61 |
| d, Delay for Lane Group [s/veh] | | 33.87 | 33.87 | 31.74 | 9.39 | 10.90 |
| Lane Group LOS | | C | C | C | A | B |
| Critical Lane Group | | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | | 8.67 | 8.67 | 8.31 | 5.36 | 7.79 |
| 50th-Percentile Queue Length [ft/ln] | | 216.69 | 216.69 | 207.64 | 133.89 | 194.82 |
| 95th-Percentile Queue Length [veh/ln] | | 13.50 | 13.50 | 13.03 | 9.15 | 12.37 |
| 95th-Percentile Queue Length [ft/ln] | | 337.39 | 337.39 | 325.80 | 228.78 | 309.28 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 33.87 | 0.00 | 32.30 | 0.00 | 9.39 | 0.00 | 0.00 | 10.90 | 0.00 |
| Movement LOS | | | | C | | C | | A | | | B | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 33.16 | | | 9.39 | | | 10.90 | | |
| Approach LOS | A | | | C | | | A | | | B | | |
| d_I, Intersection Delay [s/veh] | 15.82 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.678 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 0.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 0.00 | 34.63 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 0.000 | 2.434 | 0.000 | 0.000 |
| Crosswalk LOS | F | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 1335 | 489 | 489 |
| d_b, Bicycle Delay [s] | 44.96 | 4.98 | 25.65 | 25.65 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 3.616 | 2.493 | 2.752 |
| Bicycle LOS | D | D | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 25.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.678 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1125 | 31 | 949 | 0 | 0 | 86 | 98 | 1521 | 627 | 0 | 1721 | 14 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1125 | 31 | 949 | 0 | 0 | 86 | 98 | 1521 | 627 | 0 | 1721 | 14 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 281 | 8 | 237 | 0 | 0 | 22 | 25 | 380 | 157 | 0 | 430 | 4 |
| Total Analysis Volume [veh/h] | 1125 | 31 | 949 | 0 | 0 | 86 | 98 | 1521 | 627 | 0 | 1721 | 14 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 0 | 6 | 6 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 33 | 0 | 0 | 0 | 10 | 10 | 57 | 0 | 0 | 47 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | | No | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | | No | No | No | | | No | |
| Maximum Recall | | No | | | | No | No | No | | | No | |
| Pedestrian Recall | | No | | | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 29 | 29 | 29 | 6 | 6 | 53 | 43 | 43 |
| g / C, Green / Cycle | 0.32 | 0.32 | 0.32 | 0.07 | 0.07 | 0.59 | 0.48 | 0.48 |
| (v / s)_i Volume / Saturation Flow Rate | 0.30 | 0.31 | 0.28 | 0.02 | 0.05 | 0.27 | 0.23 | 0.23 |
| s, saturation flow rate [veh/h] | 3500 | 1750 | 1900 | 3800 | 1800 | 5700 | 5700 | 1900 |
| c, Capacity [veh/h] | 1126 | 563 | 611 | 261 | 124 | 3360 | 2715 | 905 |
| d1, Uniform Delay [s] | 29.44 | 29.82 | 28.82 | 39.98 | 41.32 | 10.36 | 16.01 | 16.01 |
| k, delay calibration | 0.11 | 0.39 | 0.34 | 0.11 | 0.11 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 3.64 | 22.98 | 11.39 | 0.73 | 10.79 | 0.44 | 0.61 | 1.82 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.92 | 0.95 | 0.87 | 0.33 | 0.79 | 0.45 | 0.48 | 0.48 |
| d, Delay for Lane Group [s/veh] | 33.09 | 52.80 | 40.21 | 40.71 | 52.11 | 10.80 | 16.62 | 17.82 |
| Lane Group LOS | C | D | D | D | D | B | B | B |
| Critical Lane Group | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 10.94 | 14.41 | 12.39 | 0.93 | 2.49 | 5.25 | 5.88 | 6.18 |
| 50th-Percentile Queue Length [ft/ln] | 273.59 | 360.35 | 309.79 | 23.14 | 62.21 | 131.16 | 147.03 | 154.62 |
| 95th-Percentile Queue Length [veh/ln] | 16.37 | 20.64 | 18.16 | 1.67 | 4.48 | 9.00 | 9.86 | 10.26 |
| 95th-Percentile Queue Length [ft/ln] | 409.22 | 516.00 | 454.11 | 41.65 | 111.98 | 225.07 | 246.46 | 256.58 |

**Movement, Approach, & Intersection Results**

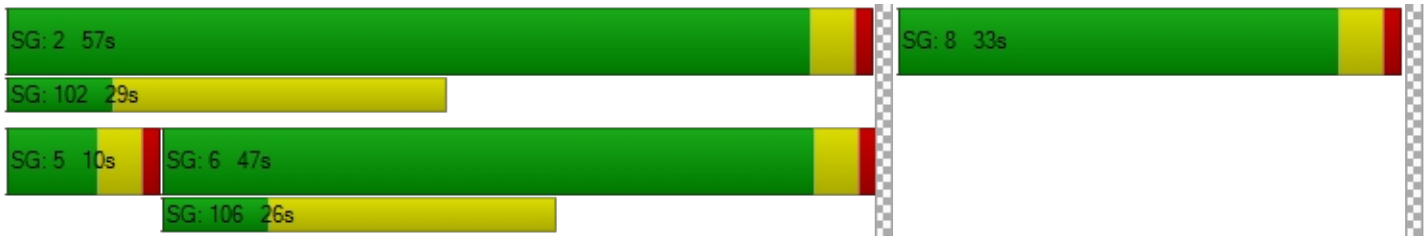
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 34.39 | 52.80 | 45.82 | 0.00 | 0.00 | 40.71 | 52.11 | 10.80 | 0.00 | 0.00 | 16.91 | 17.82 |
| Movement LOS | C | D | D | | | D | D | B | | | B | B |
| d_A, Approach Delay [s/veh] | 39.89 | | | 40.71 | | | 13.30 | | | 16.92 | | |
| Approach LOS | D | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 24.95 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.678 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.70 | 34.70 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.710 | 2.014 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 644 | 133 | 1177 | 955 |
| d_b, Bicycle Delay [s] | 20.69 | 39.22 | 7.62 | 12.29 |
| l_b,int, Bicycle LOS Score for Intersection | 5.033 | 1.560 | 2.450 | 2.275 |
| Bicycle LOS | F | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 33.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.839 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 168 | 241 | 94 | 190 | 382 | 183 | 237 | 2167 | 113 | 104 | 1792 | 112 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 168 | 241 | 94 | 190 | 382 | 183 | 237 | 2167 | 113 | 104 | 1792 | 112 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 42 | 60 | 24 | 48 | 96 | 46 | 59 | 542 | 28 | 26 | 448 | 28 |
| Total Analysis Volume [veh/h] | 168 | 241 | 94 | 190 | 382 | 183 | 237 | 2167 | 113 | 104 | 1792 | 112 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 110 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 10 | 39 | 0 | 14 | 43 | 0 | 21 | 45 | 0 | 12 | 36 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 29 | 0 | 0 | 26 | 0 | 0 | 25 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 23 | 23 | 8 | 25 | 25 | 16 | 55 | 55 | 8 | 47 | 47 |
| g / C, Green / Cycle | 0.05 | 0.21 | 0.21 | 0.07 | 0.23 | 0.23 | 0.15 | 0.50 | 0.50 | 0.07 | 0.43 | 0.43 |
| (v / s)_i Volume / Saturation Flow Rate | 0.05 | 0.09 | 0.08 | 0.05 | 0.20 | 0.10 | 0.13 | 0.40 | 0.41 | 0.06 | 0.25 | 0.26 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 194 | 395 | 395 | 255 | 428 | 428 | 267 | 1905 | 952 | 131 | 2426 | 809 |
| d1, Uniform Delay [s] | 51.60 | 38.03 | 37.75 | 50.03 | 41.35 | 36.55 | 45.98 | 22.64 | 23.21 | 50.23 | 24.12 | 24.60 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.14 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 11.07 | 0.77 | 0.68 | 4.28 | 8.38 | 0.68 | 9.64 | 3.40 | 7.76 | 10.30 | 1.02 | 3.48 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.87 | 0.44 | 0.41 | 0.74 | 0.89 | 0.43 | 0.89 | 0.79 | 0.82 | 0.79 | 0.58 | 0.61 |
| d, Delay for Lane Group [s/veh] | 62.67 | 38.80 | 38.43 | 54.31 | 49.72 | 37.23 | 55.62 | 26.04 | 30.97 | 60.53 | 25.14 | 28.07 |
| Lane Group LOS | E | D | D | D | D | D | E | C | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.59 | 4.17 | 3.83 | 2.71 | 10.94 | 4.29 | 7.04 | 16.20 | 18.34 | 3.19 | 9.35 | 10.64 |
| 50th-Percentile Queue Length [ft/ln] | 64.81 | 104.22 | 95.80 | 67.75 | 273.56 | 107.32 | 175.90 | 405.04 | 458.40 | 79.66 | 233.82 | 265.92 |
| 95th-Percentile Queue Length [veh/ln] | 4.67 | 7.50 | 6.90 | 4.88 | 16.37 | 7.69 | 11.39 | 22.80 | 25.36 | 5.74 | 14.37 | 15.99 |
| 95th-Percentile Queue Length [ft/ln] | 116.66 | 187.59 | 172.43 | 121.95 | 409.19 | 192.27 | 284.65 | 570.07 | 633.96 | 143.39 | 359.21 | 399.64 |

**Movement, Approach, & Intersection Results**

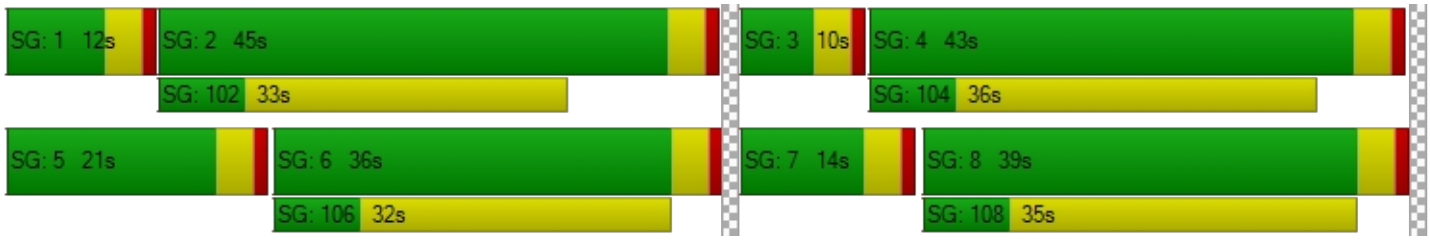
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 62.67 | 38.70 | 38.43 | 54.31 | 49.72 | 37.23 | 55.62 | 27.55 | 30.97 | 60.53 | 25.77 | 28.07 |
| Movement LOS | E | D | D | D | D | D | E | C | C | E | C | C |
| d_A, Approach Delay [s/veh] | 46.66 | | | 47.85 | | | 30.35 | | | 27.70 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 33.13 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.839 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 44.58 | 44.58 | 44.58 | 44.58 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.524 | 2.681 | 3.303 | 3.278 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 636 | 709 | 745 | 582 |
| d_b, Bicycle Delay [s] | 25.59 | 22.94 | 21.66 | 27.68 |
| l_b,int, Bicycle LOS Score for Intersection | 1.975 | 2.805 | 2.944 | 2.388 |
| Bicycle LOS | A | C | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 18.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.733 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 191 | 14 | 167 | 28 | 33 | 16 | 14 | 2152 | 478 | 201 | 1740 | 37 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 191 | 14 | 167 | 28 | 33 | 16 | 14 | 2152 | 478 | 201 | 1740 | 37 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 48 | 4 | 42 | 7 | 8 | 4 | 4 | 538 | 120 | 50 | 435 | 9 |
| Total Analysis Volume [veh/h] | 191 | 14 | 167 | 28 | 33 | 16 | 14 | 2152 | 478 | 201 | 1740 | 37 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 26 | 0 | 0 | 10 | 0 | 10 | 32 | 0 | 22 | 44 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 14 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 10 | 10 | 10 | 5 | 5 | 2 | 46 | 46 | 12 | 57 | 57 |
| g / C, Green / Cycle | 0.12 | 0.12 | 0.12 | 0.06 | 0.06 | 0.02 | 0.51 | 0.51 | 0.13 | 0.63 | 0.63 |
| (v / s)_i Volume / Saturation Flow Rate | 0.06 | 0.06 | 0.09 | 0.02 | 0.03 | 0.01 | 0.38 | 0.25 | 0.11 | 0.31 | 0.32 |
| s, saturation flow rate [veh/h] | 1750 | 1750 | 1900 | 1800 | 1900 | 1800 | 5700 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 204 | 204 | 222 | 105 | 110 | 38 | 2927 | 976 | 241 | 2381 | 1190 |
| d1, Uniform Delay [s] | 37.35 | 37.37 | 38.56 | 40.63 | 41.06 | 43.55 | 17.15 | 14.26 | 38.05 | 9.08 | 9.25 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.89 | 1.91 | 5.10 | 1.35 | 2.77 | 5.86 | 1.68 | 1.76 | 7.30 | 0.73 | 1.57 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.50 | 0.50 | 0.75 | 0.27 | 0.44 | 0.37 | 0.74 | 0.49 | 0.83 | 0.49 | 0.51 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 39.24 | 39.28 | 43.66 | 41.98 | 43.83 | 49.41 | 18.83 | 16.02 | 45.35 | 9.81 | 10.82 |
| Lane Group LOS | D | D | D | D | D | D | B | B | D | A | B |
| Critical Lane Group | No | No | Yes | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.19 | 2.21 | 3.83 | 0.63 | 1.13 | 0.37 | 11.12 | 6.39 | 4.74 | 5.66 | 6.27 |
| 50th-Percentile Queue Length [ft/ln] | 54.84 | 55.21 | 95.86 | 15.70 | 28.16 | 9.18 | 278.11 | 159.72 | 118.58 | 141.60 | 156.67 |
| 95th-Percentile Queue Length [veh/ln] | 3.95 | 3.98 | 6.90 | 1.13 | 2.03 | 0.66 | 16.59 | 10.53 | 8.31 | 9.57 | 10.37 |
| 95th-Percentile Queue Length [ft/ln] | 98.71 | 99.39 | 172.54 | 28.26 | 50.68 | 16.52 | 414.86 | 263.36 | 207.87 | 239.18 | 259.30 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 39.26 | 39.28 | 43.66 | 41.98 | 43.83 | 43.83 | 49.41 | 18.83 | 16.02 | 45.35 | 10.14 | 10.82 |
| Movement LOS | D | D | D | D | D | D | D | B | B | D | B | B |
| d_A, Approach Delay [s/veh] | 41.23 | | | 43.16 | | | 18.48 | | | 13.73 | | |
| Approach LOS | D | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 18.67 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.733 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.72 | 34.72 | 0.00 | 34.72 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.395 | 1.986 | 0.000 | 3.196 |
| Crosswalk LOS | B | A | F | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 488 | 133 | 622 | 888 |
| d_b, Bicycle Delay [s] | 25.73 | 39.24 | 21.40 | 13.92 |
| l_b,int, Bicycle LOS Score for Intersection | 2.173 | 1.687 | 3.014 | 2.648 |
| Bicycle LOS | B | A | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



Brea Mall Expansion, Brea

Vistro File: N:\...\4099 HCM Network.vistro
Report File: N:\...\PM 2045.pdf

Scenario 11 PM 2045
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | HCM 6th Edition | NB Left | 0.878 | 41.9 | D |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | HCM 6th Edition | WB Left | 0.667 | 19.3 | B |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | HCM 6th Edition | NB Left | 0.574 | 13.6 | B |
| 4 | Randolph Avenue at Birch Street | Signalized | HCM 6th Edition | NB Left | 0.541 | 21.8 | C |
| 5 | State College Boulevard at Birch Street | Signalized | HCM 6th Edition | NB Left | 0.870 | 37.7 | D |
| 6 | S Associated Road at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.760 | 28.9 | C |
| 7 | Randolph Avenue at Madison Way | Signalized | HCM 6th Edition | WB Left | 0.194 | 16.5 | B |
| 8 | Randolph Avenue at Brea Mall | Signalized | HCM 6th Edition | EB Left | 0.350 | 17.4 | B |
| 9 | Brea Mall South at State College Boulevard | Signalized | HCM 6th Edition | WB Left | 0.603 | 27.8 | C |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 1.041 | 69.8 | E |
| 11 | Puente Street at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.634 | 16.6 | B |
| 12 | Brea Boulevard at Imperial Highway | Signalized | HCM 6th Edition | NB Left | 0.878 | 41.4 | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.736 | 24.6 | C |
| 14 | State College Boulevard at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 1.067 | 69.4 | E |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.795 | 17.7 | B |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | HCM 6th Edition | EB Left | 0.806 | 26.1 | C |
| 17 | Associated Road at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.939 | 46.6 | D |
| 18 | Castlegate Lane/Placentia | Signalized | HCM 6th | EB Left | 0.845 | 28.1 | C |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | Edition | EB Left | 0.845 | 28.1 | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 41.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.878 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 368 | 685 | 345 | 637 | 455 | 17 | 44 | 1694 | 302 | 443 | 1361 | 801 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 368 | 685 | 345 | 637 | 455 | 17 | 44 | 1694 | 302 | 443 | 1361 | 801 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 92 | 171 | 86 | 159 | 114 | 4 | 11 | 424 | 76 | 111 | 340 | 200 |
| Total Analysis Volume [veh/h] | 368 | 685 | 345 | 637 | 455 | 17 | 44 | 1694 | 302 | 443 | 1361 | 801 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 17 | 34 | 0 | 27 | 44 | 0 | 10 | 39 | 0 | 20 | 49 | 49 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 28 | 0 | 0 | 22 | 22 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 13 | 26 | 26 | 26 | 23 | 36 | 36 | 5 | 39 | 39 | 16 | 51 | 78 |
| g / C, Green / Cycle | 0.11 | 0.21 | 0.21 | 0.21 | 0.19 | 0.30 | 0.30 | 0.04 | 0.33 | 0.33 | 0.13 | 0.42 | 0.65 |
| (v / s)_i Volume / Saturation Flow Rate | 0.11 | 0.19 | 0.19 | 0.17 | 0.18 | 0.12 | 0.12 | 0.01 | 0.26 | 0.26 | 0.13 | 0.24 | 0.42 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1900 | 3500 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 381 | 407 | 407 | 407 | 671 | 565 | 565 | 138 | 1864 | 621 | 468 | 2402 | 1228 |
| d1, Uniform Delay [s] | 53.28 | 45.72 | 45.60 | 44.43 | 47.94 | 33.89 | 33.83 | 56.11 | 36.89 | 36.82 | 51.58 | 26.40 | 12.97 |
| k, delay calibration | 0.11 | 0.27 | 0.27 | 0.20 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 14.78 | 14.41 | 13.18 | 5.81 | 7.99 | 0.50 | 0.49 | 1.32 | 3.80 | 10.39 | 10.30 | 0.97 | 2.70 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.97 | 0.88 | 0.87 | 0.77 | 0.95 | 0.42 | 0.42 | 0.32 | 0.80 | 0.80 | 0.95 | 0.57 | 0.65 |
| d, Delay for Lane Group [s/veh] | 68.06 | 60.13 | 58.78 | 50.24 | 55.93 | 34.39 | 34.32 | 57.43 | 40.69 | 47.22 | 61.88 | 27.38 | 15.67 |
| Lane Group LOS | E | E | E | D | E | C | C | E | D | D | E | C | B |
| Critical Lane Group | No | Yes | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 6.30 | 11.98 | 11.69 | 9.45 | 10.11 | 5.65 | 5.57 | 0.67 | 13.91 | 14.95 | 7.26 | 9.99 | 13.23 |
| 50th-Percentile Queue Length [ft/ln] | 157.5 | 299.4 | 292.1 | 236.3 | 252.87 | 141.35 | 139.34 | 16.87 | 347.65 | 373.81 | 181.62 | 249.63 | 330.70 |
| 95th-Percentile Queue Length [veh/ln] | 10.42 | 17.65 | 17.29 | 14.50 | 15.33 | 9.55 | 9.45 | 1.21 | 20.02 | 21.29 | 11.68 | 15.17 | 19.19 |
| 95th-Percentile Queue Length [ft/ln] | 260.4 | 441.3 | 432.3 | 362.4 | 383.27 | 238.84 | 236.13 | 30.37 | 500.55 | 532.35 | 292.12 | 379.18 | 479.81 |

**Movement, Approach, & Intersection Results**

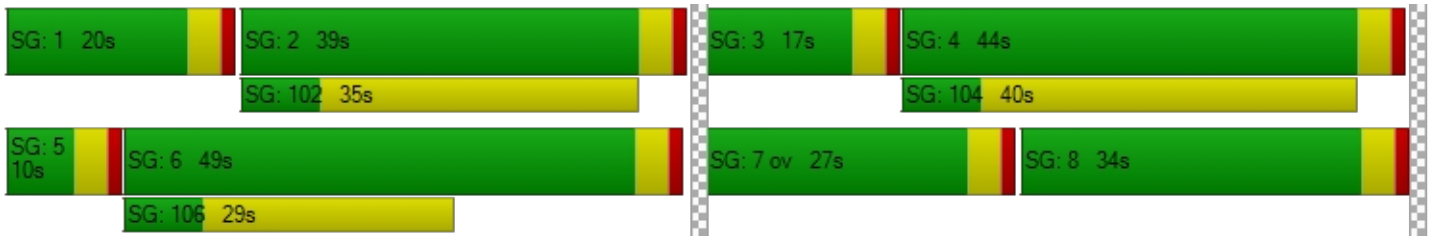
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 68.06 | 59.49 | 50.28 | 55.93 | 34.35 | 34.32 | 57.43 | 41.44 | 47.22 | 61.88 | 27.38 | 15.67 |
| Movement LOS | E | E | D | E | C | C | E | D | D | E | C | B |
| d_A, Approach Delay [s/veh] | 59.65 | | | 46.74 | | | 42.64 | | | 29.64 | | |
| Approach LOS | E | | | D | | | D | | | C | | |
| d_I, Intersection Delay [s/veh] | 41.87 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.878 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.970 | 2.895 | 3.273 | 0.000 |
| Crosswalk LOS | C | C | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 500 | 666 | 583 | 750 |
| d_b, Bicycle Delay [s] | 33.76 | 26.68 | 30.12 | 23.45 |
| l_b,int, Bicycle LOS Score for Intersection | 2.713 | 2.475 | 2.401 | 2.992 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 19.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.667 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 497 | 0 | 888 | 0 | 1508 | 877 | 280 | 1832 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 497 | 0 | 888 | 0 | 1508 | 877 | 280 | 1832 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 124 | 0 | 222 | 0 | 377 | 219 | 70 | 458 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 497 | 0 | 888 | 0 | 1508 | 877 | 280 | 1832 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 46 | 0 | 0 | 0 | 31 | 0 | 13 | 44 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 20 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | No | No | |
| Maximum Recall | | | | No | | | | No | | No | No | |
| Pedestrian Recall | | | | No | | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | R | C | R | L | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 26 | 26 | 43 | 43 | 9 | 56 |
| g / C, Green / Cycle | | 0.29 | 0.29 | 0.47 | 0.47 | 0.10 | 0.62 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.14 | 0.23 | 0.26 | 0.23 | 0.08 | 0.32 |
| s, saturation flow rate [veh/h] | | 3500 | 3800 | 5700 | 3800 | 3500 | 5700 |
| c, Capacity [veh/h] | | 1028 | 1116 | 2692 | 1795 | 353 | 3520 |
| d1, Uniform Delay [s] | | 26.18 | 29.31 | 17.05 | 16.30 | 39.57 | 9.71 |
| k, delay calibration | | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 0.35 | 1.34 | 0.85 | 0.95 | 4.06 | 0.55 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.48 | 0.80 | 0.56 | 0.49 | 0.79 | 0.52 |
| d, Delay for Lane Group [s/veh] | | 26.53 | 30.65 | 17.90 | 17.26 | 43.64 | 10.26 |
| Lane Group LOS | | C | C | B | B | D | B |
| Critical Lane Group | | No | Yes | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | | 4.33 | 8.77 | 7.25 | 6.11 | 3.18 | 6.19 |
| 50th-Percentile Queue Length [ft/ln] | | 108.29 | 219.30 | 181.28 | 152.74 | 79.59 | 154.76 |
| 95th-Percentile Queue Length [veh/ln] | | 7.75 | 13.63 | 11.67 | 10.16 | 5.73 | 10.27 |
| 95th-Percentile Queue Length [ft/ln] | | 193.63 | 340.73 | 291.69 | 254.08 | 143.26 | 256.77 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 26.53 | 0.00 | 30.65 | 0.00 | 17.90 | 17.26 | 43.64 | 10.26 | 0.00 |
| Movement LOS | | | | C | | C | | B | B | D | B | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 29.17 | | | 17.66 | | | 14.69 | | |
| Approach LOS | A | | | C | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 19.30 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.667 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.278 | 2.468 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 933 | 600 | 889 |
| d_b, Bicycle Delay [s] | 45.01 | 12.81 | 22.06 | 13.90 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 1.560 | 2.871 | 2.721 |
| Bicycle LOS | D | A | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 13.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.574 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | | | | No | | | No | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 710 | 0 | 330 | 0 | 0 | 0 | 0 | 1637 | 600 | 0 | 1199 | 571 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 710 | 0 | 330 | 0 | 0 | 0 | 0 | 1637 | 600 | 0 | 1199 | 571 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 178 | 0 | 83 | 0 | 0 | 0 | 0 | 409 | 150 | 0 | 300 | 0 |
| Total Analysis Volume [veh/h] | 710 | 0 | 330 | 0 | 0 | 0 | 0 | 1637 | 600 | 0 | 1199 | 0 |
| Presence of On-Street Parking | No | | No | | | | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 54 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 36 | 0 |
| Vehicle Extension [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | No | | | | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | | | | | | | No | | | No | |
| Maximum Recall | No | | | | | | | No | | | No | |
| Pedestrian Recall | No | | | | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | R | | C | C | R | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 22 | 22 | | 59 | 59 | 59 | 59 |
| g / C, Green / Cycle | 0.25 | 0.25 | | 0.66 | 0.66 | 0.66 | 0.66 |
| (v / s)_i Volume / Saturation Flow Rate | 0.20 | 0.17 | | 0.29 | 0.29 | 0.29 | 0.21 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | | 3800 | 1900 | 1900 | 5700 |
| c, Capacity [veh/h] | 873 | 474 | | 2514 | 1257 | 1257 | 3771 |
| d1, Uniform Delay [s] | 31.75 | 30.63 | | 7.29 | 7.29 | 7.29 | 6.51 |
| k, delay calibration | 0.11 | 0.11 | | 0.50 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.90 | 1.86 | | 0.57 | 1.14 | 1.14 | 0.22 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.81 | 0.70 | | 0.44 | 0.44 | 0.44 | 0.32 |
| d, Delay for Lane Group [s/veh] | 33.65 | 32.49 | | 7.86 | 8.43 | 8.43 | 6.74 |
| Lane Group LOS | C | C | | A | A | A | A |
| Critical Lane Group | Yes | No | | Yes | No | No | No |
| 50th-Percentile Queue Length [veh/ln] | 7.29 | 6.58 | | 4.62 | 4.82 | 4.82 | 2.90 |
| 50th-Percentile Queue Length [ft/ln] | 182.25 | 164.38 | | 115.52 | 120.50 | 120.50 | 72.53 |
| 95th-Percentile Queue Length [veh/ln] | 11.72 | 10.78 | | 8.15 | 8.42 | 8.42 | 5.22 |
| 95th-Percentile Queue Length [ft/ln] | 292.95 | 269.51 | | 203.66 | 210.51 | 210.51 | 130.55 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 33.65 | 0.00 | 32.49 | 0.00 | 0.00 | 0.00 | 0.00 | 7.91 | 8.43 | 0.00 | 6.74 | 0.00 |
| Movement LOS | C | | C | | | | | A | A | | A | |
| d_A, Approach Delay [s/veh] | 33.28 | | | 0.00 | | | 8.15 | | | 6.74 | | |
| Approach LOS | C | | | A | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 13.61 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.574 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 0.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.63 | 0.00 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.619 | 0.000 | 0.000 | 0.000 |
| Crosswalk LOS | B | F | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1112 | 0 | 712 | 712 |
| d_b, Bicycle Delay [s] | 8.86 | 44.96 | 18.65 | 18.65 |
| l_b,int, Bicycle LOS Score for Intersection | 1.560 | 4.132 | 2.790 | 2.219 |
| Bicycle LOS | A | D | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 21.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.541 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 143 | 75 | 186 | 55 | 53 | 112 | 93 | 770 | 103 | 206 | 1215 | 49 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 143 | 75 | 186 | 55 | 53 | 112 | 93 | 770 | 103 | 206 | 1215 | 49 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 36 | 19 | 47 | 14 | 13 | 28 | 23 | 193 | 26 | 52 | 304 | 12 |
| Total Analysis Volume [veh/h] | 143 | 75 | 186 | 55 | 53 | 112 | 93 | 770 | 103 | 206 | 1215 | 49 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 40 | 0 | 0 | 40 | 0 | 21 | 30 | 0 | 20 | 29 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 25 | 0 | 0 | 19 | 0 | 0 | 18 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 11 | 11 | 11 | 11 | 11 | 6 | 54 | 54 | 12 | 61 | 61 |
| g / C, Green / Cycle | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.07 | 0.60 | 0.60 | 0.14 | 0.67 | 0.67 |
| (v / s)_i Volume / Saturation Flow Rate | 0.08 | 0.04 | 0.10 | 0.03 | 0.09 | 0.05 | 0.23 | 0.22 | 0.11 | 0.32 | 0.03 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 131 | 242 | 242 | 214 | 242 | 124 | 1146 | 1146 | 245 | 2548 | 1274 |
| d1, Uniform Delay [s] | 36.97 | 35.70 | 38.01 | 35.37 | 37.55 | 41.19 | 9.27 | 9.16 | 37.96 | 7.19 | 5.02 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 65.37 | 0.72 | 5.06 | 0.63 | 3.35 | 8.79 | 1.00 | 0.93 | 7.55 | 0.64 | 0.06 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 1.10 | 0.31 | 0.77 | 0.26 | 0.68 | 0.75 | 0.39 | 0.37 | 0.84 | 0.48 | 0.04 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 102.35 | 36.42 | 43.07 | 36.00 | 40.90 | 49.98 | 10.27 | 10.09 | 45.51 | 7.83 | 5.08 |
| Lane Group LOS | F | D | D | D | D | D | B | B | D | A | A |
| Critical Lane Group | No | No | Yes | No | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 5.04 | 1.53 | 4.25 | 1.11 | 3.65 | 2.31 | 4.40 | 4.17 | 4.87 | 4.98 | 0.29 |
| 50th-Percentile Queue Length [ft/ln] | 125.96 | 38.20 | 106.20 | 27.81 | 91.25 | 57.65 | 110.05 | 104.16 | 121.82 | 124.53 | 7.19 |
| 95th-Percentile Queue Length [veh/ln] | 9.02 | 2.75 | 7.63 | 2.00 | 6.57 | 4.15 | 7.84 | 7.50 | 8.49 | 8.64 | 0.52 |
| 95th-Percentile Queue Length [ft/ln] | 225.47 | 68.77 | 190.71 | 50.07 | 164.25 | 103.77 | 196.07 | 187.49 | 212.33 | 216.03 | 12.95 |

**Movement, Approach, & Intersection Results**

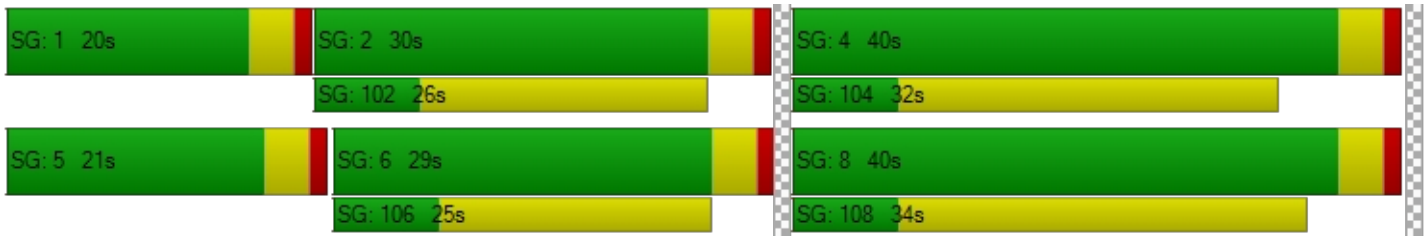
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 102.35 | 36.42 | 43.07 | 36.00 | 40.90 | 40.90 | 49.98 | 10.19 | 10.09 | 45.51 | 7.83 | 5.08 |
| Movement LOS | F | D | D | D | D | D | D | B | B | D | A | A |
| d_A, Approach Delay [s/veh] | 62.82 | | | 39.67 | | | 14.01 | | | 13.02 | | |
| Approach LOS | E | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 21.82 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.541 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.70 | 34.70 | 34.70 | 34.70 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.317 | 2.082 | 2.978 | 2.934 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 800 | 800 | 577 | 555 |
| d_b, Bicycle Delay [s] | 16.22 | 16.22 | 22.78 | 23.49 |
| l_b,int, Bicycle LOS Score for Intersection | 2.226 | 1.923 | 2.357 | 2.772 |
| Bicycle LOS | B | A | B | C |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 37.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.870 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 157 | 468 | 182 | 393 | 415 | 363 | 320 | 892 | 182 | 165 | 1138 | 749 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 157 | 468 | 182 | 393 | 415 | 363 | 320 | 892 | 182 | 165 | 1138 | 749 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 39 | 117 | 46 | 98 | 104 | 91 | 80 | 223 | 46 | 41 | 285 | 187 |
| Total Analysis Volume [veh/h] | 157 | 468 | 182 | 393 | 415 | 363 | 320 | 892 | 182 | 165 | 1138 | 749 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 115 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 10 | 39 | 0 | 23 | 52 | 0 | 16 | 42 | 0 | 11 | 37 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 19 | 19 | 15 | 28 | 28 | 12 | 58 | 58 | 7 | 53 | 53 |
| g / C, Green / Cycle | 0.05 | 0.17 | 0.17 | 0.13 | 0.25 | 0.25 | 0.10 | 0.50 | 0.50 | 0.06 | 0.46 | 0.46 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.12 | 0.10 | 0.11 | 0.22 | 0.19 | 0.09 | 0.23 | 0.10 | 0.05 | 0.30 | 0.39 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 3500 | 1900 | 1900 | 3500 | 3800 | 1900 | 3500 | 3800 | 1900 |
| c, Capacity [veh/h] | 185 | 635 | 317 | 463 | 468 | 468 | 367 | 1901 | 950 | 216 | 1736 | 868 |
| d1, Uniform Delay [s] | 54.03 | 45.54 | 44.16 | 48.81 | 41.83 | 40.41 | 50.74 | 18.79 | 15.90 | 53.18 | 24.23 | 28.02 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 10.14 | 1.70 | 1.64 | 4.44 | 6.03 | 2.80 | 6.47 | 0.83 | 0.45 | 5.58 | 1.95 | 11.06 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.85 | 0.74 | 0.57 | 0.85 | 0.89 | 0.78 | 0.87 | 0.47 | 0.19 | 0.77 | 0.66 | 0.86 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 64.17 | 47.23 | 45.79 | 53.25 | 47.85 | 43.21 | 57.22 | 19.62 | 16.35 | 58.76 | 26.18 | 39.08 |
| Lane Group LOS | E | D | D | D | D | D | E | B | B | E | C | D |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | 2.51 | 6.49 | 4.92 | 5.79 | 12.04 | 9.88 | 4.86 | 7.83 | 2.75 | 2.51 | 12.20 | 20.53 |
| 50th-Percentile Queue Length [ft/ln] | 62.80 | 162.16 | 123.09 | 144.68 | 301.11 | 247.02 | 121.52 | 195.80 | 68.68 | 62.87 | 305.09 | 513.21 |
| 95th-Percentile Queue Length [veh/ln] | 4.52 | 10.66 | 8.56 | 9.73 | 17.74 | 15.04 | 8.48 | 12.42 | 4.94 | 4.53 | 17.93 | 27.96 |
| 95th-Percentile Queue Length [ft/ln] | 113.05 | 266.59 | 214.07 | 243.31 | 443.41 | 375.89 | 211.91 | 310.54 | 123.62 | 113.17 | 448.32 | 698.98 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 64.17 | 47.23 | 45.79 | 53.25 | 47.85 | 43.21 | 57.22 | 19.62 | 16.35 | 58.76 | 26.18 | 39.08 |
| Movement LOS | E | D | D | D | D | D | E | B | B | E | C | D |
| d_A, Approach Delay [s/veh] | 50.20 | | | 48.23 | | | 27.82 | | | 33.51 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 37.71 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.870 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 47.05 | 47.05 | 47.05 | 47.05 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.824 | 2.905 | 3.031 | 3.096 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 608 | 834 | 661 | 574 |
| d_b, Bicycle Delay [s] | 27.84 | 19.53 | 25.80 | 29.25 |
| l_b,int, Bicycle LOS Score for Intersection | 2.225 | 2.526 | 2.710 | 3.253 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 28.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.760 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 559 | 37 | 403 | 11 | 23 | 11 | 17 | 1039 | 349 | 332 | 1466 | 19 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 559 | 37 | 403 | 11 | 23 | 11 | 17 | 1039 | 349 | 332 | 1466 | 19 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 140 | 9 | 101 | 3 | 6 | 3 | 4 | 260 | 87 | 83 | 367 | 5 |
| Total Analysis Volume [veh/h] | 559 | 37 | 403 | 11 | 23 | 11 | 17 | 1039 | 349 | 332 | 1466 | 19 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 6 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 30 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 28 | 65 | 65 | 0 | 37 | 0 | 10 | 38 | 0 | 17 | 45 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 7 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 26 | 0 | 26 | 0 | 0 | 27 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | No | | No | | No | No | | No | No | |
| Maximum Recall | No | No | No | | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | No | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 21 | 30 | 47 | 5 | 5 | 3 | 65 | 65 | 13 | 75 | 75 |
| g / C, Green / Cycle | 0.18 | 0.25 | 0.39 | 0.04 | 0.04 | 0.02 | 0.54 | 0.54 | 0.11 | 0.63 | 0.63 |
| (v / s)_i Volume / Saturation Flow Rate | 0.16 | 0.02 | 0.21 | 0.01 | 0.02 | 0.01 | 0.38 | 0.35 | 0.09 | 0.39 | 0.39 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 |
| c, Capacity [veh/h] | 624 | 477 | 747 | 77 | 75 | 40 | 1027 | 1027 | 380 | 1191 | 1191 |
| d1, Uniform Delay [s] | 48.21 | 34.34 | 28.07 | 55.73 | 56.40 | 57.94 | 20.39 | 19.57 | 52.69 | 13.72 | 13.71 |
| k, delay calibration | 0.11 | 0.11 | 0.34 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.83 | 0.07 | 1.90 | 0.84 | 4.29 | 7.10 | 3.97 | 3.22 | 6.36 | 2.47 | 2.46 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.90 | 0.08 | 0.54 | 0.14 | 0.46 | 0.43 | 0.70 | 0.65 | 0.87 | 0.62 | 0.62 |
| d, Delay for Lane Group [s/veh] | 53.04 | 34.41 | 29.98 | 56.57 | 60.69 | 65.04 | 24.36 | 22.78 | 59.05 | 16.19 | 16.17 |
| Lane Group LOS | D | C | C | E | E | E | C | C | E | B | B |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 8.57 | 0.84 | 9.28 | 0.34 | 1.10 | 0.59 | 15.49 | 13.75 | 5.26 | 12.45 | 12.43 |
| 50th-Percentile Queue Length [ft/ln] | 214.28 | 21.07 | 231.98 | 8.51 | 27.45 | 14.71 | 387.34 | 343.81 | 131.44 | 311.24 | 310.65 |
| 95th-Percentile Queue Length [veh/ln] | 13.37 | 1.52 | 14.27 | 0.61 | 1.98 | 1.06 | 21.95 | 19.83 | 9.02 | 18.24 | 18.21 |
| 95th-Percentile Queue Length [ft/ln] | 334.32 | 37.93 | 356.87 | 15.33 | 49.41 | 26.49 | 548.72 | 495.86 | 225.45 | 455.91 | 455.18 |

**Movement, Approach, & Intersection Results**

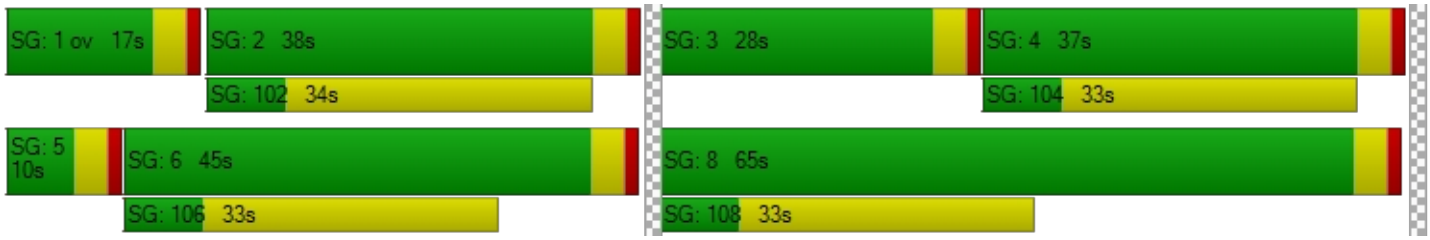
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 53.04 | 34.41 | 29.98 | 56.57 | 60.69 | 60.69 | 65.04 | 23.87 | 22.78 | 59.05 | 16.18 | 16.17 |
| Movement LOS | D | C | C | E | E | E | E | C | C | E | B | B |
| d_A, Approach Delay [s/veh] | 43.05 | | | 59.68 | | | 24.10 | | | 24.01 | | |
| Approach LOS | D | | | E | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 28.87 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.760 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.51 | 49.51 | 49.51 | 49.51 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.743 | 1.992 | 2.985 | 3.014 |
| Crosswalk LOS | B | A | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1017 | 550 | 567 | 683 |
| d_b, Bicycle Delay [s] | 14.51 | 31.54 | 30.82 | 26.01 |
| l_b,int, Bicycle LOS Score for Intersection | 3.208 | 1.634 | 2.719 | 3.059 |
| Bicycle LOS | C | A | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 16.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.194 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 48 | 361 | 45 | 29 | 273 | 32 | 68 | 4 | 55 | 79 | 4 | 38 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 48 | 361 | 45 | 29 | 273 | 32 | 68 | 4 | 55 | 79 | 4 | 38 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 12 | 90 | 11 | 7 | 68 | 8 | 17 | 1 | 14 | 20 | 1 | 10 |
| Total Analysis Volume [veh/h] | 48 | 361 | 45 | 29 | 273 | 32 | 68 | 4 | 55 | 79 | 4 | 38 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 25 | 50 | 0 | 10 | 35 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 12 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | L | C | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 4 | 69 | 69 | 3 | 68 | 68 | 6 | 6 | 6 | 6 |
| g / C, Green / Cycle | 0.05 | 0.77 | 0.77 | 0.04 | 0.76 | 0.76 | 0.06 | 0.06 | 0.06 | 0.06 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.11 | 0.11 | 0.02 | 0.08 | 0.08 | 0.04 | 0.03 | 0.04 | 0.02 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 86 | 1456 | 1456 | 64 | 1433 | 1433 | 126 | 123 | 110 | 123 |
| d1, Uniform Delay [s] | 41.94 | 2.76 | 2.75 | 42.56 | 2.96 | 2.96 | 40.91 | 40.63 | 41.17 | 40.26 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.56 | 0.20 | 0.20 | 4.91 | 0.15 | 0.15 | 3.57 | 2.85 | 8.36 | 1.62 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.56 | 0.14 | 0.14 | 0.45 | 0.11 | 0.11 | 0.54 | 0.48 | 0.72 | 0.34 |
| d, Delay for Lane Group [s/veh] | 47.50 | 2.96 | 2.95 | 47.47 | 3.12 | 3.11 | 44.48 | 43.48 | 49.53 | 41.87 |
| Lane Group LOS | D | A | A | D | A | A | D | D | D | D |
| Critical Lane Group | No | Yes | No | Yes | No | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 1.17 | 0.76 | 0.74 | 0.71 | 0.60 | 0.59 | 1.57 | 1.35 | 1.95 | 0.94 |
| 50th-Percentile Queue Length [ft/ln] | 29.14 | 19.00 | 18.41 | 17.84 | 15.09 | 14.75 | 39.36 | 33.67 | 48.77 | 23.41 |
| 95th-Percentile Queue Length [veh/ln] | 2.10 | 1.37 | 1.33 | 1.28 | 1.09 | 1.06 | 2.83 | 2.42 | 3.51 | 1.69 |
| 95th-Percentile Queue Length [ft/ln] | 52.45 | 34.19 | 33.13 | 32.12 | 27.16 | 26.54 | 70.84 | 60.61 | 87.79 | 42.14 |

**Movement, Approach, & Intersection Results**

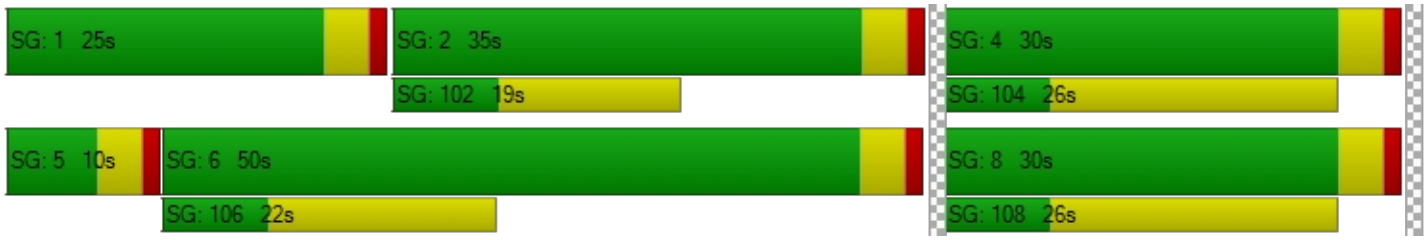
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 47.50 | 2.96 | 2.95 | 47.47 | 3.11 | 3.11 | 44.48 | 43.48 | 43.48 | 49.53 | 41.87 | 41.87 |
| Movement LOS | D | A | A | D | A | A | D | D | D | D | D | D |
| d_A, Approach Delay [s/veh] | 7.67 | | | 6.96 | | | 44.02 | | | 46.88 | | |
| Approach LOS | A | | | A | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 16.47 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.194 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.580 | 2.552 | 2.008 | 2.004 |
| Crosswalk LOS | B | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1022 | 689 | 578 | 578 |
| d_b, Bicycle Delay [s] | 10.76 | 19.35 | 22.77 | 22.77 |
| l_b,int, Bicycle LOS Score for Intersection | 1.934 | 1.835 | 1.769 | 1.759 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 17.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.350 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 17 | 367 | 338 | 39 | 392 | 21 | 18 | 3 | 12 | 288 | 3 | 48 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 17 | 367 | 338 | 39 | 392 | 21 | 18 | 3 | 12 | 288 | 3 | 48 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 92 | 85 | 10 | 98 | 5 | 5 | 1 | 3 | 72 | 1 | 12 |
| Total Analysis Volume [veh/h] | 17 | 367 | 338 | 39 | 392 | 21 | 18 | 3 | 12 | 288 | 3 | 48 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 29 | 0 | 10 | 29 | 0 | 0 | 30 | 0 | 0 | 31 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 17 | 0 | 0 | 18 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | C | R | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 0.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 72 | 64 | 64 | 72 | 66 | 66 | 4 | 4 | 12 | 12 |
| g / C, Green / Cycle | 0.72 | 0.64 | 0.64 | 0.72 | 0.66 | 0.66 | 0.04 | 0.04 | 0.12 | 0.12 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.19 | 0.18 | 0.02 | 0.11 | 0.11 | 0.01 | 0.01 | 0.10 | 0.09 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 1324 | 1221 | 1221 | 1243 | 1253 | 1253 | 66 | 70 | 217 | 229 |
| d1, Uniform Delay [s] | 3.88 | 7.92 | 7.77 | 3.93 | 6.51 | 6.50 | 46.99 | 46.73 | 42.79 | 42.42 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.00 | 0.63 | 0.56 | 0.05 | 0.29 | 0.28 | 2.73 | 1.16 | 6.41 | 4.40 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.01 | 0.30 | 0.28 | 0.03 | 0.17 | 0.16 | 0.32 | 0.17 | 0.79 | 0.73 |
|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 3.88 | 8.55 | 8.34 | 3.97 | 6.79 | 6.78 | 49.72 | 47.89 | 49.20 | 46.82 |
| Lane Group LOS | A | A | A | A | A | A | D | D | D | D |
| Critical Lane Group | No | Yes | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.08 | 3.41 | 3.08 | 0.21 | 1.63 | 1.60 | 0.56 | 0.31 | 4.49 | 4.23 |
| 50th-Percentile Queue Length [ft/ln] | 2.10 | 85.26 | 76.99 | 5.19 | 40.70 | 40.11 | 13.94 | 7.77 | 112.21 | 105.63 |
| 95th-Percentile Queue Length [veh/ln] | 0.15 | 6.14 | 5.54 | 0.37 | 2.93 | 2.89 | 1.00 | 0.56 | 7.96 | 7.60 |
| 95th-Percentile Queue Length [ft/ln] | 3.77 | 153.46 | 138.58 | 9.34 | 73.25 | 72.21 | 25.10 | 13.99 | 199.07 | 189.91 |

**Movement, Approach, & Intersection Results**

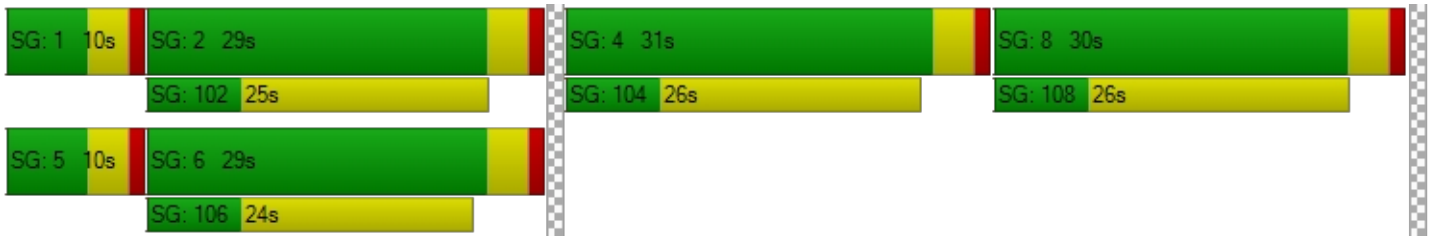
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 3.88 | 8.55 | 8.34 | 3.97 | 6.78 | 6.78 | 49.72 | 49.72 | 47.89 | 48.24 | 46.82 | 46.82 |
| Movement LOS | A | A | A | A | A | A | D | D | D | D | D | D |
| d_A, Approach Delay [s/veh] | 8.34 | | | 6.54 | | | 49.06 | | | 48.03 | | |
| Approach LOS | A | | | A | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 17.39 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.350 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 39.62 | 39.62 | 39.62 | 39.62 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.580 | 2.477 | 1.986 | 2.216 |
| Crosswalk LOS | B | B | A | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 500 | 500 | 520 | 540 |
| d_b, Bicycle Delay [s] | 28.14 | 28.14 | 27.40 | 26.66 |
| l_b,int, Bicycle LOS Score for Intersection | 2.155 | 1.933 | 1.614 | 2.119 |
| Bicycle LOS | B | A | A | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 27.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.603 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 151 | 26 | 67 | 45 | 20 | 402 | 519 | 596 | 23 | 104 | 490 | 28 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 151 | 26 | 67 | 45 | 20 | 402 | 519 | 596 | 23 | 104 | 490 | 28 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 38 | 7 | 17 | 11 | 5 | 101 | 130 | 149 | 6 | 26 | 123 | 7 |
| Total Analysis Volume [veh/h] | 151 | 26 | 67 | 45 | 20 | 402 | 519 | 596 | 23 | 104 | 490 | 28 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 110 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 6 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 30 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 37 | 0 | 0 | 10 | 10 | 31 | 31 | 0 | 32 | 32 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 21 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | No | No | No | | No | No | |
| Maximum Recall | | No | | | No | No | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | No | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | C | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 9 | 9 | 9 | 6 | 6 | 45 | 21 | 71 | 71 | 8 | 57 | 57 |
| g / C, Green / Cycle | 0.08 | 0.08 | 0.08 | 0.06 | 0.06 | 0.41 | 0.19 | 0.64 | 0.64 | 0.07 | 0.52 | 0.52 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.06 | 0.04 | 0.03 | 0.01 | 0.21 | 0.15 | 0.16 | 0.16 | 0.06 | 0.14 | 0.14 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 1900 | 1900 |
| c, Capacity [veh/h] | 189 | 209 | 159 | 101 | 107 | 773 | 680 | 1216 | 1216 | 135 | 989 | 989 |
| d1, Uniform Delay [s] | 47.93 | 49.39 | 47.95 | 50.35 | 49.61 | 24.60 | 42.01 | 8.55 | 8.53 | 50.04 | 14.67 | 14.64 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.29 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.01 | 2.23 | 1.76 | 3.05 | 0.84 | 1.44 | 1.82 | 0.51 | 0.50 | 8.90 | 0.65 | 0.64 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.33 | 0.55 | 0.42 | 0.45 | 0.19 | 0.52 | 0.76 | 0.26 | 0.25 | 0.77 | 0.26 | 0.26 |
| d, Delay for Lane Group [s/veh] | 48.94 | 51.62 | 49.71 | 53.40 | 50.45 | 26.04 | 43.83 | 9.06 | 9.03 | 58.94 | 15.33 | 15.27 |
| Lane Group LOS | D | D | D | D | D | C | D | A | A | E | B | B |
| Critical Lane Group | No | Yes | No | No | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 1.69 | 3.19 | 1.82 | 1.29 | 0.55 | 8.09 | 6.80 | 3.19 | 3.14 | 3.14 | 3.74 | 3.67 |
| 50th-Percentile Queue Length [ft/ln] | 42.20 | 79.86 | 45.58 | 32.15 | 13.76 | 202.28 | 169.92 | 79.66 | 78.45 | 78.51 | 93.61 | 91.81 |
| 95th-Percentile Queue Length [veh/ln] | 3.04 | 5.75 | 3.28 | 2.31 | 0.99 | 12.76 | 11.07 | 5.74 | 5.65 | 5.65 | 6.74 | 6.61 |
| 95th-Percentile Queue Length [ft/ln] | 75.96 | 143.74 | 82.05 | 57.87 | 24.77 | 318.90 | 276.81 | 143.38 | 141.20 | 141.32 | 168.49 | 165.26 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 50.44 | 51.62 | 49.71 | 53.40 | 50.45 | 26.04 | 43.83 | 9.04 | 9.03 | 58.94 | 15.30 | 15.27 |
| Movement LOS | D | D | D | D | D | C | D | A | A | E | B | B |
| d_A, Approach Delay [s/veh] | 50.40 | | | 29.73 | | | 24.91 | | | 22.60 | | |
| Approach LOS | D | | | C | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 27.75 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.603 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 44.60 | 44.60 | 0.00 | 44.60 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.386 | 2.512 | 0.000 | 2.569 |
| Crosswalk LOS | B | B | F | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 599 | 109 | 490 | 509 |
| d_b, Bicycle Delay [s] | 27.00 | 49.21 | 31.36 | 30.61 |
| l_b,int, Bicycle LOS Score for Intersection | 1.962 | 1.945 | 2.498 | 2.073 |
| Bicycle LOS | A | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 69.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | E |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.041 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 786 | 1305 | 282 | 288 | 1020 | 439 | 336 | 1361 | 417 | 455 | 1692 | 299 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 786 | 1305 | 282 | 288 | 1020 | 439 | 336 | 1361 | 417 | 455 | 1692 | 299 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 197 | 326 | 71 | 72 | 255 | 110 | 84 | 340 | 104 | 114 | 423 | 75 |
| Total Analysis Volume [veh/h] | 786 | 1305 | 282 | 288 | 1020 | 439 | 336 | 1361 | 417 | 455 | 1692 | 299 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 24 | 47 | 0 | 16 | 39 | 0 | 16 | 42 | 0 | 15 | 41 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 31 | 0 | 0 | 28 | 0 | 0 | 31 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 20 | 40 | 40 | 12 | 31 | 31 | 12 | 41 | 41 | 11 | 40 | 40 |
| g / C, Green / Cycle | 0.17 | 0.33 | 0.33 | 0.10 | 0.26 | 0.26 | 0.10 | 0.35 | 0.35 | 0.09 | 0.34 | 0.34 |
| (v / s)_i Volume / Saturation Flow Rate | 0.22 | 0.23 | 0.15 | 0.08 | 0.18 | 0.23 | 0.10 | 0.32 | 0.30 | 0.13 | 0.30 | 0.16 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 585 | 1883 | 628 | 346 | 1494 | 498 | 354 | 1310 | 655 | 325 | 1918 | 639 |
| d1, Uniform Delay [s] | 50.02 | 34.93 | 31.63 | 53.15 | 39.84 | 42.54 | 53.69 | 37.74 | 36.93 | 54.49 | 37.60 | 31.37 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.31 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 157.17 | 0.46 | 0.50 | 5.23 | 0.56 | 13.24 | 13.16 | 11.79 | 15.21 | 184.43 | 6.27 | 2.45 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 1.34 | 0.69 | 0.45 | 0.83 | 0.68 | 0.88 | 0.95 | 0.92 | 0.88 | 1.40 | 0.88 | 0.47 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 207.19 | 35.40 | 32.13 | 58.38 | 40.40 | 55.78 | 66.85 | 49.53 | 52.15 | 238.92 | 43.87 | 33.82 |
| Lane Group LOS | F | D | C | E | D | E | E | D | D | F | D | C |
| Critical Lane Group | Yes | No | No | No | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 21.52 | 11.04 | 6.52 | 4.52 | 9.07 | 14.23 | 5.69 | 18.85 | 18.35 | 13.22 | 16.54 | 7.26 |
| 50th-Percentile Queue Length [ft/ln] | 537.88 | 276.06 | 163.05 | 112.94 | 226.76 | 355.74 | 142.13 | 471.28 | 458.63 | 330.60 | 413.43 | 181.44 |
| 95th-Percentile Queue Length [veh/ln] | 33.12 | 16.49 | 10.71 | 8.00 | 14.01 | 20.42 | 9.60 | 25.97 | 25.37 | 21.43 | 23.21 | 11.68 |
| 95th-Percentile Queue Length [ft/ln] | 828.09 | 412.30 | 267.76 | 200.08 | 350.24 | 510.41 | 239.89 | 649.30 | 634.24 | 535.79 | 580.16 | 291.90 |

**Movement, Approach, & Intersection Results**

| d_M, Delay for Movement [s/veh] | 207.19 | 35.40 | 32.13 | 58.38 | 40.40 | 55.78 | 66.85 | 49.83 | 52.15 | 238.92 | 43.87 | 33.82 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | F | D | C | E | D | E | E | D | D | F | D | C |
| d_A, Approach Delay [s/veh] | 91.91 | | | 47.23 | | | 52.99 | | | 78.92 | | |
| Approach LOS | F | | | D | | | D | | | E | | |
| d_I, Intersection Delay [s/veh] | 69.78 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |
| Intersection V/C | 1.041 | | | | | | | | | | | |

**Other Modes**

| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
|---|---|---|---|---|
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.325 | 3.262 | 3.352 | 3.337 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 716 | 583 | 633 | 616 |
| d_b, Bicycle Delay [s] | 24.73 | 30.13 | 28.04 | 28.73 |
| l_b,int, Bicycle LOS Score for Intersection | 2.865 | 2.520 | 2.722 | 2.905 |
| Bicycle LOS | C | B | B | C |

## Sequence

| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 16.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.634 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 38 | 51 | 89 | 236 | 113 | 228 | 146 | 1702 | 40 | 112 | 1921 | 399 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 38 | 51 | 89 | 236 | 113 | 228 | 146 | 1702 | 40 | 112 | 1921 | 399 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 10 | 13 | 22 | 59 | 28 | 57 | 37 | 426 | 10 | 28 | 480 | 100 |
| Total Analysis Volume [veh/h] | 38 | 51 | 89 | 236 | 113 | 228 | 146 | 1702 | 40 | 112 | 1921 | 399 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 38 | 0 | 0 | 38 | 0 | 18 | 41 | 0 | 11 | 34 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 23 | 0 | 0 | 17 | 0 | 0 | 23 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 15 | 15 | 15 | 15 | 15 | 15 | 9 | 56 | 56 | 7 | 54 | 54 |
| g / C, Green / Cycle | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.10 | 0.63 | 0.63 | 0.08 | 0.60 | 0.60 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.03 | 0.05 | 0.13 | 0.03 | 0.12 | 0.08 | 0.30 | 0.31 | 0.06 | 0.34 | 0.21 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 293 | 309 | 309 | 298 | 617 | 309 | 183 | 2374 | 1187 | 143 | 3435 | 1145 |
| d1, Uniform Delay [s] | 32.28 | 32.47 | 33.15 | 36.36 | 32.56 | 35.91 | 39.56 | 9.09 | 9.24 | 40.69 | 10.73 | 9.01 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.20 | 0.25 | 0.51 | 4.73 | 0.14 | 3.46 | 7.71 | 0.71 | 1.52 | 8.90 | 0.66 | 0.84 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.13 | 0.17 | 0.29 | 0.79 | 0.18 | 0.74 | 0.80 | 0.48 | 0.50 | 0.78 | 0.56 | 0.35 |
| d, Delay for Lane Group [s/veh] | 32.47 | 32.72 | 33.66 | 41.10 | 32.71 | 39.36 | 47.27 | 9.79 | 10.76 | 49.59 | 11.39 | 9.84 |
| Lane Group LOS | C | C | C | D | C | D | D | A | B | D | B | A |
| Critical Lane Group | No | No | No | Yes | No | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.72 | 0.97 | 1.73 | 5.30 | 1.06 | 4.98 | 3.51 | 5.54 | 6.11 | 2.76 | 7.00 | 3.82 |
| 50th-Percentile Queue Length [ft/ln] | 17.94 | 24.22 | 43.29 | 132.53 | 26.62 | 124.49 | 87.67 | 138.60 | 152.87 | 69.05 | 174.97 | 95.41 |
| 95th-Percentile Queue Length [veh/ln] | 1.29 | 1.74 | 3.12 | 9.08 | 1.92 | 8.64 | 6.31 | 9.41 | 10.17 | 4.97 | 11.34 | 6.87 |
| 95th-Percentile Queue Length [ft/ln] | 32.30 | 43.59 | 77.92 | 226.93 | 47.91 | 215.98 | 157.81 | 235.14 | 254.25 | 124.29 | 283.44 | 171.74 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 32.47 | 32.72 | 33.66 | 41.10 | 32.71 | 39.36 | 47.27 | 10.11 | 10.76 | 49.59 | 11.39 | 9.84 |
| Movement LOS | C | C | C | D | C | D | D | B | B | D | B | A |
| d_A, Approach Delay [s/veh] | 33.14 | | | 38.77 | | | 13.00 | | | 12.90 | | |
| Approach LOS | C | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 16.59 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.634 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.70 | 34.70 | 34.70 | 34.70 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.386 | 2.528 | 3.215 | 3.604 |
| Crosswalk LOS | B | B | C | D |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 755 | 755 | 822 | 666 |
| d_b, Bicycle Delay [s] | 17.44 | 17.44 | 15.63 | 20.02 |
| l_b,int, Bicycle LOS Score for Intersection | 1.853 | 2.036 | 2.598 | 2.897 |
| Bicycle LOS | A | B | B | C |

## Sequence

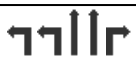
| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 41.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.878 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 553 | 989 | 298 | 277 | 712 | 234 | 263 | 1927 | 455 | 270 | 1872 | 207 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 553 | 989 | 298 | 277 | 712 | 234 | 263 | 1927 | 455 | 270 | 1872 | 207 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 138 | 247 | 75 | 69 | 178 | 59 | 66 | 482 | 114 | 68 | 468 | 52 |
| Total Analysis Volume [veh/h] | 553 | 989 | 298 | 277 | 712 | 234 | 263 | 1927 | 455 | 270 | 1872 | 207 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 23 | 47 | 0 | 15 | 39 | 0 | 14 | 44 | 0 | 14 | 44 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 19 | 34 | 34 | 11 | 26 | 26 | 10 | 49 | 49 | 10 | 49 | 49 |
| g / C, Green / Cycle | 0.16 | 0.28 | 0.28 | 0.09 | 0.22 | 0.22 | 0.08 | 0.41 | 0.41 | 0.08 | 0.41 | 0.41 |
| (v / s)_i Volume / Saturation Flow Rate | 0.16 | 0.17 | 0.16 | 0.08 | 0.19 | 0.12 | 0.08 | 0.34 | 0.24 | 0.08 | 0.33 | 0.11 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 556 | 1606 | 535 | 325 | 820 | 410 | 296 | 2324 | 775 | 296 | 2324 | 775 |
| d1, Uniform Delay [s] | 50.47 | 37.49 | 36.75 | 53.68 | 45.46 | 42.13 | 54.43 | 31.84 | 27.71 | 54.54 | 31.38 | 23.65 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 16.48 | 0.39 | 0.91 | 6.33 | 2.99 | 1.25 | 8.91 | 3.59 | 3.25 | 10.76 | 3.10 | 0.85 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.99 | 0.62 | 0.56 | 0.85 | 0.87 | 0.57 | 0.89 | 0.83 | 0.59 | 0.91 | 0.81 | 0.27 |
| d, Delay for Lane Group [s/veh] | 66.95 | 37.87 | 37.65 | 60.01 | 48.45 | 43.39 | 63.34 | 35.43 | 30.96 | 65.30 | 34.48 | 24.50 |
| Lane Group LOS | E | D | D | E | D | D | E | D | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 9.54 | 8.46 | 7.58 | 4.41 | 10.54 | 6.35 | 4.30 | 17.11 | 10.77 | 4.49 | 16.31 | 4.09 |
| 50th-Percentile Queue Length [ft/ln] | 238.52 | 211.49 | 189.50 | 110.13 | 263.44 | 158.87 | 107.50 | 427.82 | 269.33 | 112.23 | 407.80 | 102.34 |
| 95th-Percentile Queue Length [veh/ln] | 14.61 | 13.23 | 12.10 | 7.85 | 15.86 | 10.49 | 7.70 | 23.90 | 16.16 | 7.96 | 22.94 | 7.37 |
| 95th-Percentile Queue Length [ft/ln] | 365.16 | 330.74 | 302.38 | 196.18 | 396.54 | 262.23 | 192.52 | 597.43 | 403.90 | 199.10 | 573.39 | 184.21 |

**Movement, Approach, & Intersection Results**

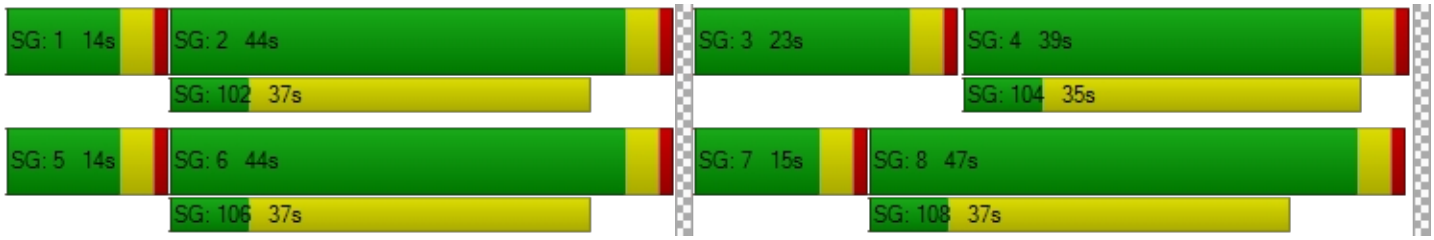
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 66.95 | 37.87 | 37.65 | 60.01 | 48.45 | 43.39 | 63.34 | 35.43 | 30.96 | 65.30 | 34.48 | 24.50 |
| Movement LOS | E | D | D | E | D | D | E | D | C | E | C | C |
| d_A, Approach Delay [s/veh] | 46.58 | | | 50.10 | | | 37.44 | | | 37.14 | | |
| Approach LOS | D | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 41.36 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.878 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.139 | 3.066 | 3.438 | 3.389 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 716 | 583 | 666 | 666 |
| d_b, Bicycle Delay [s] | 24.73 | 30.13 | 26.69 | 26.69 |
| l_b,int, Bicycle LOS Score for Intersection | 2.572 | 2.569 | 3.014 | 2.852 |
| Bicycle LOS | B | B | C | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 24.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.736 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 61 | 41 | 72 | 350 | 32 | 230 | 270 | 1903 | 47 | 77 | 2114 | 356 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 61 | 41 | 72 | 350 | 32 | 230 | 270 | 1903 | 47 | 77 | 2114 | 356 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 15 | 10 | 18 | 88 | 8 | 58 | 68 | 476 | 12 | 19 | 529 | 89 |
| Total Analysis Volume [veh/h] | 61 | 41 | 72 | 350 | 32 | 230 | 270 | 1903 | 47 | 77 | 2114 | 356 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 105 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 10 | 0 | 0 | 41 | 0 | 14 | 44 | 0 | 10 | 40 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 28 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 6 | 6 | 18 | 18 | 10 | 59 | 59 | 6 | 55 | 55 |
| g / C, Green / Cycle | 0.06 | 0.06 | 0.06 | 0.17 | 0.17 | 0.10 | 0.56 | 0.56 | 0.06 | 0.52 | 0.52 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.03 | 0.04 | 0.10 | 0.14 | 0.08 | 0.34 | 0.35 | 0.04 | 0.37 | 0.19 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 3500 | 1900 | 3500 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 108 | 108 | 114 | 592 | 321 | 334 | 2139 | 1069 | 100 | 2982 | 994 |
| d1, Uniform Delay [s] | 47.79 | 47.81 | 48.27 | 40.32 | 42.09 | 46.60 | 15.16 | 15.48 | 48.95 | 19.00 | 14.71 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 3.14 | 3.22 | 5.66 | 0.95 | 5.03 | 4.64 | 1.25 | 2.75 | 11.47 | 1.45 | 1.01 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.47 | 0.48 | 0.63 | 0.59 | 0.82 | 0.81 | 0.60 | 0.62 | 0.77 | 0.71 | 0.36 |
| d, Delay for Lane Group [s/veh] | 50.93 | 51.03 | 53.94 | 41.26 | 47.12 | 51.24 | 16.41 | 18.23 | 60.42 | 20.45 | 15.71 |
| Lane Group LOS | D | D | D | D | D | D | B | B | E | C | B |
| Critical Lane Group | No | No | Yes | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 1.37 | 1.39 | 2.02 | 4.23 | 6.94 | 3.66 | 9.89 | 10.94 | 2.31 | 12.72 | 5.10 |
| 50th-Percentile Queue Length [ft/ln] | 34.37 | 34.86 | 50.43 | 105.84 | 173.62 | 91.41 | 247.36 | 273.54 | 57.64 | 318.07 | 127.43 |
| 95th-Percentile Queue Length [veh/ln] | 2.47 | 2.51 | 3.63 | 7.61 | 11.27 | 6.58 | 15.05 | 16.37 | 4.15 | 18.57 | 8.80 |
| 95th-Percentile Queue Length [ft/ln] | 61.87 | 62.74 | 90.78 | 190.20 | 281.67 | 164.54 | 376.33 | 409.16 | 103.76 | 464.32 | 220.00 |

**Movement, Approach, & Intersection Results**

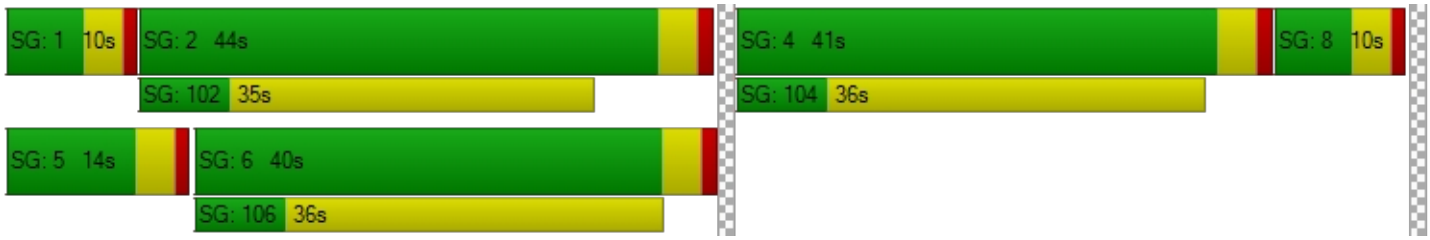
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 50.95 | 51.03 | 53.94 | 41.26 | 47.12 | 47.12 | 51.24 | 17.01 | 18.23 | 60.42 | 20.45 | 15.71 |
| Movement LOS | D | D | D | D | D | D | D | B | B | E | C | B |
| d_A, Approach Delay [s/veh] | 52.20 | | | 43.77 | | | 21.19 | | | 21.00 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 24.56 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.736 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 42.11 | 42.11 | 42.11 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.219 | 2.557 | 3.296 | 0.000 |
| Crosswalk LOS | B | B | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 114 | 704 | 761 | 685 |
| d_b, Bicycle Delay [s] | 46.70 | 22.05 | 20.14 | 22.70 |
| l_b,int, Bicycle LOS Score for Intersection | 1.703 | 2.569 | 2.781 | 2.960 |
| Bicycle LOS | A | B | C | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 69.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | E |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.067 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 385 | 628 | 471 | 464 | 331 | 103 | 118 | 2080 | 118 | 497 | 2038 | 518 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 385 | 628 | 471 | 464 | 331 | 103 | 118 | 2080 | 118 | 497 | 2038 | 518 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 96 | 157 | 118 | 116 | 83 | 26 | 30 | 520 | 30 | 124 | 510 | 130 |
| Total Analysis Volume [veh/h] | 385 | 628 | 471 | 464 | 331 | 103 | 118 | 2080 | 118 | 497 | 2038 | 518 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 29 | 41 | 0 | 27 | 39 | 0 | 11 | 34 | 0 | 18 | 41 | 41 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 23 | 0 | 0 | 23 | 23 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 16 | 33 | 33 | 23 | 40 | 40 | 6 | 34 | 34 | 14 | 42 | 69 |
| g / C, Green / Cycle | 0.13 | 0.27 | 0.27 | 0.19 | 0.33 | 0.33 | 0.05 | 0.29 | 0.29 | 0.12 | 0.35 | 0.58 |
| (v / s)_i Volume / Saturation Flow Rate | 0.11 | 0.17 | 0.25 | 0.23 | 0.12 | 0.11 | 0.03 | 0.28 | 0.30 | 0.14 | 0.36 | 0.27 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 2000 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 462 | 1036 | 518 | 384 | 632 | 632 | 177 | 1623 | 541 | 412 | 2005 | 1096 |
| d1, Uniform Delay [s] | 50.86 | 38.07 | 42.25 | 48.54 | 30.37 | 30.04 | 56.03 | 42.96 | 42.96 | 53.00 | 38.94 | 14.78 |
| k, delay calibration | 0.11 | 0.11 | 0.32 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.01 | 0.58 | 15.88 | 99.51 | 0.34 | 0.30 | 4.27 | 22.29 | 56.83 | 98.64 | 24.34 | 1.46 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.83 | 0.61 | 0.91 | 1.21 | 0.36 | 0.33 | 0.67 | 1.00 | 1.06 | 1.21 | 1.02 | 0.47 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 54.87 | 38.65 | 58.13 | 148.04 | 30.71 | 30.34 | 60.30 | 65.25 | 99.80 | 151.64 | 63.27 | 16.24 |
| Lane Group LOS | D | D | E | F | C | C | E | E | F | F | F | B |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 5.90 | 8.12 | 15.67 | 11.02 | 5.03 | 4.58 | 1.86 | 19.19 | 24.38 | 11.83 | 23.80 | 8.42 |
| 50th-Percentile Queue Length [ft/ln] | 147.46 | 203.10 | 391.79 | 275.54 | 125.72 | 114.39 | 46.60 | 479.76 | 609.61 | 295.80 | 595.04 | 210.54 |
| 95th-Percentile Queue Length [veh/ln] | 9.88 | 12.80 | 22.16 | 17.94 | 8.71 | 8.08 | 3.35 | 26.37 | 33.79 | 18.81 | 32.17 | 13.18 |
| 95th-Percentile Queue Length [ft/ln] | 247.03 | 319.97 | 554.10 | 448.51 | 217.66 | 202.09 | 83.87 | 659.36 | 844.78 | 470.30 | 804.36 | 329.52 |

**Movement, Approach, & Intersection Results**

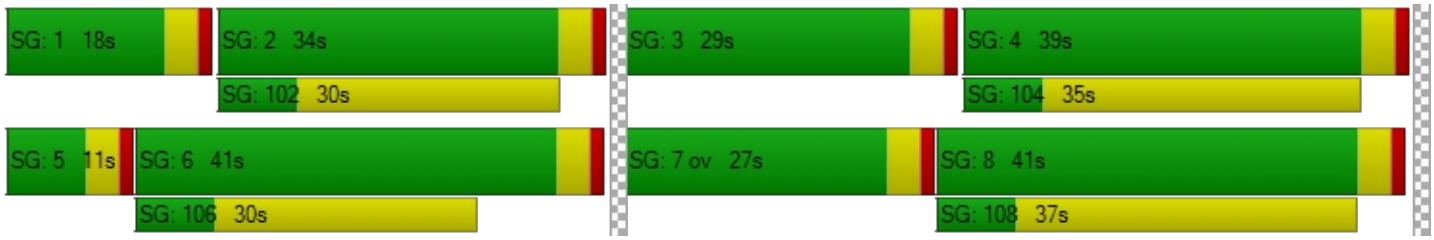
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 54.87 | 38.65 | 58.13 | 148.04 | 30.59 | 30.34 | 60.30 | 72.85 | 99.80 | 151.64 | 63.27 | 16.24 |
| Movement LOS | D | D | E | F | C | C | E | E | F | F | F | B |
| d_A, Approach Delay [s/veh] | 49.04 | | | 91.25 | | | 73.58 | | | 69.68 | | |
| Approach LOS | D | | | F | | | E | | | E | | |
| d_I, Intersection Delay [s/veh] | 69.39 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |
| Intersection V/C | 1.067 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.946 | 2.818 | 3.388 | 3.572 |
| Crosswalk LOS | C | C | C | D |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 616 | 583 | 500 | 616 |
| d_b, Bicycle Delay [s] | 28.73 | 30.13 | 33.78 | 28.73 |
| l_b,int, Bicycle LOS Score for Intersection | 2.784 | 2.300 | 2.515 | 3.239 |
| Bicycle LOS | C | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 17.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.795 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 764 | 0 | 601 | 0 | 1892 | 1130 | 0 | 2644 | 475 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 764 | 0 | 601 | 0 | 1892 | 1130 | 0 | 2644 | 475 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 191 | 0 | 150 | 0 | 473 | 283 | 0 | 661 | 119 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 764 | 0 | 601 | 0 | 1892 | 1130 | 0 | 2644 | 475 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_di, Inbound Pedestrian Volume crossing m | | 0 | | | 0 | | | 0 | | | 0 | |
| v_co, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ci, Inbound Pedestrian Volume crossing mi | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ab, Corner Pedestrian Volume [ped/h] | | 0 | | | 0 | | | 0 | | | 0 | |
| Bicycle Volume [bicycles/h] | | 0 | | | 0 | | | 0 | | | 0 | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 8.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 64 | 0 | 0 | 0 | 26 | 0 | 0 | 26 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | | No | |
| Maximum Recall | | | | No | | | | No | | | No | |
| Pedestrian Recall | | | | No | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | C | R | C | C |
|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 28 | 28 | 28 | 54 | 54 |
| g / C, Green / Cycle | | 0.31 | 0.31 | 0.31 | 0.60 | 0.60 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.26 | 0.26 | 0.24 | 0.33 | 0.46 |
| s, saturation flow rate [veh/h] | | 1750 | 1750 | 1900 | 5700 | 5700 |
| c, Capacity [veh/h] | | 542 | 542 | 589 | 3426 | 3426 |
| d1, Uniform Delay [s] | | 28.91 | 28.91 | 28.13 | 10.70 | 13.33 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 3.57 | 3.57 | 2.20 | 0.65 | 1.75 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.84 | 0.84 | 0.77 | 0.55 | 0.77 |
| d, Delay for Lane Group [s/veh] | | 32.48 | 32.48 | 30.33 | 11.34 | 15.07 |
| Lane Group LOS | | C | C | C | B | B |
| Critical Lane Group | | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | | 9.35 | 9.35 | 8.94 | 6.90 | 12.21 |
| 50th-Percentile Queue Length [ft/ln] | | 233.84 | 233.84 | 223.46 | 172.48 | 305.27 |
| 95th-Percentile Queue Length [veh/ln] | | 14.37 | 14.37 | 13.84 | 11.21 | 17.94 |
| 95th-Percentile Queue Length [ft/ln] | | 359.23 | 359.23 | 346.04 | 280.17 | 448.54 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 32.48 | 0.00 | 30.85 | 0.00 | 11.34 | 0.00 | 0.00 | 15.07 | 0.00 |
| Movement LOS | | | | C | | C | | B | | | B | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 31.76 | | | 11.34 | | | 15.07 | | |
| Approach LOS | A | | | C | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 17.74 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.795 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 0.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 0.00 | 34.63 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 0.000 | 2.463 | 0.000 | 0.000 |
| Crosswalk LOS | F | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 1335 | 489 | 489 |
| d_b, Bicycle Delay [s] | 44.96 | 4.98 | 25.65 | 25.65 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 3.812 | 2.600 | 3.014 |
| Bicycle LOS | D | D | B | C |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 26.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.806 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1115 | 64 | 506 | 0 | 0 | 192 | 182 | 2113 | 421 | 0 | 2761 | 38 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1115 | 64 | 506 | 0 | 0 | 192 | 182 | 2113 | 421 | 0 | 2761 | 38 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 279 | 16 | 127 | 0 | 0 | 48 | 46 | 528 | 105 | 0 | 690 | 10 |
| Total Analysis Volume [veh/h] | 1115 | 64 | 506 | 0 | 0 | 192 | 182 | 2113 | 421 | 0 | 2761 | 38 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 105 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 0 | 6 | 6 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 50 | 0 | 0 | 0 | 25 | 25 | 55 | 0 | 0 | 30 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | | No | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | | No | No | No | | | No | |
| Maximum Recall | | No | | | | No | No | No | | | No | |
| Pedestrian Recall | | No | | | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 31 | 31 | 31 | 13 | 13 | 66 | 49 | 49 |
| g / C, Green / Cycle | 0.30 | 0.30 | 0.30 | 0.12 | 0.12 | 0.63 | 0.46 | 0.46 |
| (v / s)_i Volume / Saturation Flow Rate | 0.24 | 0.24 | 0.22 | 0.05 | 0.10 | 0.37 | 0.37 | 0.37 |
| s, saturation flow rate [veh/h] | 3500 | 1750 | 1900 | 3800 | 1800 | 5700 | 5700 | 1900 |
| c, Capacity [veh/h] | 1043 | 521 | 566 | 469 | 222 | 3568 | 2647 | 882 |
| d1, Uniform Delay [s] | 33.92 | 34.24 | 33.39 | 42.48 | 44.87 | 11.67 | 23.84 | 23.84 |
| k, delay calibration | 0.11 | 0.13 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.43 | 4.04 | 2.08 | 0.57 | 7.29 | 0.73 | 2.54 | 7.25 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.80 | 0.82 | 0.76 | 0.41 | 0.82 | 0.59 | 0.79 | 0.79 |
| d, Delay for Lane Group [s/veh] | 35.36 | 38.28 | 35.47 | 43.06 | 52.16 | 12.40 | 26.38 | 31.09 |
| Lane Group LOS | D | D | D | D | D | B | C | C |
| Critical Lane Group | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 9.78 | 10.53 | 10.03 | 2.33 | 5.04 | 9.23 | 14.73 | 15.88 |
| 50th-Percentile Queue Length [ft/ln] | 244.47 | 263.36 | 250.73 | 58.28 | 126.07 | 230.65 | 368.19 | 397.09 |
| 95th-Percentile Queue Length [veh/ln] | 14.91 | 15.86 | 15.22 | 4.20 | 8.73 | 14.21 | 21.02 | 22.42 |
| 95th-Percentile Queue Length [ft/ln] | 372.69 | 396.43 | 380.57 | 104.90 | 218.14 | 355.19 | 525.54 | 560.49 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 36.09 | 38.28 | 35.94 | 0.00 | 0.00 | 43.06 | 52.16 | 12.40 | 0.00 | 0.00 | 27.51 | 31.09 |
| Movement LOS | D | D | D | | | D | D | B | | | C | C |
| d_A, Approach Delay [s/veh] | 36.13 | | | 43.06 | | | 15.56 | | | 27.56 | | |
| Approach LOS | D | | | D | | | B | | | C | | |
| d_I, Intersection Delay [s/veh] | 26.10 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.806 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 42.07 | 42.07 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.636 | 2.102 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 876 | 400 | 971 | 495 |
| d_b, Bicycle Delay [s] | 16.57 | 33.60 | 13.88 | 29.72 |
| l_b,int, Bicycle LOS Score for Intersection | 4.340 | 1.560 | 2.822 | 2.714 |
| Bicycle LOS | E | A | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 46.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.939 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 245 | 299 | 102 | 335 | 402 | 289 | 309 | 2154 | 158 | 210 | 1954 | 213 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 245 | 299 | 102 | 335 | 402 | 289 | 309 | 2154 | 158 | 210 | 1954 | 213 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 61 | 75 | 26 | 84 | 101 | 72 | 77 | 539 | 40 | 53 | 489 | 53 |
| Total Analysis Volume [veh/h] | 245 | 299 | 102 | 335 | 402 | 289 | 309 | 2154 | 158 | 210 | 1954 | 213 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 12 | 39 | 0 | 16 | 43 | 0 | 26 | 48 | 0 | 17 | 39 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 29 | 0 | 0 | 26 | 0 | 0 | 25 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 8 | 24 | 24 | 12 | 28 | 28 | 22 | 55 | 55 | 13 | 46 | 46 |
| g / C, Green / Cycle | 0.07 | 0.20 | 0.20 | 0.10 | 0.23 | 0.23 | 0.18 | 0.46 | 0.46 | 0.11 | 0.38 | 0.38 |
| (v / s)_i Volume / Saturation Flow Rate | 0.07 | 0.11 | 0.10 | 0.10 | 0.21 | 0.15 | 0.17 | 0.40 | 0.42 | 0.12 | 0.28 | 0.29 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 238 | 384 | 384 | 354 | 446 | 446 | 331 | 1727 | 864 | 197 | 2167 | 722 |
| d1, Uniform Delay [s] | 55.98 | 42.98 | 42.57 | 53.67 | 44.59 | 41.47 | 48.32 | 29.82 | 30.57 | 53.50 | 32.17 | 32.61 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.21 | 0.11 | 0.22 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 34.79 | 1.20 | 1.02 | 12.79 | 11.90 | 1.58 | 20.37 | 6.87 | 15.76 | 49.42 | 2.36 | 7.73 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 1.03 | 0.54 | 0.50 | 0.95 | 0.90 | 0.65 | 0.93 | 0.88 | 0.91 | 1.07 | 0.74 | 0.77 |
| d, Delay for Lane Group [s/veh] | 90.76 | 44.18 | 43.59 | 66.47 | 56.50 | 43.05 | 68.69 | 36.68 | 46.33 | 102.91 | 34.52 | 40.35 |
| Lane Group LOS | F | D | D | E | E | D | E | D | D | F | C | D |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 4.76 | 5.69 | 5.19 | 5.65 | 13.01 | 7.91 | 10.95 | 21.05 | 24.41 | 8.63 | 13.77 | 15.51 |
| 50th-Percentile Queue Length [ft/ln] | 118.88 | 142.16 | 129.83 | 141.27 | 325.36 | 197.74 | 273.81 | 526.18 | 610.19 | 215.77 | 344.32 | 387.63 |
| 95th-Percentile Queue Length [veh/ln] | 8.41 | 9.60 | 8.93 | 9.55 | 18.93 | 12.52 | 16.38 | 28.57 | 32.51 | 13.80 | 19.86 | 21.96 |
| 95th-Percentile Queue Length [ft/ln] | 210.14 | 239.93 | 223.27 | 238.73 | 473.27 | 313.05 | 409.50 | 714.27 | 812.75 | 345.03 | 496.48 | 549.07 |

**Movement, Approach, & Intersection Results**

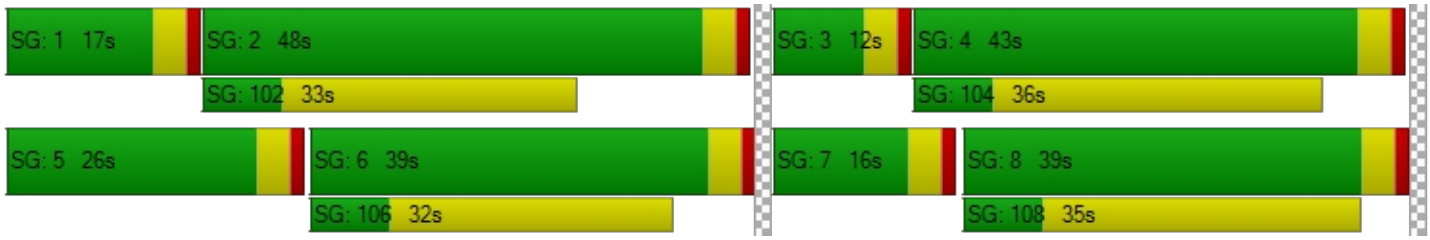
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 90.76 | 44.00 | 43.59 | 66.47 | 56.50 | 43.05 | 68.69 | 39.51 | 46.33 | 102.91 | 35.55 | 40.35 |
| Movement LOS | F | D | D | E | E | D | E | D | D | F | D | D |
| d_A, Approach Delay [s/veh] | 61.67 | | | 55.96 | | | 43.36 | | | 41.93 | | |
| Approach LOS | E | | | E | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 46.56 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.939 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.590 | 2.767 | 3.362 | 3.345 |
| Crosswalk LOS | B | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 583 | 650 | 733 | 583 |
| d_b, Bicycle Delay [s] | 30.13 | 27.37 | 24.09 | 30.13 |
| l_b,int, Bicycle LOS Score for Intersection | 2.093 | 3.253 | 3.001 | 2.540 |
| Bicycle LOS | B | C | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 28.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.845 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 275 | 54 | 310 | 29 | 26 | 16 | 22 | 2179 | 313 | 268 | 2235 | 66 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 275 | 54 | 310 | 29 | 26 | 16 | 22 | 2179 | 313 | 268 | 2235 | 66 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 69 | 14 | 78 | 7 | 7 | 4 | 6 | 545 | 78 | 67 | 559 | 17 |
| Total Analysis Volume [veh/h] | 275 | 54 | 310 | 29 | 26 | 16 | 22 | 2179 | 313 | 268 | 2235 | 66 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 105 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 29 | 0 | 0 | 10 | 0 | 10 | 32 | 0 | 34 | 56 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 14 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 20 | 20 | 20 | 5 | 5 | 3 | 46 | 46 | 18 | 61 | 61 |
| g / C, Green / Cycle | 0.19 | 0.19 | 0.19 | 0.05 | 0.05 | 0.03 | 0.44 | 0.44 | 0.17 | 0.58 | 0.58 |
| (v / s)_i Volume / Saturation Flow Rate | 0.09 | 0.09 | 0.16 | 0.02 | 0.02 | 0.01 | 0.38 | 0.16 | 0.15 | 0.40 | 0.42 |
| s, saturation flow rate [veh/h] | 1750 | 1750 | 1900 | 1800 | 1900 | 1800 | 5700 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 328 | 328 | 356 | 92 | 97 | 51 | 2505 | 835 | 306 | 2209 | 1104 |
| d1, Uniform Delay [s] | 38.28 | 38.33 | 41.47 | 48.12 | 48.41 | 50.25 | 26.73 | 19.77 | 42.55 | 15.31 | 15.76 |
| k, delay calibration | 0.11 | 0.11 | 0.14 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.17 | 1.20 | 8.13 | 1.95 | 3.05 | 5.74 | 4.46 | 1.29 | 7.89 | 1.75 | 3.96 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.50 | 0.51 | 0.87 | 0.32 | 0.43 | 0.43 | 0.87 | 0.37 | 0.88 | 0.68 | 0.71 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 39.45 | 39.54 | 49.60 | 50.07 | 51.46 | 55.99 | 31.18 | 21.05 | 50.45 | 17.05 | 19.72 |
| Lane Group LOS | D | D | D | D | D | E | C | C | D | B | B |
| Critical Lane Group | No | No | Yes | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 3.86 | 3.92 | 8.52 | 0.78 | 1.15 | 0.65 | 16.86 | 5.34 | 7.39 | 12.24 | 13.80 |
| 50th-Percentile Queue Length [ft/ln] | 96.42 | 97.97 | 212.88 | 19.54 | 28.71 | 16.22 | 421.58 | 133.58 | 184.85 | 305.94 | 344.88 |
| 95th-Percentile Queue Length [veh/ln] | 6.94 | 7.05 | 13.30 | 1.41 | 2.07 | 1.17 | 23.60 | 9.13 | 11.85 | 17.97 | 19.89 |
| 95th-Percentile Queue Length [ft/ln] | 173.55 | 176.35 | 332.52 | 35.17 | 51.67 | 29.19 | 589.94 | 228.35 | 296.33 | 449.37 | 497.16 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 39.48 | 39.54 | 49.60 | 50.07 | 51.46 | 51.46 | 55.99 | 31.18 | 21.05 | 50.45 | 17.92 | 19.72 |
| Movement LOS | D | D | D | D | D | D | E | C | C | D | B | B |
| d_A, Approach Delay [s/veh] | 44.39 | | | 50.89 | | | 30.14 | | | 21.36 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 28.07 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.845 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 42.11 | 42.11 | 0.00 | 42.11 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.442 | 2.017 | 0.000 | 3.310 |
| Crosswalk LOS | B | B | F | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 476 | 114 | 533 | 990 |
| d_b, Bicycle Delay [s] | 30.50 | 46.70 | 28.26 | 13.40 |
| l_b,int, Bicycle LOS Score for Intersection | 2.614 | 1.677 | 2.942 | 2.973 |
| Bicycle LOS | B | A | C | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



Brea Mall Expansion, Brea

Vistro File: N:\...\4099 HCM Network.vistro
Report File: N:\...\Sat 2045.pdf

Scenario 12 Sat MD 2045
4/18/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | HCM 6th Edition | SB Left | 0.848 | 48.2 | D |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | HCM 6th Edition | WB Left | 0.788 | 30.2 | C |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | HCM 6th Edition | NB Left | 0.774 | 19.5 | B |
| 4 | Randolph Avenue at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.497 | 18.9 | B |
| 5 | State College Boulevard at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.779 | 41.0 | D |
| 6 | S Associated Road at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.596 | 21.0 | C |
| 7 | Randolph Avenue at Madison Way | Signalized | HCM 6th Edition | WB Left | 0.266 | 17.1 | B |
| 8 | Randolph Avenue at Brea Mall | Signalized | HCM 6th Edition | EB Left | 0.478 | 21.8 | C |
| 9 | Brea Mall South at State College Boulevard | Signalized | HCM 6th Edition | WB Left | 0.786 | 31.8 | C |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | HCM 6th Edition | NB Left | 0.895 | 52.7 | D |
| 11 | Puente Street at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.475 | 13.1 | B |
| 12 | Brea Boulevard at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.865 | 44.2 | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.888 | 42.4 | D |
| 14 | State College Boulevard at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 1.369 | 134.5 | F |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.838 | 20.4 | C |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | HCM 6th Edition | EB Left | 0.947 | 42.5 | D |
| 17 | Associated Road at Imperial Highway | Signalized | HCM 6th Edition | NB Left | 0.827 | 35.9 | D |
| 18 | Castlegate Lane/Placentia | Signalized | HCM 6th | EB Left | 0.807 | 23.5 | C |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | Edition | EB Left | 0.807 | 23.5 | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 48.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.848 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 154 | 290 | 408 | 574 | 406 | 5 | 20 | 1322 | 290 | 780 | 1745 | 789 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 154 | 290 | 408 | 574 | 406 | 5 | 20 | 1322 | 290 | 780 | 1745 | 789 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 39 | 73 | 102 | 144 | 102 | 1 | 5 | 331 | 73 | 195 | 436 | 197 |
| Total Analysis Volume [veh/h] | 154 | 290 | 408 | 574 | 406 | 5 | 20 | 1322 | 290 | 780 | 1745 | 789 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 10 | 33 | 0 | 21 | 44 | 0 | 19 | 39 | 0 | 27 | 47 | 47 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 28 | 0 | 0 | 22 | 22 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 6 | 19 | 19 | 19 | 17 | 30 | 30 | 3 | 45 | 45 | 23 | 65 | 86 |
| g / C, Green / Cycle | 0.05 | 0.16 | 0.16 | 0.16 | 0.14 | 0.25 | 0.25 | 0.02 | 0.37 | 0.37 | 0.19 | 0.54 | 0.71 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.13 | 0.12 | 0.11 | 0.16 | 0.11 | 0.11 | 0.01 | 0.21 | 0.21 | 0.22 | 0.31 | 0.42 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1900 | 3500 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 178 | 305 | 305 | 305 | 497 | 478 | 478 | 88 | 2123 | 708 | 671 | 3072 | 1357 |
| d1, Uniform Delay [s] | 56.58 | 48.90 | 47.94 | 47.80 | 51.51 | 37.69 | 37.67 | 57.36 | 30.06 | 29.88 | 48.52 | 18.39 | 8.38 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 11.90 | 6.43 | 3.39 | 3.14 | 75.08 | 0.61 | 0.61 | 1.28 | 1.13 | 3.19 | 76.82 | 0.77 | 1.82 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.87 | 0.84 | 0.73 | 0.72 | 1.15 | 0.43 | 0.43 | 0.23 | 0.57 | 0.56 | 1.16 | 0.57 | 0.58 |
| d, Delay for Lane Group [s/veh] | 68.48 | 55.33 | 51.33 | 50.93 | 126.58 | 38.30 | 38.28 | 58.65 | 31.19 | 33.07 | 125.34 | 19.16 | 10.21 |
| Lane Group LOS | E | E | D | D | F | D | D | E | C | C | F | B | B |
| Critical Lane Group | No | Yes | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.61 | 7.98 | 6.64 | 6.46 | 12.64 | 5.18 | 5.15 | 0.31 | 9.51 | 9.66 | 17.16 | 10.67 | 9.63 |
| 50th-Percentile Queue Length [ft/ln] | 65.29 | 199.5 | 166.0 | 161.5 | 315.89 | 129.42 | 128.79 | 7.84 | 237.72 | 241.48 | 428.92 | 266.70 | 240.67 |
| 95th-Percentile Queue Length [veh/ln] | 4.70 | 12.62 | 10.87 | 10.63 | 19.66 | 8.91 | 8.87 | 0.56 | 14.57 | 14.76 | 25.81 | 16.02 | 14.72 |
| 95th-Percentile Queue Length [ft/ln] | 117.5 | 315.4 | 271.7 | 265.7 | 491.46 | 222.70 | 221.85 | 14.12 | 364.15 | 368.90 | 645.23 | 400.61 | 367.88 |

**Movement, Approach, & Intersection Results**

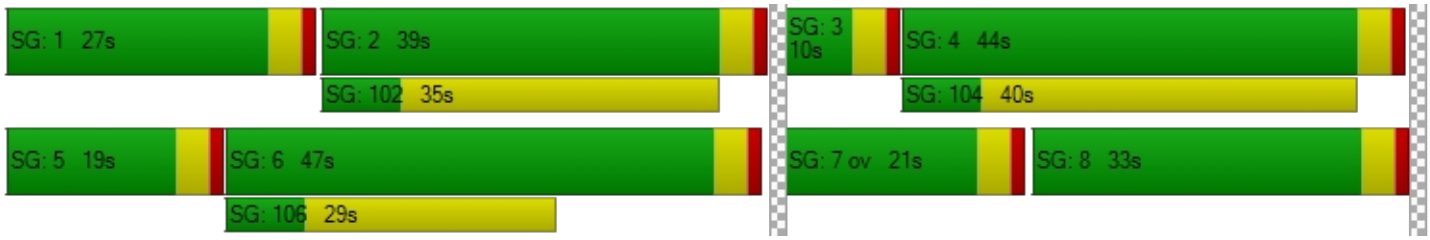
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 68.48 | 54.86 | 51.11 | 126.58 | 38.29 | 38.28 | 58.65 | 31.34 | 33.07 | 125.34 | 19.16 | 10.21 |
| Movement LOS | E | D | D | F | D | D | E | C | C | F | B | B |
| d_A, Approach Delay [s/veh] | 55.53 | | | 89.74 | | | 31.98 | | | 42.02 | | |
| Approach LOS | E | | | F | | | C | | | D | | |
| d_I, Intersection Delay [s/veh] | 48.23 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.848 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.932 | 2.805 | 3.246 | 0.000 |
| Crosswalk LOS | C | C | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 483 | 666 | 583 | 716 |
| d_b, Bicycle Delay [s] | 34.52 | 26.68 | 30.12 | 24.72 |
| l_b,int, Bicycle LOS Score for Intersection | 2.263 | 2.372 | 2.233 | 3.382 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 30.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.788 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 900 | 0 | 1309 | 0 | 1680 | 609 | 246 | 2002 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 900 | 0 | 1309 | 0 | 1680 | 609 | 246 | 2002 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 225 | 0 | 327 | 0 | 420 | 152 | 62 | 501 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 900 | 0 | 1309 | 0 | 1680 | 609 | 246 | 2002 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 79 | 0 | 0 | 0 | 23 | 0 | 18 | 41 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 20 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | No | No | |
| Maximum Recall | | | | No | | | | No | | No | No | |
| Pedestrian Recall | | | | No | | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | R | C | R | L | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 52 | 52 | 46 | 46 | 11 | 60 |
| g / C, Green / Cycle | | 0.43 | 0.43 | 0.38 | 0.38 | 0.09 | 0.50 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.26 | 0.34 | 0.29 | 0.16 | 0.07 | 0.35 |
| s, saturation flow rate [veh/h] | | 3500 | 3800 | 5700 | 3800 | 3500 | 5700 |
| c, Capacity [veh/h] | | 1507 | 1636 | 2175 | 1450 | 307 | 2866 |
| d1, Uniform Delay [s] | | 26.17 | 29.66 | 32.52 | 27.31 | 53.67 | 22.86 |
| k, delay calibration | | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 0.38 | 0.94 | 2.74 | 0.90 | 4.81 | 1.44 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.60 | 0.80 | 0.77 | 0.42 | 0.80 | 0.70 |
| d, Delay for Lane Group [s/veh] | | 26.56 | 30.60 | 35.26 | 28.21 | 58.48 | 24.30 |
| Lane Group LOS | | C | C | D | C | E | C |
| Critical Lane Group | | No | Yes | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | | 9.82 | 16.27 | 14.63 | 6.61 | 3.85 | 14.47 |
| 50th-Percentile Queue Length [ft/ln] | | 245.60 | 406.85 | 365.65 | 165.20 | 96.15 | 361.65 |
| 95th-Percentile Queue Length [veh/ln] | | 14.96 | 22.89 | 20.90 | 10.82 | 6.92 | 20.70 |
| 95th-Percentile Queue Length [ft/ln] | | 374.11 | 572.25 | 522.44 | 270.59 | 173.07 | 517.59 |

**Movement, Approach, & Intersection Results**

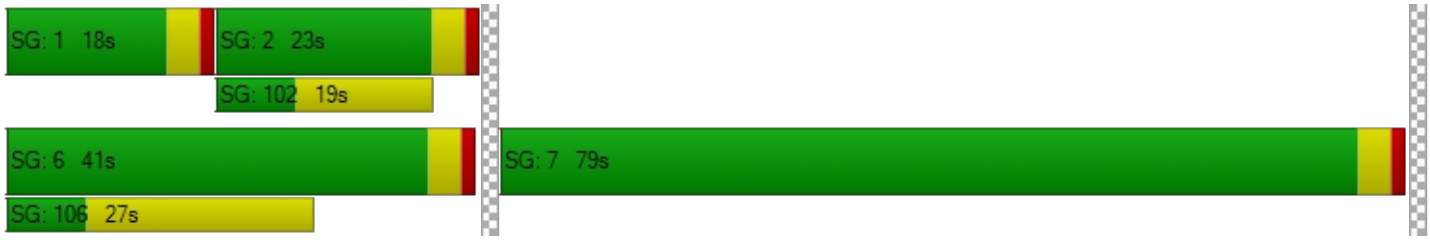
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 26.56 | 0.00 | 30.60 | 0.00 | 35.26 | 28.21 | 58.48 | 24.30 | 0.00 |
| Movement LOS | | | | C | | C | | D | C | E | C | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 28.95 | | | 33.38 | | | 28.04 | | |
| Approach LOS | A | | | C | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 30.15 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.788 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.49 | 49.49 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.145 | 2.683 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 1250 | 317 | 617 |
| d_b, Bicycle Delay [s] | 59.98 | 8.43 | 42.49 | 28.69 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 1.560 | 2.819 | 2.796 |
| Bicycle LOS | D | A | C | C |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 19.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.774 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | | | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | | | | No | | | No | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1159 | 0 | 519 | 0 | 0 | 0 | 0 | 1827 | 752 | 0 | 1067 | 473 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1159 | 0 | 519 | 0 | 0 | 0 | 0 | 1827 | 752 | 0 | 1067 | 473 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 290 | 0 | 130 | 0 | 0 | 0 | 0 | 457 | 188 | 0 | 267 | 0 |
| Total Analysis Volume [veh/h] | 1159 | 0 | 519 | 0 | 0 | 0 | 0 | 1827 | 752 | 0 | 1067 | 0 |
| Presence of On-Street Parking | No | | No | | | | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 54 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 36 | 0 |
| Vehicle Extension [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | No | | | | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | | | | | | | No | | | No | |
| Maximum Recall | No | | | | | | | No | | | No | |
| Pedestrian Recall | No | | | | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | R | | C | C | R | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 35 | 35 | | 47 | 47 | 47 | 47 |
| g / C, Green / Cycle | 0.39 | 0.39 | | 0.52 | 0.52 | 0.52 | 0.52 |
| (v / s)_i Volume / Saturation Flow Rate | 0.33 | 0.27 | | 0.34 | 0.34 | 0.34 | 0.19 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | | 3800 | 1900 | 1900 | 5700 |
| c, Capacity [veh/h] | 1364 | 740 | | 1981 | 990 | 990 | 2971 |
| d1, Uniform Delay [s] | 25.01 | 23.02 | | 15.58 | 15.58 | 15.58 | 12.66 |
| k, delay calibration | 0.11 | 0.11 | | 0.50 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.58 | 1.22 | | 1.68 | 3.32 | 3.32 | 0.34 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.85 | 0.70 | | 0.65 | 0.65 | 0.65 | 0.36 |
| d, Delay for Lane Group [s/veh] | 26.59 | 24.24 | | 17.26 | 18.90 | 18.90 | 13.00 |
| Lane Group LOS | C | C | | B | B | B | B |
| Critical Lane Group | Yes | No | | Yes | No | No | No |
| 50th-Percentile Queue Length [veh/ln] | 10.99 | 9.07 | | 9.33 | 9.78 | 9.78 | 4.07 |
| 50th-Percentile Queue Length [ft/ln] | 274.87 | 226.66 | | 233.17 | 244.47 | 244.47 | 101.71 |
| 95th-Percentile Queue Length [veh/ln] | 16.43 | 14.00 | | 14.34 | 14.91 | 14.91 | 7.32 |
| 95th-Percentile Queue Length [ft/ln] | 410.83 | 350.11 | | 358.39 | 372.68 | 372.68 | 183.08 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 26.59 | 0.00 | 24.24 | 0.00 | 0.00 | 0.00 | 0.00 | 17.35 | 18.90 | 0.00 | 13.00 | 0.00 |
| Movement LOS | C | | C | | | | | B | B | | B | |
| d_A, Approach Delay [s/veh] | 25.86 | | | 0.00 | | | 18.08 | | | 13.00 | | |
| Approach LOS | C | | | A | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 19.51 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.774 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 0.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.63 | 0.00 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.773 | 0.000 | 0.000 | 0.000 |
| Crosswalk LOS | C | F | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1112 | 0 | 712 | 712 |
| d_b, Bicycle Delay [s] | 8.86 | 44.96 | 18.65 | 18.65 |
| l_b,int, Bicycle LOS Score for Intersection | 1.560 | 4.132 | 2.978 | 2.146 |
| Bicycle LOS | A | D | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 18.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.497 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 107 | 81 | 192 | 63 | 39 | 92 | 93 | 739 | 134 | 168 | 895 | 27 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 107 | 81 | 192 | 63 | 39 | 92 | 93 | 739 | 134 | 168 | 895 | 27 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 27 | 20 | 48 | 16 | 10 | 23 | 23 | 185 | 34 | 42 | 224 | 7 |
| Total Analysis Volume [veh/h] | 107 | 81 | 192 | 63 | 39 | 92 | 93 | 739 | 134 | 168 | 895 | 27 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 38 | 0 | 0 | 38 | 0 | 23 | 30 | 0 | 22 | 29 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 25 | 0 | 0 | 19 | 0 | 0 | 18 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 12 | 12 | 12 | 12 | 12 | 6 | 56 | 56 | 10 | 60 | 60 |
| g / C, Green / Cycle | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.07 | 0.62 | 0.62 | 0.11 | 0.67 | 0.67 |
| (v / s)_i Volume / Saturation Flow Rate | 0.06 | 0.04 | 0.10 | 0.04 | 0.07 | 0.05 | 0.24 | 0.22 | 0.09 | 0.24 | 0.01 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 168 | 247 | 247 | 214 | 247 | 124 | 1180 | 1180 | 207 | 2537 | 1269 |
| d1, Uniform Delay [s] | 36.23 | 35.59 | 37.91 | 35.31 | 36.60 | 41.18 | 8.46 | 8.32 | 38.89 | 6.51 | 5.05 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 3.94 | 0.76 | 5.17 | 0.76 | 1.75 | 8.72 | 0.93 | 0.85 | 7.35 | 0.39 | 0.03 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.64 | 0.33 | 0.78 | 0.29 | 0.53 | 0.75 | 0.38 | 0.36 | 0.81 | 0.35 | 0.02 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 40.17 | 36.36 | 43.08 | 36.07 | 38.35 | 49.90 | 9.39 | 9.18 | 46.24 | 6.90 | 5.08 |
| Lane Group LOS | D | D | D | D | D | D | A | A | D | A | A |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.33 | 1.65 | 4.39 | 1.28 | 2.78 | 2.30 | 4.15 | 3.87 | 3.99 | 3.29 | 0.16 |
| 50th-Percentile Queue Length [ft/ln] | 58.31 | 41.25 | 109.72 | 31.95 | 69.44 | 57.59 | 103.87 | 96.71 | 99.81 | 82.35 | 3.97 |
| 95th-Percentile Queue Length [veh/ln] | 4.20 | 2.97 | 7.82 | 2.30 | 5.00 | 4.15 | 7.48 | 6.96 | 7.19 | 5.93 | 0.29 |
| 95th-Percentile Queue Length [ft/ln] | 104.97 | 74.26 | 195.62 | 57.51 | 124.99 | 103.67 | 186.97 | 174.07 | 179.66 | 148.23 | 7.14 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 40.17 | 36.36 | 43.08 | 36.07 | 38.35 | 38.35 | 49.90 | 9.30 | 9.18 | 46.24 | 6.90 | 5.08 |
| Movement LOS | D | D | D | D | D | D | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 40.83 | | | 37.61 | | | 13.19 | | | 12.91 | | |
| Approach LOS | D | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 18.87 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.497 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.70 | 34.70 | 34.70 | 34.70 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.306 | 2.068 | 2.853 | 2.881 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 755 | 755 | 577 | 555 |
| d_b, Bicycle Delay [s] | 17.44 | 17.44 | 22.78 | 23.49 |
| l_b,int, Bicycle LOS Score for Intersection | 2.187 | 1.880 | 2.357 | 2.459 |
| Bicycle LOS | B | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 41.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.779 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 165 | 340 | 207 | 301 | 645 | 531 | 321 | 825 | 180 | 183 | 794 | 270 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 165 | 340 | 207 | 301 | 645 | 531 | 321 | 825 | 180 | 183 | 794 | 270 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 41 | 85 | 52 | 75 | 161 | 133 | 80 | 206 | 45 | 46 | 199 | 68 |
| Total Analysis Volume [veh/h] | 165 | 340 | 207 | 301 | 645 | 531 | 321 | 825 | 180 | 183 | 794 | 270 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 11 | 39 | 0 | 28 | 56 | 0 | 16 | 41 | 0 | 12 | 37 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 7 | 37 | 37 | 13 | 43 | 43 | 12 | 46 | 46 | 8 | 42 | 42 |
| g / C, Green / Cycle | 0.06 | 0.31 | 0.31 | 0.11 | 0.36 | 0.36 | 0.10 | 0.39 | 0.39 | 0.07 | 0.35 | 0.35 |
| (v / s)_i Volume / Saturation Flow Rate | 0.05 | 0.09 | 0.11 | 0.09 | 0.33 | 0.29 | 0.09 | 0.22 | 0.09 | 0.05 | 0.21 | 0.14 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 3500 | 1900 | 1900 | 3500 | 3800 | 1900 | 3500 | 3800 | 1900 |
| c, Capacity [veh/h] | 207 | 1167 | 584 | 374 | 674 | 674 | 352 | 1465 | 732 | 236 | 1339 | 669 |
| d1, Uniform Delay [s] | 55.78 | 31.65 | 32.34 | 52.40 | 37.15 | 35.26 | 53.47 | 28.96 | 25.05 | 55.10 | 31.84 | 29.36 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.29 | 0.23 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 6.92 | 0.14 | 0.37 | 4.10 | 13.33 | 5.20 | 9.30 | 1.57 | 0.80 | 5.43 | 1.94 | 1.81 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.80 | 0.29 | 0.35 | 0.80 | 0.92 | 0.82 | 0.91 | 0.56 | 0.25 | 0.78 | 0.59 | 0.40 |
| d, Delay for Lane Group [s/veh] | 62.70 | 31.79 | 32.71 | 56.50 | 50.48 | 40.46 | 62.77 | 30.53 | 25.84 | 60.53 | 33.78 | 31.17 |
| Lane Group LOS | E | C | C | E | D | D | E | C | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 2.67 | 3.79 | 4.75 | 4.64 | 19.72 | 15.52 | 5.25 | 9.59 | 3.66 | 2.90 | 9.75 | 6.22 |
| 50th-Percentile Queue Length [ft/ln] | 66.66 | 94.87 | 118.84 | 116.07 | 492.92 | 387.91 | 131.15 | 239.82 | 91.55 | 72.57 | 243.74 | 155.60 |
| 95th-Percentile Queue Length [veh/ln] | 4.80 | 6.83 | 8.33 | 8.18 | 27.00 | 21.98 | 9.00 | 14.67 | 6.59 | 5.23 | 14.87 | 10.32 |
| 95th-Percentile Queue Length [ft/ln] | 119.99 | 170.77 | 208.23 | 204.42 | 674.98 | 549.41 | 225.06 | 366.81 | 164.79 | 130.63 | 371.77 | 257.88 |

**Movement, Approach, & Intersection Results**

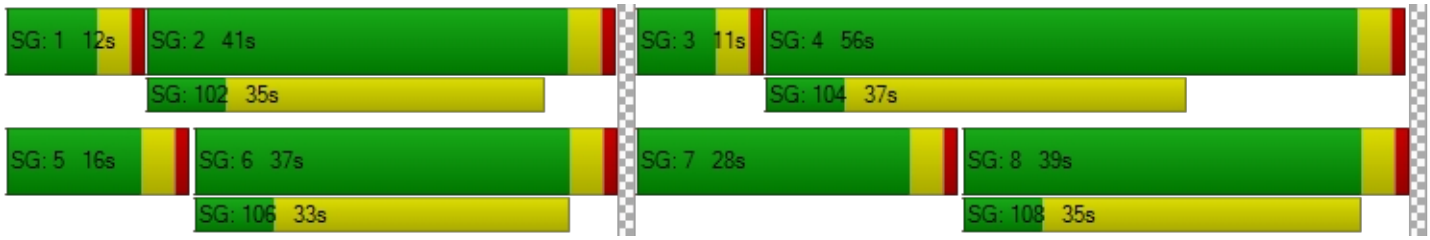
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 62.70 | 31.79 | 32.71 | 56.50 | 50.13 | 40.46 | 62.77 | 30.53 | 25.84 | 60.53 | 33.78 | 31.17 |
| Movement LOS | E | C | C | E | D | D | E | C | C | E | C | C |
| d_A, Approach Delay [s/veh] | 39.22 | | | 47.95 | | | 37.70 | | | 37.14 | | |
| Approach LOS | D | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 40.96 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.779 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 49.52 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.847 | 2.858 | 3.000 | 2.967 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 583 | 866 | 617 | 550 |
| d_b, Bicycle Delay [s] | 30.12 | 19.28 | 28.72 | 31.55 |
| l_b,int, Bicycle LOS Score for Intersection | 2.147 | 2.778 | 2.654 | 2.588 |
| Bicycle LOS | B | C | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 21.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.596 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 358 | 21 | 179 | 13 | 23 | 17 | 11 | 861 | 371 | 161 | 856 | 15 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 358 | 21 | 179 | 13 | 23 | 17 | 11 | 861 | 371 | 161 | 856 | 15 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 90 | 5 | 45 | 3 | 6 | 4 | 3 | 215 | 93 | 40 | 214 | 4 |
| Total Analysis Volume [veh/h] | 358 | 21 | 179 | 13 | 23 | 17 | 11 | 861 | 371 | 161 | 856 | 15 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 110 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 6 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 30 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 24 | 61 | 61 | 0 | 37 | 0 | 10 | 38 | 0 | 11 | 39 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 7 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 26 | 0 | 26 | 0 | 0 | 27 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | No | | No | | No | No | | No | No | |
| Maximum Recall | No | No | No | | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | No | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 14 | 22 | 33 | 5 | 5 | 2 | 69 | 69 | 7 | 74 | 74 |
| g / C, Green / Cycle | 0.12 | 0.20 | 0.30 | 0.04 | 0.04 | 0.02 | 0.62 | 0.62 | 0.06 | 0.67 | 0.67 |
| (v / s)_i Volume / Saturation Flow Rate | 0.10 | 0.01 | 0.09 | 0.01 | 0.02 | 0.01 | 0.34 | 0.31 | 0.05 | 0.23 | 0.23 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 |
| c, Capacity [veh/h] | 434 | 389 | 580 | 100 | 84 | 29 | 1182 | 1182 | 224 | 1273 | 1273 |
| d1, Uniform Delay [s] | 47.03 | 35.20 | 29.34 | 50.63 | 51.35 | 53.59 | 11.90 | 11.35 | 50.53 | 7.77 | 7.76 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.00 | 0.06 | 0.30 | 0.58 | 4.13 | 7.97 | 1.82 | 1.49 | 4.29 | 0.74 | 0.73 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.82 | 0.05 | 0.31 | 0.13 | 0.48 | 0.38 | 0.55 | 0.50 | 0.72 | 0.34 | 0.34 |
| d, Delay for Lane Group [s/veh] | 51.03 | 35.25 | 29.64 | 51.21 | 55.48 | 61.56 | 13.72 | 12.84 | 54.82 | 8.51 | 8.49 |
| Lane Group LOS | D | D | C | D | E | E | B | B | D | A | A |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 5.01 | 0.46 | 3.68 | 0.36 | 1.17 | 0.37 | 9.06 | 7.81 | 2.30 | 4.33 | 4.30 |
| 50th-Percentile Queue Length [ft/ln] | 125.13 | 11.53 | 91.98 | 9.03 | 29.31 | 9.13 | 226.53 | 195.18 | 57.61 | 108.28 | 107.42 |
| 95th-Percentile Queue Length [veh/ln] | 8.67 | 0.83 | 6.62 | 0.65 | 2.11 | 0.66 | 14.00 | 12.39 | 4.15 | 7.74 | 7.70 |
| 95th-Percentile Queue Length [ft/ln] | 216.85 | 20.76 | 165.56 | 16.25 | 52.76 | 16.43 | 349.95 | 309.74 | 103.70 | 193.60 | 192.41 |

**Movement, Approach, & Intersection Results**

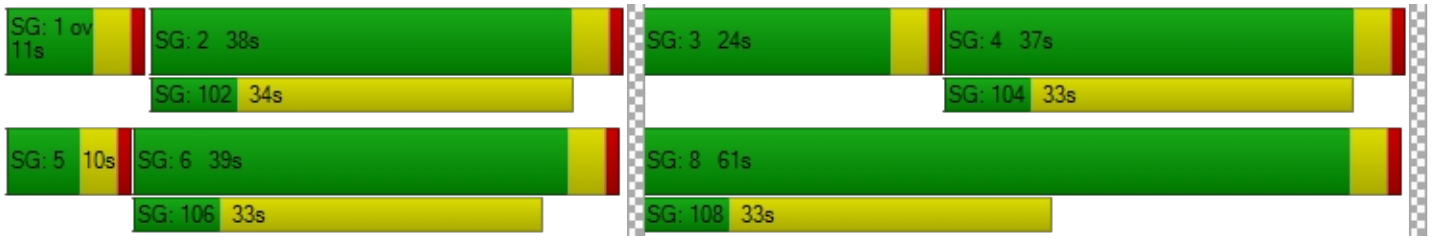
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 51.03 | 35.25 | 29.64 | 51.21 | 55.48 | 55.48 | 61.56 | 13.50 | 12.84 | 54.82 | 8.50 | 8.49 |
| Movement LOS | D | D | C | D | E | E | E | B | B | D | A | A |
| d_A, Approach Delay [s/veh] | 43.57 | | | 54.43 | | | 13.72 | | | 15.72 | | |
| Approach LOS | D | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 20.96 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.596 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 44.56 | 44.56 | 44.56 | 44.56 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.643 | 1.982 | 2.792 | 2.820 |
| Crosswalk LOS | B | A | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1036 | 600 | 618 | 636 |
| d_b, Bicycle Delay [s] | 12.78 | 26.96 | 26.27 | 25.58 |
| l_b,int, Bicycle LOS Score for Intersection | 2.480 | 1.647 | 2.585 | 2.411 |
| Bicycle LOS | B | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |



**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 17.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.266 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 23 | 395 | 120 | 76 | 280 | 25 | 40 | 12 | 63 | 87 | 4 | 60 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 23 | 395 | 120 | 76 | 280 | 25 | 40 | 12 | 63 | 87 | 4 | 60 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 6 | 99 | 30 | 19 | 70 | 6 | 10 | 3 | 16 | 22 | 1 | 15 |
| Total Analysis Volume [veh/h] | 23 | 395 | 120 | 76 | 280 | 25 | 40 | 12 | 63 | 87 | 4 | 60 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 26 | 0 | 10 | 26 | 0 | 0 | 54 | 0 | 0 | 54 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 12 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | L | C | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 3 | 66 | 66 | 5 | 69 | 69 | 6 | 6 | 6 | 6 |
| g / C, Green / Cycle | 0.03 | 0.74 | 0.74 | 0.06 | 0.77 | 0.77 | 0.07 | 0.07 | 0.07 | 0.07 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.14 | 0.13 | 0.04 | 0.08 | 0.08 | 0.02 | 0.04 | 0.05 | 0.03 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 55 | 1401 | 1401 | 104 | 1453 | 1453 | 118 | 136 | 107 | 136 |
| d1, Uniform Delay [s] | 42.88 | 3.62 | 3.58 | 41.73 | 2.71 | 2.71 | 39.68 | 40.39 | 40.77 | 40.15 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.05 | 0.30 | 0.28 | 9.39 | 0.15 | 0.14 | 1.69 | 3.44 | 13.36 | 2.50 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.42 | 0.19 | 0.18 | 0.73 | 0.11 | 0.10 | 0.34 | 0.55 | 0.81 | 0.47 |
|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 47.93 | 3.92 | 3.86 | 51.12 | 2.86 | 2.85 | 41.37 | 43.83 | 54.13 | 42.65 |
| Lane Group LOS | D | A | A | D | A | A | D | D | D | D |
| Critical Lane Group | No | Yes | No | Yes | No | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.57 | 1.25 | 1.16 | 1.91 | 0.56 | 0.55 | 0.89 | 1.72 | 2.26 | 1.44 |
| 50th-Percentile Queue Length [ft/ln] | 14.37 | 31.25 | 28.95 | 47.83 | 13.94 | 13.67 | 22.19 | 42.96 | 56.45 | 36.05 |
| 95th-Percentile Queue Length [veh/ln] | 1.03 | 2.25 | 2.08 | 3.44 | 1.00 | 0.98 | 1.60 | 3.09 | 4.06 | 2.60 |
| 95th-Percentile Queue Length [ft/ln] | 25.87 | 56.26 | 52.11 | 86.10 | 25.09 | 24.60 | 39.93 | 77.32 | 101.61 | 64.88 |

**Movement, Approach, & Intersection Results**

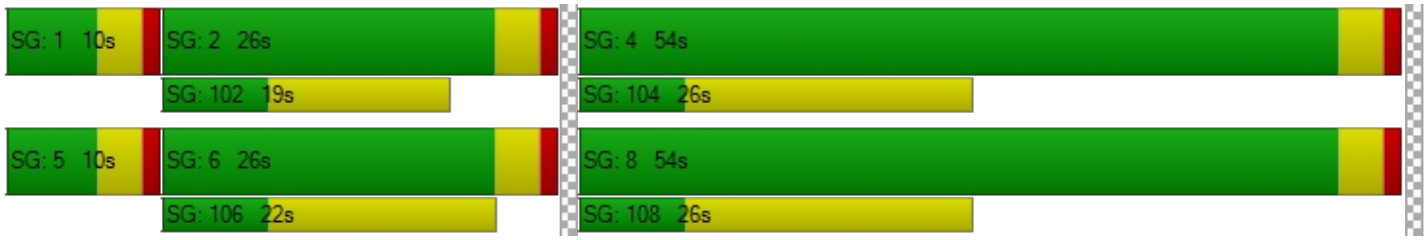
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 47.93 | 3.90 | 3.86 | 51.12 | 2.86 | 2.85 | 41.37 | 43.83 | 43.83 | 54.13 | 42.65 | 42.65 |
| Movement LOS | D | A | A | D | A | A | D | D | D | D | D | D |
| d_A, Approach Delay [s/veh] | 5.77 | | | 12.49 | | | 42.97 | | | 49.27 | | |
| Approach LOS | A | | | B | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 17.08 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.266 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.612 | 2.527 | 1.994 | 2.056 |
| Crosswalk LOS | B | B | A | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 489 | 489 | 1111 | 1111 |
| d_b, Bicycle Delay [s] | 25.70 | 25.70 | 8.90 | 8.90 |
| l_b,int, Bicycle LOS Score for Intersection | 2.003 | 1.874 | 1.749 | 1.809 |
| Bicycle LOS | B | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 21.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.478 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 26 | 467 | 453 | 45 | 336 | 23 | 25 | 16 | 28 | 415 | 6 | 82 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 26 | 467 | 453 | 45 | 336 | 23 | 25 | 16 | 28 | 415 | 6 | 82 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 117 | 113 | 11 | 84 | 6 | 6 | 4 | 7 | 104 | 2 | 21 |
| Total Analysis Volume [veh/h] | 26 | 467 | 453 | 45 | 336 | 23 | 25 | 16 | 28 | 415 | 6 | 82 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 29 | 0 | 10 | 29 | 0 | 0 | 30 | 0 | 0 | 31 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 17 | 0 | 0 | 18 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | C | R | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 0.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 66 | 58 | 58 | 66 | 59 | 59 | 5 | 5 | 17 | 17 |
| g / C, Green / Cycle | 0.66 | 0.58 | 0.58 | 0.66 | 0.59 | 0.59 | 0.05 | 0.05 | 0.17 | 0.17 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.25 | 0.24 | 0.03 | 0.10 | 0.09 | 0.02 | 0.01 | 0.14 | 0.13 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 1209 | 1095 | 1095 | 1034 | 1118 | 1118 | 93 | 98 | 304 | 321 |
| d1, Uniform Delay [s] | 5.88 | 11.91 | 11.80 | 5.95 | 9.38 | 9.36 | 46.04 | 45.67 | 40.31 | 39.73 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.01 | 1.22 | 1.16 | 0.08 | 0.31 | 0.31 | 3.25 | 1.57 | 6.34 | 3.90 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.02 | 0.43 | 0.41 | 0.04 | 0.16 | 0.16 | 0.44 | 0.28 | 0.84 | 0.77 |
| d, Delay for Lane Group [s/veh] | 5.89 | 13.13 | 12.95 | 6.02 | 9.69 | 9.67 | 49.29 | 47.24 | 46.66 | 43.64 |
| Lane Group LOS | A | B | B | A | A | A | D | D | D | D |
| Critical Lane Group | No | Yes | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.18 | 5.86 | 5.63 | 0.33 | 1.80 | 1.77 | 1.07 | 0.71 | 6.58 | 6.08 |
| 50th-Percentile Queue Length [ft/ln] | 4.39 | 146.57 | 140.69 | 8.14 | 45.08 | 44.34 | 26.72 | 17.75 | 164.45 | 152.02 |
| 95th-Percentile Queue Length [veh/ln] | 0.32 | 9.83 | 9.52 | 0.59 | 3.25 | 3.19 | 1.92 | 1.28 | 10.78 | 10.12 |
| 95th-Percentile Queue Length [ft/ln] | 7.90 | 245.84 | 237.95 | 14.65 | 81.14 | 79.81 | 48.10 | 31.95 | 269.61 | 253.12 |

**Movement, Approach, & Intersection Results**

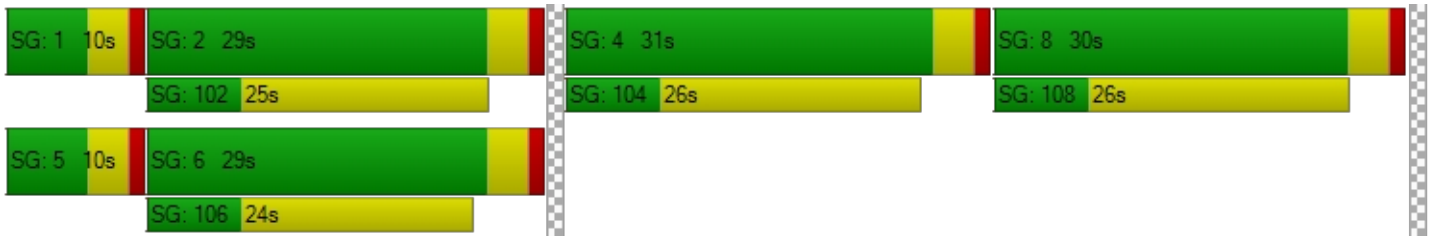
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 5.89 | 13.13 | 12.95 | 6.02 | 9.68 | 9.67 | 49.29 | 49.29 | 47.24 | 45.50 | 43.64 | 43.64 |
| Movement LOS | A | B | B | A | A | A | D | D | D | D | D | D |
| d_A, Approach Delay [s/veh] | 12.85 | | | 9.27 | | | 48.46 | | | 45.18 | | |
| Approach LOS | B | | | A | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 21.83 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.478 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 39.62 | 39.62 | 39.62 | 39.62 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.641 | 2.495 | 2.008 | 2.314 |
| Crosswalk LOS | B | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 500 | 500 | 520 | 540 |
| d_b, Bicycle Delay [s] | 28.14 | 28.14 | 27.40 | 26.66 |
| l_b,int, Bicycle LOS Score for Intersection | 2.340 | 1.893 | 1.673 | 2.390 |
| Bicycle LOS | B | A | A | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 31.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.786 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 184 | 34 | 99 | 65 | 29 | 555 | 711 | 511 | 41 | 93 | 674 | 38 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 184 | 34 | 99 | 65 | 29 | 555 | 711 | 511 | 41 | 93 | 674 | 38 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 46 | 9 | 25 | 16 | 7 | 139 | 178 | 128 | 10 | 23 | 169 | 10 |
| Total Analysis Volume [veh/h] | 184 | 34 | 99 | 65 | 29 | 555 | 711 | 511 | 41 | 93 | 674 | 38 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 6 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 30 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 37 | 0 | 0 | 12 | 12 | 39 | 31 | 0 | 40 | 32 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 21 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | No | No | No | | No | No | |
| Maximum Recall | | No | | | No | No | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | No | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | C | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 11 | 11 | 11 | 8 | 8 | 58 | 30 | 77 | 77 | 8 | 54 | 54 |
| g / C, Green / Cycle | 0.10 | 0.10 | 0.10 | 0.07 | 0.07 | 0.48 | 0.25 | 0.64 | 0.64 | 0.07 | 0.45 | 0.45 |
| (v / s)_i Volume / Saturation Flow Rate | 0.05 | 0.08 | 0.05 | 0.04 | 0.02 | 0.29 | 0.20 | 0.15 | 0.14 | 0.05 | 0.19 | 0.19 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 1900 | 1900 |
| c, Capacity [veh/h] | 206 | 224 | 181 | 122 | 129 | 915 | 881 | 1209 | 1209 | 121 | 859 | 859 |
| d1, Uniform Delay [s] | 51.53 | 53.20 | 51.89 | 54.12 | 52.98 | 22.82 | 42.20 | 9.30 | 9.27 | 55.11 | 22.24 | 22.15 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.24 | 2.66 | 2.58 | 3.53 | 0.87 | 2.99 | 1.81 | 0.45 | 0.43 | 9.78 | 1.50 | 1.45 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.40 | 0.61 | 0.55 | 0.53 | 0.22 | 0.61 | 0.81 | 0.23 | 0.23 | 0.77 | 0.42 | 0.41 |
| d, Delay for Lane Group [s/veh] | 52.77 | 55.86 | 54.46 | 57.66 | 53.85 | 25.80 | 44.01 | 9.75 | 9.70 | 64.89 | 23.74 | 23.60 |
| Lane Group LOS | D | E | D | E | D | C | D | A | A | E | C | C |
| Critical Lane Group | No | Yes | No | No | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 2.42 | 4.18 | 2.98 | 2.02 | 0.86 | 12.06 | 10.06 | 3.16 | 3.08 | 3.10 | 7.18 | 7.02 |
| 50th-Percentile Queue Length [ft/ln] | 60.46 | 104.43 | 74.49 | 50.58 | 21.56 | 301.40 | 251.50 | 79.07 | 76.88 | 77.47 | 179.44 | 175.38 |
| 95th-Percentile Queue Length [veh/ln] | 4.35 | 7.52 | 5.36 | 3.64 | 1.55 | 17.75 | 15.26 | 5.69 | 5.54 | 5.58 | 11.57 | 11.36 |
| 95th-Percentile Queue Length [ft/ln] | 108.82 | 187.97 | 134.08 | 91.05 | 38.80 | 443.76 | 381.54 | 142.33 | 138.39 | 139.44 | 289.29 | 283.97 |

**Movement, Approach, & Intersection Results**

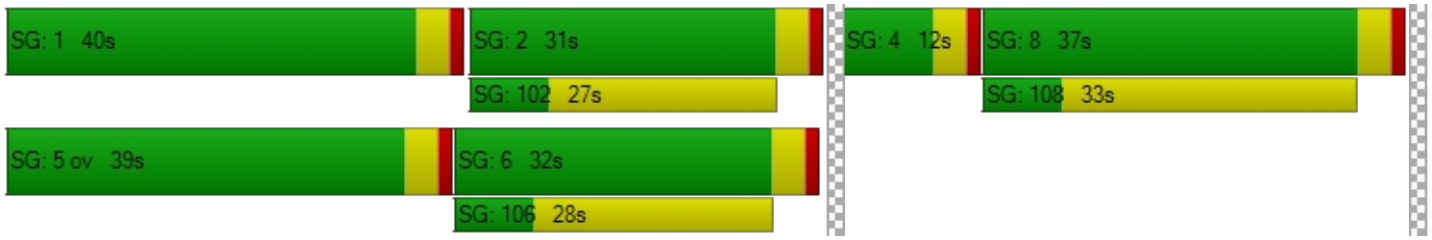
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 54.41 | 55.86 | 54.46 | 57.66 | 53.85 | 25.80 | 44.01 | 9.73 | 9.70 | 64.89 | 23.68 | 23.60 |
| Movement LOS | D | E | D | E | D | C | D | A | A | E | C | C |
| d_A, Approach Delay [s/veh] | 54.62 | | | 30.25 | | | 29.03 | | | 28.44 | | |
| Approach LOS | D | | | C | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 31.81 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.786 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 0.00 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.407 | 2.593 | 0.000 | 2.602 |
| Crosswalk LOS | B | B | F | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 550 | 133 | 450 | 466 |
| d_b, Bicycle Delay [s] | 31.57 | 52.30 | 36.07 | 35.30 |
| l_b,int, Bicycle LOS Score for Intersection | 2.083 | 2.095 | 2.602 | 2.224 |
| Bicycle LOS | B | B | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 52.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.895 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 719 | 989 | 282 | 246 | 896 | 315 | 371 | 1287 | 391 | 368 | 1390 | 231 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 719 | 989 | 282 | 246 | 896 | 315 | 371 | 1287 | 391 | 368 | 1390 | 231 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 180 | 247 | 71 | 62 | 224 | 79 | 93 | 322 | 98 | 92 | 348 | 58 |
| Total Analysis Volume [veh/h] | 719 | 989 | 282 | 246 | 896 | 315 | 371 | 1287 | 391 | 368 | 1390 | 231 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 25 | 49 | 0 | 14 | 38 | 0 | 17 | 42 | 0 | 15 | 40 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 31 | 0 | 0 | 28 | 0 | 0 | 31 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 21 | 35 | 35 | 10 | 24 | 24 | 13 | 48 | 48 | 11 | 46 | 46 |
| g / C, Green / Cycle | 0.18 | 0.29 | 0.29 | 0.08 | 0.20 | 0.20 | 0.11 | 0.40 | 0.40 | 0.09 | 0.38 | 0.38 |
| (v / s)_i Volume / Saturation Flow Rate | 0.21 | 0.17 | 0.15 | 0.07 | 0.16 | 0.17 | 0.11 | 0.30 | 0.28 | 0.11 | 0.24 | 0.12 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 614 | 1679 | 560 | 296 | 1161 | 387 | 383 | 1501 | 750 | 325 | 2157 | 719 |
| d1, Uniform Delay [s] | 49.53 | 36.17 | 35.10 | 54.14 | 45.19 | 45.66 | 53.30 | 31.39 | 30.72 | 54.49 | 30.69 | 26.42 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.15 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 81.15 | 0.33 | 0.70 | 6.00 | 1.12 | 5.77 | 15.30 | 3.64 | 5.88 | 68.70 | 1.50 | 1.18 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 1.17 | 0.59 | 0.50 | 0.83 | 0.77 | 0.81 | 0.97 | 0.76 | 0.72 | 1.13 | 0.64 | 0.32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 130.67 | 36.50 | 35.81 | 60.14 | 46.31 | 51.42 | 68.59 | 35.03 | 36.60 | 123.19 | 32.19 | 27.60 |
| Lane Group LOS | F | D | D | E | D | D | E | D | D | F | C | C |
| Critical Lane Group | Yes | No | No | No | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 16.08 | 8.28 | 6.94 | 3.91 | 8.51 | 9.56 | 6.38 | 14.79 | 14.25 | 8.00 | 11.22 | 4.92 |
| 50th-Percentile Queue Length [ft/ln] | 402.12 | 207.06 | 173.56 | 97.68 | 212.79 | 239.03 | 159.54 | 369.63 | 356.30 | 200.07 | 280.48 | 123.06 |
| 95th-Percentile Queue Length [veh/ln] | 24.44 | 13.00 | 11.26 | 7.03 | 13.30 | 14.63 | 10.52 | 21.09 | 20.44 | 13.22 | 16.71 | 8.56 |
| 95th-Percentile Queue Length [ft/ln] | 610.89 | 325.05 | 281.59 | 175.82 | 332.40 | 365.80 | 263.11 | 527.28 | 511.08 | 330.43 | 417.81 | 214.02 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 130.67 | 36.50 | 35.81 | 60.14 | 46.31 | 51.42 | 68.59 | 35.21 | 36.60 | 123.19 | 32.19 | 27.60 |
| Movement LOS | F | D | D | E | D | D | E | D | D | F | C | C |
| d_A, Approach Delay [s/veh] | 70.43 | | | 49.75 | | | 41.52 | | | 48.49 | | |
| Approach LOS | E | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 52.66 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.895 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.258 | 3.193 | 3.284 | 3.275 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 750 | 566 | 633 | 600 |
| d_b, Bicycle Delay [s] | 23.46 | 30.85 | 28.04 | 29.43 |
| l_b,int, Bicycle LOS Score for Intersection | 2.654 | 2.361 | 2.687 | 2.654 |
| Bicycle LOS | B | B | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 13.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.475 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 28 | 33 | 107 | 184 | 46 | 134 | 86 | 1423 | 39 | 84 | 1461 | 242 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 28 | 33 | 107 | 184 | 46 | 134 | 86 | 1423 | 39 | 84 | 1461 | 242 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 8 | 27 | 46 | 12 | 34 | 22 | 356 | 10 | 21 | 365 | 61 |
| Total Analysis Volume [veh/h] | 28 | 33 | 107 | 184 | 46 | 134 | 86 | 1423 | 39 | 84 | 1461 | 242 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 38 | 0 | 0 | 38 | 0 | 18 | 31 | 0 | 21 | 34 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 23 | 0 | 0 | 17 | 0 | 0 | 23 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 12 | 12 | 12 | 12 | 12 | 12 | 6 | 61 | 61 | 6 | 61 | 61 |
| g / C, Green / Cycle | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.06 | 0.68 | 0.68 | 0.06 | 0.67 | 0.67 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.02 | 0.06 | 0.10 | 0.01 | 0.07 | 0.05 | 0.25 | 0.26 | 0.05 | 0.26 | 0.13 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 263 | 247 | 247 | 254 | 494 | 247 | 115 | 2561 | 1281 | 113 | 3836 | 1279 |
| d1, Uniform Delay [s] | 34.63 | 34.69 | 36.13 | 37.97 | 34.51 | 36.68 | 41.46 | 6.41 | 6.49 | 41.51 | 6.48 | 5.52 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.18 | 0.24 | 1.20 | 3.88 | 0.08 | 1.85 | 9.30 | 0.42 | 0.89 | 9.29 | 0.29 | 0.33 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.11 | 0.13 | 0.43 | 0.72 | 0.09 | 0.54 | 0.75 | 0.38 | 0.39 | 0.74 | 0.38 | 0.19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 34.81 | 34.94 | 37.32 | 41.85 | 34.59 | 38.53 | 50.75 | 6.83 | 7.38 | 50.81 | 6.77 | 5.85 |
| Lane Group LOS | C | C | D | D | C | D | D | A | A | D | A | A |
| Critical Lane Group | No | No | No | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.55 | 0.65 | 2.22 | 4.15 | 0.45 | 2.85 | 2.15 | 3.53 | 3.86 | 2.11 | 3.55 | 1.58 |
| 50th-Percentile Queue Length [ft/ln] | 13.75 | 16.28 | 55.60 | 103.63 | 11.13 | 71.25 | 53.83 | 88.13 | 96.46 | 52.63 | 88.70 | 39.40 |
| 95th-Percentile Queue Length [veh/ln] | 0.99 | 1.17 | 4.00 | 7.46 | 0.80 | 5.13 | 3.88 | 6.35 | 6.95 | 3.79 | 6.39 | 2.84 |
| 95th-Percentile Queue Length [ft/ln] | 24.76 | 29.30 | 100.08 | 186.54 | 20.04 | 128.26 | 96.89 | 158.63 | 173.63 | 94.73 | 159.67 | 70.91 |

**Movement, Approach, & Intersection Results**

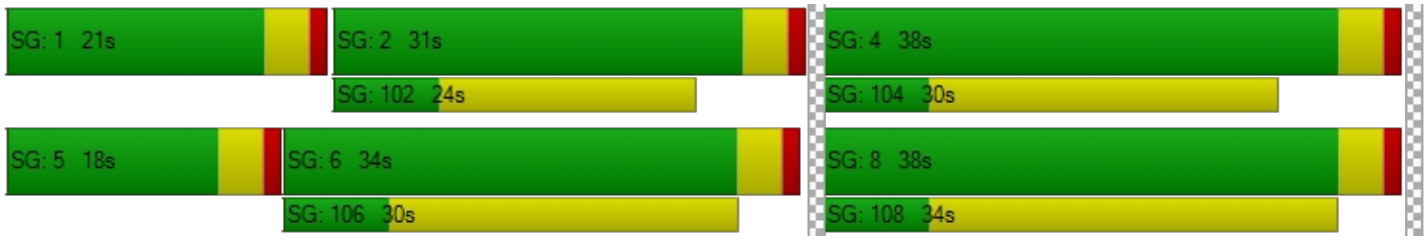
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 34.81 | 34.94 | 37.32 | 41.85 | 34.59 | 38.53 | 50.75 | 7.01 | 7.38 | 50.81 | 6.77 | 5.85 |
| Movement LOS | C | C | D | D | C | D | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 36.44 | | | 39.71 | | | 9.45 | | | 8.71 | | |
| Approach LOS | D | | | D | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 13.13 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.475 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.70 | 34.70 | 34.70 | 34.70 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.365 | 2.441 | 3.075 | 3.413 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 755 | 755 | 600 | 666 |
| d_b, Bicycle Delay [s] | 17.44 | 17.44 | 22.07 | 20.02 |
| l_b,int, Bicycle LOS Score for Intersection | 1.837 | 1.860 | 2.411 | 2.542 |
| Bicycle LOS | A | A | B | B |

## Sequence

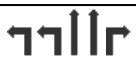
| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 44.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.865 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 451 | 669 | 300 | 490 | 984 | 274 | 296 | 1448 | 302 | 378 | 1479 | 435 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 451 | 669 | 300 | 490 | 984 | 274 | 296 | 1448 | 302 | 378 | 1479 | 435 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 113 | 167 | 75 | 123 | 246 | 69 | 74 | 362 | 76 | 95 | 370 | 109 |
| Total Analysis Volume [veh/h] | 451 | 669 | 300 | 490 | 984 | 274 | 296 | 1448 | 302 | 378 | 1479 | 435 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 20 | 41 | 0 | 21 | 42 | 0 | 15 | 41 | 0 | 17 | 43 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 16 | 33 | 33 | 17 | 34 | 34 | 11 | 41 | 41 | 13 | 43 | 43 |
| g / C, Green / Cycle | 0.13 | 0.28 | 0.28 | 0.14 | 0.29 | 0.29 | 0.09 | 0.34 | 0.34 | 0.11 | 0.36 | 0.36 |
| (v / s)_i Volume / Saturation Flow Rate | 0.13 | 0.12 | 0.16 | 0.14 | 0.26 | 0.14 | 0.08 | 0.25 | 0.16 | 0.11 | 0.26 | 0.23 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 469 | 1574 | 525 | 498 | 1081 | 540 | 325 | 1932 | 644 | 383 | 2026 | 675 |
| d1, Uniform Delay [s] | 51.69 | 35.65 | 37.37 | 51.37 | 41.50 | 35.94 | 54.00 | 35.18 | 31.21 | 53.42 | 33.69 | 32.36 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 12.07 | 0.18 | 0.98 | 15.22 | 3.38 | 0.74 | 9.86 | 2.72 | 2.44 | 18.70 | 2.36 | 4.69 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.96 | 0.43 | 0.57 | 0.98 | 0.91 | 0.51 | 0.91 | 0.75 | 0.47 | 0.99 | 0.73 | 0.64 |
| d, Delay for Lane Group [s/veh] | 63.77 | 35.84 | 38.35 | 66.59 | 44.88 | 36.68 | 63.86 | 37.91 | 33.65 | 72.12 | 36.05 | 37.04 |
| Lane Group LOS | E | D | D | E | D | D | E | D | C | E | D | D |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 7.52 | 5.39 | 7.71 | 8.38 | 14.42 | 6.82 | 4.87 | 12.88 | 7.32 | 6.68 | 12.83 | 11.38 |
| 50th-Percentile Queue Length [ft/ln] | 187.97 | 134.79 | 192.71 | 209.58 | 360.53 | 170.52 | 121.83 | 322.07 | 182.90 | 167.00 | 320.70 | 284.38 |
| 95th-Percentile Queue Length [veh/ln] | 12.02 | 9.20 | 12.26 | 13.13 | 20.65 | 11.10 | 8.49 | 18.77 | 11.75 | 10.92 | 18.70 | 16.91 |
| 95th-Percentile Queue Length [ft/ln] | 300.40 | 229.99 | 306.54 | 328.30 | 516.22 | 277.60 | 212.34 | 469.23 | 293.80 | 272.97 | 467.54 | 422.66 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 63.77 | 35.84 | 38.35 | 66.59 | 44.88 | 36.68 | 63.86 | 37.91 | 33.65 | 72.12 | 36.05 | 37.04 |
| Movement LOS | E | D | D | E | D | D | E | D | C | E | D | D |
| d_A, Approach Delay [s/veh] | 45.24 | | | 49.68 | | | 41.03 | | | 42.19 | | |
| Approach LOS | D | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 44.19 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.865 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.115 | 3.123 | 3.323 | 3.354 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 616 | 633 | 616 | 650 |
| d_b, Bicycle Delay [s] | 28.73 | 28.04 | 28.73 | 27.37 |
| l_b,int, Bicycle LOS Score for Intersection | 2.341 | 3.002 | 2.685 | 2.820 |
| Bicycle LOS | B | C | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 42.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.888 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 107 | 49 | 209 | 441 | 90 | 314 | 338 | 1684 | 68 | 151 | 1996 | 497 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 107 | 49 | 209 | 441 | 90 | 314 | 338 | 1684 | 68 | 151 | 1996 | 497 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 27 | 12 | 52 | 110 | 23 | 79 | 85 | 421 | 17 | 38 | 499 | 124 |
| Total Analysis Volume [veh/h] | 107 | 49 | 209 | 441 | 90 | 314 | 338 | 1684 | 68 | 151 | 1996 | 497 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 15 | 0 | 0 | 40 | 0 | 17 | 49 | 0 | 16 | 48 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 28 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 15 | 15 | 15 | 29 | 29 | 13 | 48 | 48 | 12 | 47 | 47 |
| g / C, Green / Cycle | 0.13 | 0.13 | 0.13 | 0.24 | 0.24 | 0.11 | 0.40 | 0.40 | 0.10 | 0.39 | 0.39 |
| (v / s)_i Volume / Saturation Flow Rate | 0.06 | 0.03 | 0.11 | 0.13 | 0.21 | 0.10 | 0.30 | 0.31 | 0.08 | 0.35 | 0.26 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 3500 | 1900 | 3500 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 230 | 230 | 243 | 836 | 454 | 381 | 1524 | 762 | 178 | 2231 | 744 |
| d1, Uniform Delay [s] | 48.56 | 46.96 | 51.32 | 39.80 | 44.18 | 52.77 | 30.93 | 31.39 | 53.18 | 34.21 | 30.11 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.24 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.46 | 0.46 | 8.73 | 0.52 | 12.50 | 7.06 | 3.58 | 7.89 | 10.44 | 6.07 | 4.73 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.47 | 0.21 | 0.86 | 0.53 | 0.89 | 0.89 | 0.76 | 0.78 | 0.85 | 0.89 | 0.67 |
| d, Delay for Lane Group [s/veh] | 50.03 | 47.41 | 60.05 | 40.32 | 56.69 | 59.83 | 34.50 | 39.28 | 63.63 | 40.28 | 34.83 |
| Lane Group LOS | D | D | E | D | E | E | C | D | E | D | C |
| Critical Lane Group | No | No | Yes | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 3.07 | 1.35 | 6.74 | 5.74 | 13.12 | 5.39 | 14.92 | 16.52 | 4.99 | 19.06 | 12.68 |
| 50th-Percentile Queue Length [ft/ln] | 76.87 | 33.73 | 168.56 | 143.43 | 328.04 | 134.85 | 372.91 | 413.05 | 124.86 | 476.45 | 317.00 |
| 95th-Percentile Queue Length [veh/ln] | 5.53 | 2.43 | 11.00 | 9.67 | 19.06 | 9.20 | 21.25 | 23.19 | 8.66 | 26.22 | 18.52 |
| 95th-Percentile Queue Length [ft/ln] | 138.36 | 60.71 | 275.02 | 241.64 | 476.56 | 230.07 | 531.26 | 579.70 | 216.49 | 655.43 | 463.00 |

**Movement, Approach, & Intersection Results**

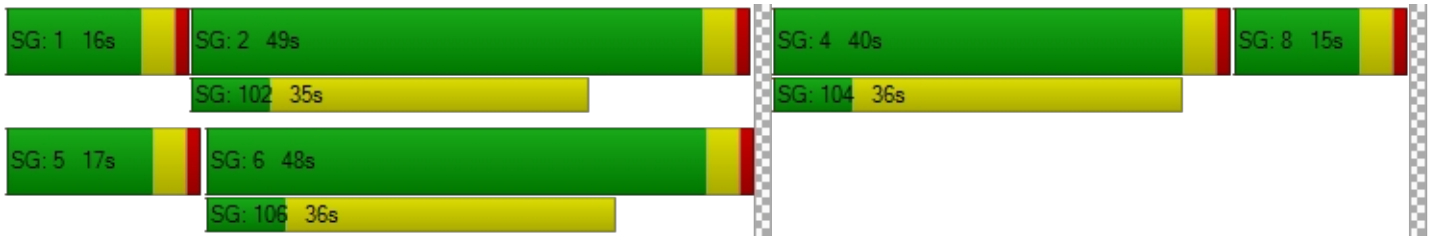
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 50.03 | 47.41 | 60.05 | 40.32 | 56.69 | 56.69 | 59.83 | 36.00 | 39.28 | 63.63 | 40.28 | 34.83 |
| Movement LOS | D | D | E | D | E | E | E | D | D | E | D | C |
| d_A, Approach Delay [s/veh] | 55.42 | | | 48.15 | | | 39.96 | | | 40.59 | | |
| Approach LOS | E | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 42.35 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.888 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.309 | 2.651 | 3.289 | 0.000 |
| Crosswalk LOS | B | B | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 183 | 600 | 750 | 733 |
| d_b, Bicycle Delay [s] | 49.52 | 29.41 | 23.45 | 24.08 |
| l_b,int, Bicycle LOS Score for Intersection | 1.861 | 2.954 | 2.709 | 3.014 |
| Bicycle LOS | A | C | B | C |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 134.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | F |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.369 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 326 | 655 | 780 | 617 | 442 | 195 | 146 | 1770 | 239 | 699 | 2190 | 1155 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 326 | 655 | 780 | 617 | 442 | 195 | 146 | 1770 | 239 | 699 | 2190 | 1155 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 82 | 164 | 195 | 154 | 111 | 49 | 37 | 443 | 60 | 175 | 548 | 289 |
| Total Analysis Volume [veh/h] | 326 | 655 | 780 | 617 | 442 | 195 | 146 | 1770 | 239 | 699 | 2190 | 1155 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 28 | 41 | 0 | 26 | 39 | 0 | 10 | 34 | 0 | 19 | 43 | 43 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 23 | 0 | 0 | 23 | 23 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 14 | 37 | 37 | 22 | 45 | 45 | 6 | 30 | 30 | 15 | 39 | 65 |
| g / C, Green / Cycle | 0.11 | 0.31 | 0.31 | 0.18 | 0.38 | 0.38 | 0.05 | 0.25 | 0.25 | 0.13 | 0.33 | 0.54 |
| (v / s)_i Volume / Saturation Flow Rate | 0.09 | 0.17 | 0.41 | 0.31 | 0.18 | 0.16 | 0.04 | 0.26 | 0.27 | 0.20 | 0.38 | 0.61 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 2000 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 399 | 1166 | 583 | 367 | 715 | 715 | 176 | 1433 | 478 | 438 | 1859 | 1032 |
| d1, Uniform Delay [s] | 51.96 | 34.85 | 41.61 | 49.01 | 28.34 | 27.78 | 56.48 | 44.93 | 44.93 | 52.50 | 40.44 | 27.43 |
| k, delay calibration | 0.11 | 0.11 | 0.50 | 0.17 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.16 | 0.43 | 163.63 | 310.94 | 0.48 | 0.40 | 9.46 | 37.12 | 59.84 | 270.11 | 86.04 | 66.99 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.82 | 0.56 | 1.34 | 1.68 | 0.47 | 0.42 | 0.83 | 1.05 | 1.07 | 1.60 | 1.18 | 1.12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 56.12 | 35.28 | 205.23 | 359.95 | 28.81 | 28.18 | 65.94 | 82.05 | 104.77 | 322.62 | 126.48 | 94.42 |
| Lane Group LOS | E | D | F | F | C | C | E | F | F | F | F | F |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 5.02 | 8.06 | 43.47 | 21.31 | 7.35 | 6.52 | 2.42 | 19.02 | 22.03 | 23.02 | 32.84 | 47.12 |
| 50th-Percentile Queue Length [ft/ln] | 125.56 | 201.59 | 1086.85 | 532.73 | 183.72 | 162.98 | 60.60 | 475.43 | 550.77 | 575.61 | 820.88 | 1177.92 |
| 95th-Percentile Queue Length [veh/ln] | 8.70 | 12.72 | 64.07 | 35.00 | 11.79 | 10.71 | 4.36 | 26.90 | 30.89 | 36.34 | 46.82 | 63.91 |
| 95th-Percentile Queue Length [ft/ln] | 217.44 | 318.02 | 1601.84 | 875.06 | 294.87 | 267.67 | 109.09 | 672.51 | 772.30 | 908.62 | 1170.51 | 1597.80 |

**Movement, Approach, & Intersection Results**

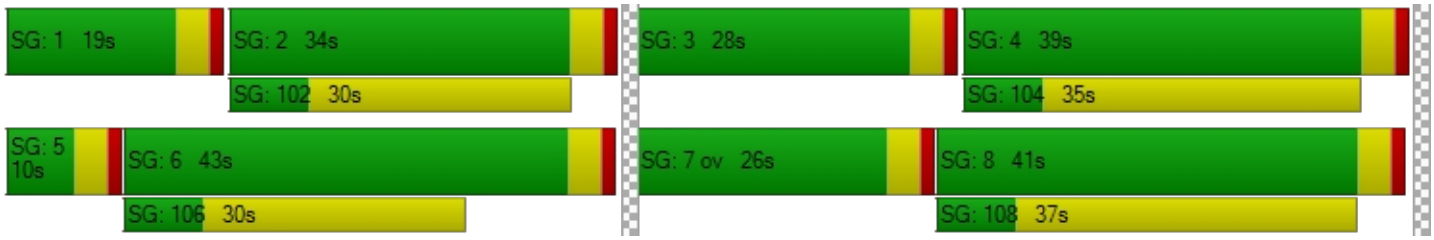
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 56.12 | 35.28 | 205.23 | 359.95 | 28.66 | 28.18 | 65.94 | 85.52 | 104.77 | 322.62 | 126.48 | 94.42 |
| Movement LOS | E | D | F | F | C | C | E | F | F | F | F | F |
| d_A, Approach Delay [s/veh] | 114.42 | | | 191.59 | | | 86.33 | | | 151.23 | | |
| Approach LOS | F | | | F | | | F | | | F | | |
| d_I, Intersection Delay [s/veh] | 134.51 | | | | | | | | | | | |
| Intersection LOS | F | | | | | | | | | | | |
| Intersection V/C | 1.369 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.51 | 49.51 | 49.51 | 49.51 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.045 | 2.988 | 3.390 | 3.683 |
| Crosswalk LOS | C | C | C | D |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 617 | 583 | 500 | 650 |
| d_b, Bicycle Delay [s] | 28.71 | 30.11 | 33.76 | 27.34 |
| l_b,int, Bicycle LOS Score for Intersection | 3.012 | 2.594 | 2.449 | 3.784 |
| Bicycle LOS | C | B | B | D |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 20.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.838 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 581 | 0 | 831 | 0 | 2335 | 1242 | 0 | 2860 | 367 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 581 | 0 | 831 | 0 | 2335 | 1242 | 0 | 2860 | 367 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 145 | 0 | 208 | 0 | 584 | 311 | 0 | 715 | 92 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 581 | 0 | 831 | 0 | 2335 | 1242 | 0 | 2860 | 367 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_di, Inbound Pedestrian Volume crossing m | | 0 | | | 0 | | | 0 | | | 0 | |
| v_co, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ci, Inbound Pedestrian Volume crossing mi | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ab, Corner Pedestrian Volume [ped/h] | | 0 | | | 0 | | | 0 | | | 0 | |
| Bicycle Volume [bicycles/h] | | 0 | | | 0 | | | 0 | | | 0 | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 8.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 74 | 0 | 0 | 0 | 26 | 0 | 0 | 26 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | | No | |
| Maximum Recall | | | | No | | | | No | | | No | |
| Pedestrian Recall | | | | No | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | C | R | C | C |
|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 32 | 32 | 32 | 60 | 60 |
| g / C, Green / Cycle | | 0.32 | 0.32 | 0.32 | 0.60 | 0.60 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.27 | 0.27 | 0.25 | 0.41 | 0.50 |
| s, saturation flow rate [veh/h] | | 1750 | 1750 | 1900 | 5700 | 5700 |
| c, Capacity [veh/h] | | 553 | 553 | 601 | 3441 | 3441 |
| d1, Uniform Delay [s] | | 31.94 | 31.94 | 31.04 | 13.28 | 15.74 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 3.79 | 3.79 | 2.29 | 1.10 | 2.49 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.85 | 0.85 | 0.78 | 0.68 | 0.83 |
| d, Delay for Lane Group [s/veh] | | 35.73 | 35.73 | 33.33 | 14.38 | 18.23 |
| Lane Group LOS | | D | D | C | B | B |
| Critical Lane Group | | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | | 10.94 | 10.94 | 10.45 | 11.06 | 16.34 |
| 50th-Percentile Queue Length [ft/ln] | | 273.51 | 273.51 | 261.19 | 276.58 | 408.57 |
| 95th-Percentile Queue Length [veh/ln] | | 16.36 | 16.36 | 15.75 | 16.52 | 22.97 |
| 95th-Percentile Queue Length [ft/ln] | | 409.12 | 409.12 | 393.71 | 412.95 | 574.31 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 35.73 | 0.00 | 34.37 | 0.00 | 14.38 | 0.00 | 0.00 | 18.23 | 0.00 |
| Movement LOS | | | | D | | C | | B | | | B | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 34.93 | | | 14.38 | | | 18.23 | | |
| Approach LOS | A | | | C | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 20.44 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.838 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 0.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 0.00 | 39.57 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 0.000 | 2.480 | 0.000 | 0.000 |
| Crosswalk LOS | F | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 1401 | 440 | 440 |
| d_b, Bicycle Delay [s] | 49.97 | 4.48 | 30.39 | 30.39 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 3.889 | 2.844 | 3.133 |
| Bicycle LOS | D | D | C | C |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 42.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.947 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1568 | 117 | 638 | 0 | 0 | 371 | 388 | 2085 | 690 | 0 | 2220 | 60 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1568 | 117 | 638 | 0 | 0 | 371 | 388 | 2085 | 690 | 0 | 2220 | 60 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 392 | 29 | 160 | 0 | 0 | 93 | 97 | 521 | 173 | 0 | 555 | 15 |
| Total Analysis Volume [veh/h] | 1568 | 117 | 638 | 0 | 0 | 371 | 388 | 2085 | 690 | 0 | 2220 | 60 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 0 | 6 | 6 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 47 | 0 | 0 | 0 | 32 | 32 | 73 | 0 | 0 | 41 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | | No | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | | No | No | No | | | No | |
| Maximum Recall | | No | | | | No | No | No | | | No | |
| Pedestrian Recall | | No | | | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 43 | 43 | 43 | 28 | 28 | 69 | 38 | 38 |
| g / C, Green / Cycle | 0.36 | 0.36 | 0.36 | 0.23 | 0.23 | 0.58 | 0.32 | 0.32 |
| (v / s)_i Volume / Saturation Flow Rate | 0.33 | 0.34 | 0.31 | 0.10 | 0.22 | 0.37 | 0.30 | 0.30 |
| s, saturation flow rate [veh/h] | 3500 | 1750 | 1900 | 3800 | 1800 | 5700 | 5700 | 1900 |
| c, Capacity [veh/h] | 1242 | 621 | 674 | 872 | 413 | 3297 | 1799 | 600 |
| d1, Uniform Delay [s] | 37.08 | 37.63 | 36.18 | 39.45 | 45.38 | 16.80 | 40.13 | 40.13 |
| k, delay calibration | 0.11 | 0.42 | 0.36 | 0.11 | 0.35 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 3.35 | 22.73 | 11.26 | 0.33 | 24.70 | 0.93 | 12.38 | 26.42 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.92 | 0.95 | 0.87 | 0.43 | 0.94 | 0.63 | 0.95 | 0.95 |
| d, Delay for Lane Group [s/veh] | 40.44 | 60.36 | 47.43 | 39.78 | 70.07 | 17.74 | 52.51 | 66.55 |
| Lane Group LOS | D | E | D | D | E | B | D | E |
| Critical Lane Group | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 16.40 | 20.45 | 18.00 | 4.72 | 14.10 | 12.52 | 18.29 | 20.63 |
| 50th-Percentile Queue Length [ft/ln] | 410.00 | 511.37 | 450.11 | 118.10 | 352.61 | 313.10 | 457.33 | 515.78 |
| 95th-Percentile Queue Length [veh/ln] | 23.04 | 27.87 | 24.96 | 8.29 | 20.26 | 18.33 | 25.31 | 28.08 |
| 95th-Percentile Queue Length [ft/ln] | 576.04 | 696.81 | 624.08 | 207.21 | 506.59 | 458.19 | 632.69 | 702.01 |

**Movement, Approach, & Intersection Results**

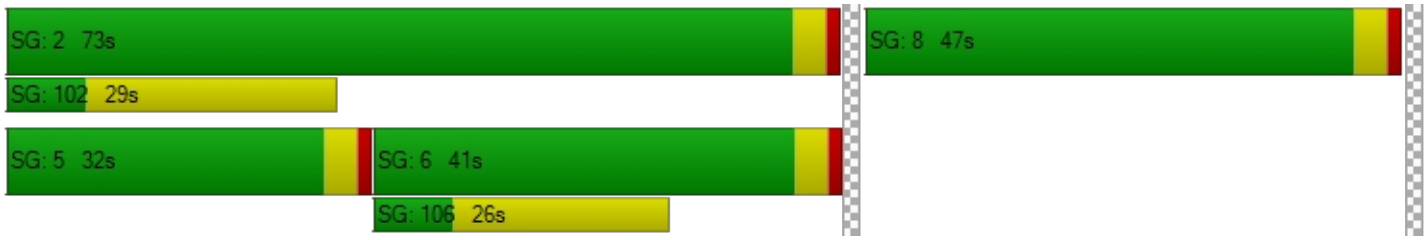
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 45.72 | 60.36 | 48.59 | 0.00 | 0.00 | 39.78 | 70.07 | 17.74 | 0.00 | 0.00 | 55.74 | 66.55 |
| Movement LOS | D | E | D | | | D | E | B | | | E | E |
| d_A, Approach Delay [s/veh] | 47.27 | | | 39.78 | | | 25.95 | | | 56.02 | | |
| Approach LOS | D | | | D | | | C | | | E | | |
| d_I, Intersection Delay [s/veh] | 42.49 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.947 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.49 | 49.49 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.767 | 2.258 | 0.000 | 0.000 |
| Crosswalk LOS | C | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 717 | 467 | 1150 | 617 |
| d_b, Bicycle Delay [s] | 24.69 | 35.25 | 10.83 | 28.69 |
| l_b,int, Bicycle LOS Score for Intersection | 5.393 | 1.560 | 2.920 | 2.500 |
| Bicycle LOS | F | A | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 35.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.827 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 260 | 198 | 141 | 320 | 254 | 203 | 253 | 2001 | 265 | 191 | 1835 | 227 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 260 | 198 | 141 | 320 | 254 | 203 | 253 | 2001 | 265 | 191 | 1835 | 227 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 65 | 50 | 35 | 80 | 64 | 51 | 63 | 500 | 66 | 48 | 459 | 57 |
| Total Analysis Volume [veh/h] | 260 | 198 | 141 | 320 | 254 | 203 | 253 | 2001 | 265 | 191 | 1835 | 227 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 14 | 39 | 0 | 17 | 42 | 0 | 28 | 45 | 0 | 19 | 36 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 29 | 0 | 0 | 26 | 0 | 0 | 25 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 10 | 16 | 16 | 13 | 19 | 19 | 19 | 61 | 61 | 15 | 56 | 56 |
| g / C, Green / Cycle | 0.08 | 0.13 | 0.13 | 0.11 | 0.16 | 0.16 | 0.16 | 0.51 | 0.51 | 0.12 | 0.47 | 0.47 |
| (v / s)_i Volume / Saturation Flow Rate | 0.07 | 0.09 | 0.08 | 0.09 | 0.13 | 0.11 | 0.14 | 0.39 | 0.40 | 0.11 | 0.27 | 0.28 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 294 | 253 | 253 | 375 | 297 | 297 | 283 | 1919 | 960 | 219 | 2675 | 892 |
| d1, Uniform Delay [s] | 54.42 | 49.85 | 49.25 | 52.66 | 49.33 | 47.85 | 49.60 | 24.29 | 24.63 | 51.84 | 23.15 | 23.37 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.13 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 8.72 | 3.72 | 2.57 | 5.53 | 7.00 | 2.78 | 11.21 | 3.25 | 6.89 | 10.41 | 0.90 | 2.85 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.88 | 0.71 | 0.63 | 0.85 | 0.86 | 0.68 | 0.89 | 0.78 | 0.80 | 0.87 | 0.57 | 0.59 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 63.14 | 53.57 | 51.82 | 58.19 | 56.33 | 50.63 | 60.81 | 27.54 | 31.52 | 62.25 | 24.06 | 26.22 |
| Lane Group LOS | E | D | D | E | E | D | E | C | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 4.24 | 5.44 | 4.69 | 5.02 | 7.98 | 5.97 | 8.31 | 17.72 | 19.28 | 6.28 | 10.60 | 11.44 |
| 50th-Percentile Queue Length [ft/ln] | 106.03 | 136.00 | 117.36 | 125.59 | 199.54 | 149.22 | 207.63 | 442.90 | 481.92 | 156.91 | 264.98 | 286.01 |
| 95th-Percentile Queue Length [veh/ln] | 7.62 | 9.27 | 8.25 | 8.70 | 12.61 | 9.98 | 13.03 | 24.62 | 26.48 | 10.39 | 15.94 | 16.99 |
| 95th-Percentile Queue Length [ft/ln] | 190.47 | 231.63 | 206.19 | 217.49 | 315.37 | 249.38 | 325.79 | 615.47 | 661.93 | 259.63 | 398.46 | 424.68 |

**Movement, Approach, & Intersection Results**

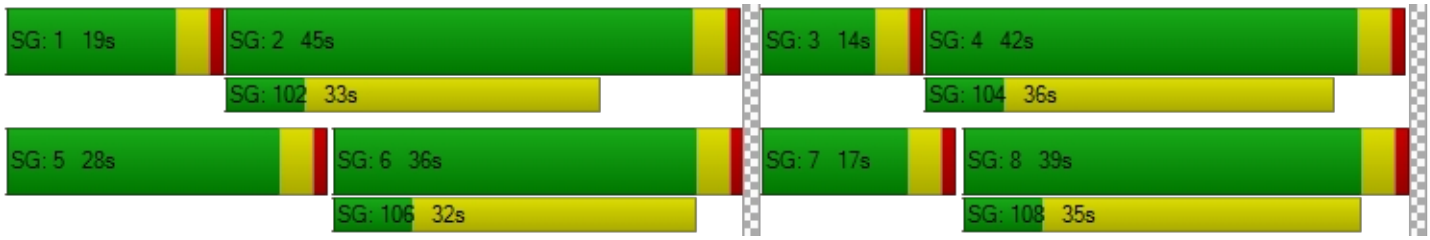
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 63.14 | 53.41 | 51.82 | 58.19 | 56.33 | 50.63 | 60.81 | 28.54 | 31.52 | 62.25 | 24.41 | 26.22 |
| Movement LOS | E | D | D | E | E | D | E | C | C | E | C | C |
| d_A, Approach Delay [s/veh] | 57.26 | | | 55.61 | | | 32.09 | | | 27.80 | | |
| Approach LOS | E | | | E | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 35.94 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.827 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 49.52 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.569 | 2.703 | 3.326 | 3.314 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 583 | 633 | 683 | 533 |
| d_b, Bicycle Delay [s] | 30.12 | 28.03 | 26.02 | 32.28 |
| l_b,int, Bicycle LOS Score for Intersection | 2.054 | 2.842 | 2.945 | 2.489 |
| Bicycle LOS | B | C | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 23.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.807 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 206 | 18 | 276 | 28 | 12 | 13 | 26 | 2142 | 314 | 228 | 2171 | 50 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 206 | 18 | 276 | 28 | 12 | 13 | 26 | 2142 | 314 | 228 | 2171 | 50 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 52 | 5 | 69 | 7 | 3 | 3 | 7 | 536 | 79 | 57 | 543 | 13 |
| Total Analysis Volume [veh/h] | 206 | 18 | 276 | 28 | 12 | 13 | 26 | 2142 | 314 | 228 | 2171 | 50 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 26 | 0 | 0 | 10 | 0 | 10 | 32 | 0 | 22 | 44 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 14 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 16 | 16 | 16 | 4 | 4 | 3 | 41 | 41 | 13 | 51 | 51 |
| g / C, Green / Cycle | 0.17 | 0.17 | 0.17 | 0.05 | 0.05 | 0.03 | 0.45 | 0.45 | 0.15 | 0.57 | 0.57 |
| (v / s)_i Volume / Saturation Flow Rate | 0.06 | 0.06 | 0.15 | 0.02 | 0.01 | 0.01 | 0.38 | 0.17 | 0.13 | 0.38 | 0.40 |
| s, saturation flow rate [veh/h] | 1750 | 1750 | 1900 | 1800 | 1900 | 1800 | 5700 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 304 | 304 | 330 | 90 | 96 | 60 | 2562 | 854 | 268 | 2148 | 1074 |
| d1, Uniform Delay [s] | 32.88 | 32.90 | 36.02 | 41.31 | 41.21 | 42.76 | 21.89 | 16.37 | 37.38 | 13.83 | 14.22 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.74 | 0.75 | 5.59 | 1.91 | 1.44 | 4.88 | 3.43 | 1.22 | 7.37 | 1.75 | 3.97 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.37 | 0.37 | 0.84 | 0.31 | 0.26 | 0.43 | 0.84 | 0.37 | 0.85 | 0.68 | 0.71 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 33.62 | 33.65 | 41.60 | 43.23 | 42.65 | 47.64 | 25.32 | 17.59 | 44.75 | 15.59 | 18.19 |
| Lane Group LOS | C | C | D | D | D | D | C | B | D | B | B |
| Critical Lane Group | No | No | Yes | Yes | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.18 | 2.20 | 6.26 | 0.64 | 0.57 | 0.64 | 13.24 | 4.38 | 5.36 | 9.96 | 11.31 |
| 50th-Percentile Queue Length [ft/ln] | 54.58 | 55.03 | 156.47 | 16.06 | 14.19 | 16.10 | 330.99 | 109.41 | 133.99 | 248.91 | 282.69 |
| 95th-Percentile Queue Length [veh/ln] | 3.93 | 3.96 | 10.36 | 1.16 | 1.02 | 1.16 | 19.21 | 7.81 | 9.16 | 15.13 | 16.82 |
| 95th-Percentile Queue Length [ft/ln] | 98.24 | 99.06 | 259.04 | 28.91 | 25.54 | 28.97 | 480.18 | 195.18 | 228.90 | 378.28 | 420.56 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 33.63 | 33.65 | 41.60 | 43.23 | 42.65 | 42.65 | 47.64 | 25.32 | 17.59 | 44.75 | 16.44 | 18.19 |
| Movement LOS | C | C | D | D | D | D | D | C | B | D | B | B |
| d_A, Approach Delay [s/veh] | 38.03 | | | 42.95 | | | 24.58 | | | 19.11 | | |
| Approach LOS | D | | | D | | | C | | | B | | |
| d_I, Intersection Delay [s/veh] | 23.54 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.807 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.72 | 34.72 | 0.00 | 34.72 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.388 | 1.988 | 0.000 | 3.275 |
| Crosswalk LOS | B | A | F | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 488 | 133 | 622 | 888 |
| d_b, Bicycle Delay [s] | 25.73 | 39.24 | 21.40 | 13.92 |
| l_b,int, Bicycle LOS Score for Intersection | 2.385 | 1.647 | 2.925 | 2.907 |
| Bicycle LOS | B | A | C | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



*APPENDIX D-VI*

# YEAR 2045 PLUS PROJECT TRAFFIC CONDITIONS

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 HCM Network.vistro
Report File: N:\...\AM 2045+P.pdf

Scenario 13 AM 2045+P
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | HCM 6th Edition | NB Thru | 0.898 | 40.2 | D |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | HCM 6th Edition | WB Left | 0.840 | 24.4 | C |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | HCM 6th Edition | NB Left | 0.884 | 22.1 | C |
| 4 | Randolph Avenue at Birch Street | Signalized | HCM 6th Edition | WB Left | 0.353 | 14.4 | B |
| 5 | State College Boulevard at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.648 | 40.5 | D |
| 6 | S Associated Road at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.781 | 26.8 | C |
| 7 | Randolph Avenue at Madison Way | Signalized | HCM 6th Edition | SB Left | 0.108 | 14.5 | B |
| 8 | Randolph Avenue at Brea Mall | Signalized | HCM 6th Edition | EB Left | 0.149 | 13.5 | B |
| 9 | Brea Mall South at State College Boulevard | Signalized | HCM 6th Edition | WB Left | 0.282 | 17.1 | B |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | HCM 6th Edition | NB Left | 1.029 | 58.2 | E |
| 11 | Puente Street at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.669 | 21.2 | C |
| 12 | Brea Boulevard at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.948 | 46.9 | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.550 | 15.1 | B |
| 14 | State College Boulevard at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.867 | 37.5 | D |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.690 | 15.9 | B |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | HCM 6th Edition | NB Thru | 0.688 | 25.4 | C |
| 17 | Associated Road at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.846 | 33.3 | C |
| 18 | Castlegate Lane/Placentia | Signalized | HCM 6th | EB Left | 0.737 | 18.8 | B |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | Edition | EB Left | 0.757 | 18.8 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 40.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.898 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 194 | 250 | 235 | 1011 | 691 | 9 | 16 | 1594 | 238 | 541 | 2035 | 627 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 194 | 250 | 235 | 1011 | 691 | 9 | 16 | 1594 | 238 | 541 | 2035 | 627 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 49 | 63 | 59 | 253 | 173 | 2 | 4 | 399 | 60 | 135 | 509 | 157 |
| Total Analysis Volume [veh/h] | 194 | 250 | 235 | 1011 | 691 | 9 | 16 | 1594 | 238 | 541 | 2035 | 627 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 13 | 16 | 0 | 41 | 44 | 0 | 14 | 39 | 0 | 24 | 49 | 49 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 28 | 0 | 0 | 22 | 22 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 9 | 12 | 12 | 12 | 37 | 40 | 40 | 3 | 35 | 35 | 20 | 52 | 93 |
| g / C, Green / Cycle | 0.07 | 0.10 | 0.10 | 0.10 | 0.31 | 0.34 | 0.34 | 0.02 | 0.29 | 0.29 | 0.17 | 0.44 | 0.78 |
| (v / s)_i Volume / Saturation Flow Rate | 0.06 | 0.09 | 0.08 | 0.08 | 0.29 | 0.18 | 0.18 | 0.00 | 0.24 | 0.24 | 0.15 | 0.36 | 0.33 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1900 | 3500 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 252 | 197 | 197 | 197 | 1068 | 641 | 641 | 76 | 1657 | 552 | 584 | 2486 | 1472 |
| d1, Uniform Delay [s] | 54.75 | 53.07 | 52.66 | 52.34 | 40.75 | 32.34 | 32.32 | 57.73 | 39.76 | 39.88 | 49.28 | 29.69 | 4.55 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.13 | 0.13 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.97 | 12.07 | 7.87 | 5.94 | 5.28 | 0.85 | 0.84 | 1.37 | 4.88 | 13.89 | 6.91 | 3.15 | 0.90 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.77 | 0.88 | 0.81 | 0.76 | 0.95 | 0.55 | 0.55 | 0.21 | 0.83 | 0.83 | 0.93 | 0.82 | 0.43 |
| d, Delay for Lane Group [s/veh] | 59.72 | 65.15 | 60.53 | 58.28 | 46.04 | 33.19 | 33.17 | 59.10 | 44.64 | 53.76 | 56.19 | 32.84 | 5.46 |
| Lane Group LOS | E | E | E | E | D | C | C | E | D | D | E | C | A |
| Critical Lane Group | No | Yes | No | No | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 3.06 | 5.84 | 5.17 | 4.73 | 15.20 | 8.41 | 8.39 | 0.25 | 13.23 | 14.77 | 8.53 | 17.49 | 4.68 |
| 50th-Percentile Queue Length [ft/ln] | 76.41 | 146.0 | 129.2 | 118.2 | 380.04 | 210.19 | 209.66 | 6.34 | 330.73 | 369.23 | 213.16 | 437.19 | 116.93 |
| 95th-Percentile Queue Length [veh/ln] | 5.50 | 9.81 | 8.90 | 8.30 | 21.60 | 13.16 | 13.14 | 0.46 | 19.19 | 21.07 | 13.32 | 24.35 | 8.22 |
| 95th-Percentile Queue Length [ft/ln] | 137.5 | 245.1 | 222.4 | 207.3 | 539.89 | 329.07 | 328.40 | 11.41 | 479.85 | 526.80 | 332.88 | 608.64 | 205.61 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 59.72 | 63.75 | 59.02 | 46.04 | 33.18 | 33.17 | 59.10 | 45.92 | 53.76 | 56.19 | 32.84 | 5.46 |
| Movement LOS | E | E | E | D | C | C | E | D | D | E | C | A |
| d_A, Approach Delay [s/veh] | 60.99 | | | 40.78 | | | 47.04 | | | 31.42 | | |
| Approach LOS | E | | | D | | | D | | | C | | |
| d_I, Intersection Delay [s/veh] | 40.15 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.898 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.907 | 2.890 | 3.306 | 0.000 |
| Crosswalk LOS | C | C | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 200 | 666 | 583 | 750 |
| d_b, Bicycle Delay [s] | 48.62 | 26.68 | 30.12 | 23.45 |
| l_b,int, Bicycle LOS Score for Intersection | 2.120 | 2.971 | 2.322 | 3.321 |
| Bicycle LOS | B | C | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 24.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.840 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 1084 | 0 | 730 | 0 | 1953 | 650 | 285 | 2286 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 1084 | 0 | 730 | 0 | 1953 | 650 | 285 | 2286 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 271 | 0 | 183 | 0 | 488 | 163 | 71 | 572 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 1084 | 0 | 730 | 0 | 1953 | 650 | 285 | 2286 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 95 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 44 | 0 | 0 | 0 | 38 | 0 | 13 | 51 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 20 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | No | No | |
| Maximum Recall | | | | No | | | | No | | No | No | |
| Pedestrian Recall | | | | No | | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | R | C | R | L | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 95 | 95 | 95 | 95 | 95 | 95 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 34 | 34 | 40 | 40 | 9 | 53 |
| g / C, Green / Cycle | | 0.36 | 0.36 | 0.42 | 0.42 | 0.10 | 0.56 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.31 | 0.19 | 0.34 | 0.17 | 0.08 | 0.40 |
| s, saturation flow rate [veh/h] | | 3500 | 3800 | 5700 | 3800 | 3500 | 5700 |
| c, Capacity [veh/h] | | 1262 | 1370 | 2380 | 1587 | 335 | 3165 |
| d1, Uniform Delay [s] | | 28.14 | 24.05 | 24.52 | 19.44 | 42.31 | 15.69 |
| k, delay calibration | | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 1.82 | 0.32 | 3.32 | 0.78 | 6.13 | 1.46 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.86 | 0.53 | 0.82 | 0.41 | 0.85 | 0.72 |
| d, Delay for Lane Group [s/veh] | | 29.97 | 24.37 | 27.84 | 20.23 | 48.44 | 17.15 |
| Lane Group LOS | | C | C | C | C | D | B |
| Critical Lane Group | | Yes | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | | 11.31 | 6.38 | 13.09 | 5.06 | 3.54 | 11.69 |
| 50th-Percentile Queue Length [ft/ln] | | 282.68 | 159.59 | 327.16 | 126.60 | 88.55 | 292.28 |
| 95th-Percentile Queue Length [veh/ln] | | 16.82 | 10.53 | 19.02 | 8.75 | 6.38 | 17.30 |
| 95th-Percentile Queue Length [ft/ln] | | 420.55 | 263.18 | 475.48 | 218.87 | 159.39 | 432.47 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 29.97 | 0.00 | 24.37 | 0.00 | 27.84 | 20.23 | 48.44 | 17.15 | 0.00 |
| Movement LOS | | | | C | | C | | C | C | D | B | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 27.71 | | | 25.94 | | | 20.62 | | |
| Approach LOS | A | | | C | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 24.44 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.840 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 37.14 | 37.14 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.173 | 2.576 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 842 | 716 | 989 |
| d_b, Bicycle Delay [s] | 47.51 | 15.93 | 19.59 | 12.13 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 1.560 | 2.991 | 2.974 |
| Bicycle LOS | D | A | C | C |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 22.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.884 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | | | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | | | | No | | | No | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1104 | 0 | 534 | 0 | 0 | 0 | 0 | 2605 | 424 | 0 | 1458 | 530 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1104 | 0 | 534 | 0 | 0 | 0 | 0 | 2605 | 424 | 0 | 1458 | 530 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 276 | 0 | 134 | 0 | 0 | 0 | 0 | 651 | 106 | 0 | 365 | 0 |
| Total Analysis Volume [veh/h] | 1104 | 0 | 534 | 0 | 0 | 0 | 0 | 2605 | 424 | 0 | 1458 | 0 |
| Presence of On-Street Parking | No | | No | | | | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 95 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 59 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 36 | 0 |
| Vehicle Extension [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | No | | | | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | | | | | | | No | | | No | |
| Maximum Recall | No | | | | | | | No | | | No | |
| Pedestrian Recall | No | | | | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | R | | C | C | R | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 95 | 95 | | 95 | 95 | 95 | 95 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 35 | 35 | | 51 | 51 | 51 | 51 |
| g / C, Green / Cycle | 0.37 | 0.37 | | 0.54 | 0.54 | 0.54 | 0.54 |
| (v / s)_i Volume / Saturation Flow Rate | 0.32 | 0.28 | | 0.46 | 0.46 | 0.22 | 0.26 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | | 3800 | 1900 | 1900 | 5700 |
| c, Capacity [veh/h] | 1306 | 709 | | 2062 | 1031 | 1031 | 3093 |
| d1, Uniform Delay [s] | 27.24 | 25.93 | | 18.28 | 18.28 | 12.78 | 13.34 |
| k, delay calibration | 0.11 | 0.11 | | 0.50 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.59 | 1.65 | | 4.39 | 8.35 | 1.21 | 0.52 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.85 | 0.75 | | 0.84 | 0.84 | 0.41 | 0.47 |
| d, Delay for Lane Group [s/veh] | 28.83 | 27.58 | | 22.68 | 26.63 | 13.99 | 13.86 |
| Lane Group LOS | C | C | | C | C | B | B |
| Critical Lane Group | Yes | No | | Yes | No | No | No |
| 50th-Percentile Queue Length [veh/ln] | 11.29 | 10.46 | | 15.95 | 17.08 | 5.36 | 6.15 |
| 50th-Percentile Queue Length [ft/ln] | 282.19 | 261.41 | | 398.77 | 427.07 | 134.06 | 153.71 |
| 95th-Percentile Queue Length [veh/ln] | 16.80 | 15.76 | | 22.50 | 23.86 | 9.16 | 10.21 |
| 95th-Percentile Queue Length [ft/ln] | 419.93 | 393.99 | | 562.51 | 596.53 | 229.00 | 255.37 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 28.83 | 0.00 | 27.58 | 0.00 | 0.00 | 0.00 | 0.00 | 23.56 | 13.99 | 0.00 | 13.86 | 0.00 |
| Movement LOS | C | | C | | | | | C | B | | B | |
| d_A, Approach Delay [s/veh] | 28.42 | | | 0.00 | | | 22.59 | | | 13.86 | | |
| Approach LOS | C | | | A | | | C | | | B | | |
| d_I, Intersection Delay [s/veh] | 22.07 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.884 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 0.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 37.11 | 0.00 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.704 | 0.000 | 0.000 | 0.000 |
| Crosswalk LOS | B | F | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1159 | 0 | 674 | 674 |
| d_b, Bicycle Delay [s] | 8.40 | 47.47 | 20.87 | 20.87 |
| l_b,int, Bicycle LOS Score for Intersection | 1.560 | 4.132 | 3.226 | 2.362 |
| Bicycle LOS | A | D | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 14.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.353 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 36 | 46 | 101 | 86 | 39 | 37 | 43 | 656 | 108 | 85 | 597 | 61 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 36 | 46 | 101 | 86 | 39 | 37 | 43 | 656 | 108 | 85 | 597 | 61 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 9 | 12 | 25 | 22 | 10 | 9 | 11 | 164 | 27 | 21 | 149 | 15 |
| Total Analysis Volume [veh/h] | 36 | 46 | 101 | 86 | 39 | 37 | 43 | 656 | 108 | 85 | 597 | 61 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 38 | 0 | 0 | 38 | 0 | 10 | 30 | 0 | 22 | 42 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 25 | 0 | 0 | 19 | 0 | 0 | 18 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 7 | 7 | 7 | 7 | 7 | 4 | 65 | 65 | 6 | 67 | 67 |
| g / C, Green / Cycle | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.04 | 0.73 | 0.73 | 0.06 | 0.74 | 0.74 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.02 | 0.05 | 0.05 | 0.04 | 0.02 | 0.21 | 0.20 | 0.05 | 0.16 | 0.03 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 119 | 149 | 149 | 146 | 149 | 81 | 1379 | 1379 | 112 | 2825 | 1412 |
| d1, Uniform Delay [s] | 39.03 | 39.20 | 40.39 | 40.17 | 39.84 | 42.06 | 4.26 | 4.21 | 41.54 | 3.52 | 3.07 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.42 | 1.16 | 5.32 | 3.74 | 2.69 | 5.26 | 0.52 | 0.48 | 9.83 | 0.17 | 0.06 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.30 | 0.31 | 0.68 | 0.59 | 0.51 | 0.53 | 0.28 | 0.27 | 0.76 | 0.21 | 0.04 |
| d, Delay for Lane Group [s/veh] | 40.45 | 40.36 | 45.72 | 43.91 | 42.54 | 47.32 | 4.77 | 4.69 | 51.37 | 3.69 | 3.12 |
| Lane Group LOS | D | D | D | D | D | D | A | A | D | A | A |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.79 | 1.00 | 2.37 | 1.97 | 1.71 | 1.04 | 2.14 | 2.02 | 2.14 | 1.31 | 0.24 |
| 50th-Percentile Queue Length [ft/ln] | 19.70 | 24.98 | 59.30 | 49.34 | 42.71 | 26.10 | 53.57 | 50.39 | 53.56 | 32.76 | 6.10 |
| 95th-Percentile Queue Length [veh/ln] | 1.42 | 1.80 | 4.27 | 3.55 | 3.08 | 1.88 | 3.86 | 3.63 | 3.86 | 2.36 | 0.44 |
| 95th-Percentile Queue Length [ft/ln] | 35.46 | 44.96 | 106.74 | 88.82 | 76.88 | 46.99 | 96.43 | 90.71 | 96.41 | 58.97 | 10.97 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 40.45 | 40.36 | 45.72 | 43.91 | 42.54 | 42.54 | 47.32 | 4.74 | 4.69 | 51.37 | 3.69 | 3.12 |
| Movement LOS | D | D | D | D | D | D | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 43.34 | | | 43.26 | | | 7.00 | | | 9.10 | | |
| Approach LOS | D | | | D | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 14.43 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.353 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.232 | 2.041 | 2.639 | 2.832 |
| Crosswalk LOS | B | B | B | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 755 | 755 | 578 | 844 |
| d_b, Bicycle Delay [s] | 17.43 | 17.43 | 22.77 | 15.03 |
| l_b,int, Bicycle LOS Score for Intersection | 1.862 | 1.827 | 2.225 | 2.173 |
| Bicycle LOS | A | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 40.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.648 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 88 | 176 | 118 | 776 | 974 | 254 | 125 | 582 | 68 | 104 | 664 | 338 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 88 | 176 | 118 | 776 | 974 | 254 | 125 | 582 | 68 | 104 | 664 | 338 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 22 | 44 | 30 | 194 | 244 | 64 | 31 | 146 | 17 | 26 | 166 | 85 |
| Total Analysis Volume [veh/h] | 88 | 176 | 118 | 776 | 974 | 254 | 125 | 582 | 68 | 104 | 664 | 338 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 10 | 39 | 0 | 32 | 61 | 0 | 11 | 39 | 0 | 10 | 38 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 20 | 20 | 28 | 42 | 42 | 6 | 50 | 50 | 6 | 50 | 50 |
| g / C, Green / Cycle | 0.05 | 0.17 | 0.17 | 0.23 | 0.35 | 0.35 | 0.05 | 0.42 | 0.42 | 0.05 | 0.41 | 0.41 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.05 | 0.06 | 0.22 | 0.32 | 0.32 | 0.04 | 0.15 | 0.04 | 0.03 | 0.17 | 0.18 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 3500 | 1900 | 1900 | 3500 | 3800 | 1900 | 3500 | 3800 | 1900 |
| c, Capacity [veh/h] | 168 | 639 | 320 | 816 | 671 | 671 | 182 | 1581 | 791 | 172 | 1571 | 785 |
| d1, Uniform Delay [s] | 55.79 | 43.56 | 44.29 | 45.34 | 37.09 | 37.09 | 55.96 | 24.17 | 21.23 | 55.93 | 25.03 | 25.13 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.23 | 0.23 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 2.50 | 0.23 | 0.71 | 6.96 | 10.42 | 10.42 | 4.58 | 0.66 | 0.21 | 3.38 | 0.84 | 1.72 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.52 | 0.28 | 0.37 | 0.95 | 0.91 | 0.91 | 0.69 | 0.37 | 0.09 | 0.60 | 0.42 | 0.43 |
| d, Delay for Lane Group [s/veh] | 58.29 | 43.79 | 45.00 | 52.30 | 47.51 | 47.51 | 60.54 | 24.83 | 21.44 | 59.30 | 25.87 | 26.85 |
| Lane Group LOS | E | D | D | D | D | D | E | C | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | 1.36 | 2.31 | 3.19 | 12.10 | 18.89 | 18.89 | 1.98 | 5.84 | 1.21 | 1.63 | 6.88 | 7.22 |
| 50th-Percentile Queue Length [ft/ln] | 34.03 | 57.87 | 79.78 | 302.39 | 472.15 | 472.15 | 49.46 | 145.90 | 30.37 | 40.65 | 172.03 | 180.52 |
| 95th-Percentile Queue Length [veh/ln] | 2.45 | 4.17 | 5.74 | 17.80 | 26.01 | 26.01 | 3.56 | 9.80 | 2.19 | 2.93 | 11.18 | 11.63 |
| 95th-Percentile Queue Length [ft/ln] | 61.26 | 104.17 | 143.61 | 444.98 | 650.33 | 650.33 | 89.02 | 244.95 | 54.67 | 73.16 | 279.57 | 290.70 |

**Movement, Approach, & Intersection Results**

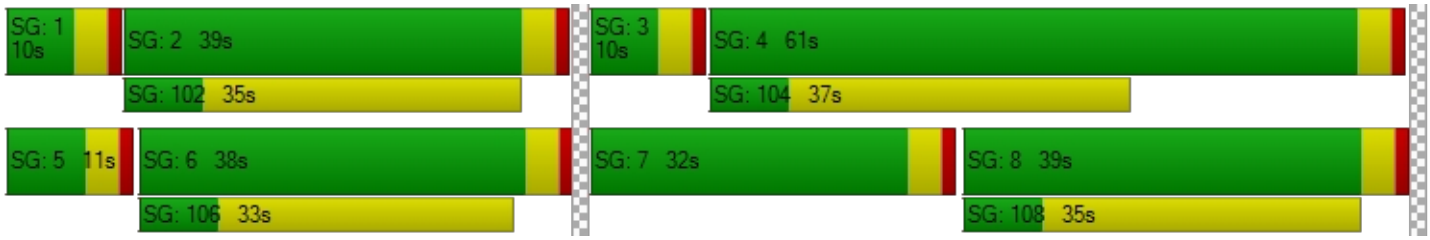
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 58.29 | 43.79 | 45.00 | 52.30 | 47.51 | 47.51 | 60.54 | 24.83 | 21.44 | 59.30 | 25.87 | 26.85 |
| Movement LOS | E | D | D | D | D | D | E | C | C | E | C | C |
| d_A, Approach Delay [s/veh] | 47.50 | | | 49.37 | | | 30.30 | | | 29.31 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 40.54 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.648 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 49.52 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.821 | 2.896 | 2.856 | 2.967 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 583 | 950 | 583 | 567 |
| d_b, Bicycle Delay [s] | 30.12 | 16.55 | 30.12 | 30.83 |
| l_b,int, Bicycle LOS Score for Intersection | 1.875 | 3.213 | 2.199 | 2.472 |
| Bicycle LOS | A | C | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 26.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.781 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 286 | 7 | 364 | 63 | 34 | 11 | 5 | 1105 | 374 | 405 | 898 | 11 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 286 | 7 | 364 | 63 | 34 | 11 | 5 | 1105 | 374 | 405 | 898 | 11 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 72 | 2 | 91 | 16 | 9 | 3 | 1 | 276 | 94 | 101 | 225 | 3 |
| Total Analysis Volume [veh/h] | 286 | 7 | 364 | 63 | 34 | 11 | 5 | 1105 | 374 | 405 | 898 | 11 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 6 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 30 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 23 | 60 | 60 | 0 | 37 | 0 | 10 | 38 | 0 | 22 | 50 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 7 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 26 | 0 | 26 | 0 | 0 | 27 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | No | | No | | No | No | | No | No | |
| Maximum Recall | No | No | No | | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | No | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 12 | 22 | 44 | 6 | 6 | 1 | 68 | 68 | 18 | 85 | 85 |
| g / C, Green / Cycle | 0.10 | 0.19 | 0.37 | 0.05 | 0.05 | 0.01 | 0.56 | 0.56 | 0.15 | 0.71 | 0.71 |
| (v / s)_i Volume / Saturation Flow Rate | 0.08 | 0.00 | 0.19 | 0.04 | 0.02 | 0.00 | 0.40 | 0.38 | 0.12 | 0.24 | 0.24 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 |
| c, Capacity [veh/h] | 353 | 353 | 701 | 120 | 98 | 15 | 1072 | 1072 | 525 | 1342 | 1342 |
| d1, Uniform Delay [s] | 52.82 | 39.94 | 29.54 | 55.96 | 55.31 | 59.20 | 19.05 | 18.29 | 49.03 | 6.82 | 6.81 |
| k, delay calibration | 0.11 | 0.11 | 0.28 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.43 | 0.02 | 1.54 | 3.55 | 3.35 | 13.08 | 4.03 | 3.30 | 2.44 | 0.69 | 0.68 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.81 | 0.02 | 0.52 | 0.53 | 0.46 | 0.34 | 0.71 | 0.67 | 0.77 | 0.34 | 0.34 |
| d, Delay for Lane Group [s/veh] | 57.26 | 39.96 | 31.08 | 59.51 | 58.66 | 72.29 | 23.08 | 21.58 | 51.46 | 7.51 | 7.49 |
| Lane Group LOS | E | D | C | E | E | E | C | C | D | A | A |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 4.44 | 0.17 | 8.47 | 1.99 | 1.42 | 0.20 | 16.05 | 14.34 | 6.01 | 4.39 | 4.36 |
| 50th-Percentile Queue Length [ft/ln] | 110.91 | 4.32 | 211.87 | 49.86 | 35.40 | 5.12 | 401.16 | 358.45 | 150.15 | 109.66 | 109.11 |
| 95th-Percentile Queue Length [veh/ln] | 7.89 | 0.31 | 13.25 | 3.59 | 2.55 | 0.37 | 22.62 | 20.55 | 10.03 | 7.82 | 7.79 |
| 95th-Percentile Queue Length [ft/ln] | 197.27 | 7.77 | 331.23 | 89.76 | 63.71 | 9.21 | 565.39 | 513.69 | 250.63 | 195.52 | 194.77 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 57.26 | 39.96 | 31.08 | 59.51 | 58.66 | 58.66 | 72.29 | 22.62 | 21.58 | 51.46 | 7.50 | 7.49 |
| Movement LOS | E | D | C | E | E | E | E | C | C | D | A | A |
| d_A, Approach Delay [s/veh] | 42.57 | | | 59.15 | | | 22.53 | | | 21.05 | | |
| Approach LOS | D | | | E | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 26.79 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.781 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.51 | 49.51 | 49.51 | 49.51 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.706 | 1.997 | 2.836 | 3.019 |
| Crosswalk LOS | B | A | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 933 | 550 | 567 | 767 |
| d_b, Bicycle Delay [s] | 17.07 | 31.54 | 30.82 | 22.82 |
| l_b,int, Bicycle LOS Score for Intersection | 2.644 | 1.738 | 2.784 | 2.644 |
| Bicycle LOS | B | A | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 14.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.108 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 28 | 161 | 9 | 6 | 148 | 18 | 36 | 3 | 62 | 0 | 0 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 28 | 161 | 9 | 6 | 148 | 18 | 36 | 3 | 62 | 0 | 0 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 40 | 2 | 2 | 37 | 5 | 9 | 1 | 16 | 0 | 0 | 0 |
| Total Analysis Volume [veh/h] | 28 | 161 | 9 | 6 | 148 | 18 | 36 | 3 | 62 | 0 | 0 | 0 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 17 | 48 | 0 | 10 | 41 | 0 | 0 | 32 | 0 | 0 | 32 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 12 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | L | C | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 3 | 72 | 72 | 1 | 69 | 69 | 6 | 6 | 6 | 6 |
| g / C, Green / Cycle | 0.03 | 0.79 | 0.79 | 0.01 | 0.77 | 0.77 | 0.06 | 0.06 | 0.06 | 0.06 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.04 | 0.04 | 0.00 | 0.04 | 0.04 | 0.02 | 0.03 | 0.00 | 0.00 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 63 | 1508 | 1508 | 19 | 1462 | 1462 | 158 | 119 | 100 | 119 |
| d1, Uniform Delay [s] | 42.61 | 2.01 | 2.00 | 44.22 | 2.50 | 2.50 | 40.39 | 40.98 | 0.00 | 0.00 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.92 | 0.07 | 0.07 | 9.13 | 0.07 | 0.07 | 0.72 | 3.90 | 0.00 | 0.00 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.45 | 0.06 | 0.06 | 0.32 | 0.06 | 0.06 | 0.23 | 0.55 | 0.00 | 0.00 |
| d, Delay for Lane Group [s/veh] | 47.53 | 2.08 | 2.08 | 53.35 | 2.58 | 2.57 | 41.11 | 44.89 | 0.00 | 0.00 |
| Lane Group LOS | D | A | A | D | A | A | D | D | A | A |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.69 | 0.23 | 0.23 | 0.18 | 0.28 | 0.28 | 0.79 | 1.51 | 0.00 | 0.00 |
| 50th-Percentile Queue Length [ft/ln] | 17.26 | 5.76 | 5.72 | 4.50 | 6.98 | 6.89 | 19.69 | 37.83 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [veh/ln] | 1.24 | 0.41 | 0.41 | 0.32 | 0.50 | 0.50 | 1.42 | 2.72 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln] | 31.07 | 10.37 | 10.30 | 8.10 | 12.57 | 12.41 | 35.44 | 68.10 | 0.00 | 0.00 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 47.53 | 2.08 | 2.08 | 53.35 | 2.57 | 2.57 | 41.11 | 44.89 | 44.89 | 0.00 | 0.00 | 0.00 |
| Movement LOS | D | A | A | D | A | A | D | D | D | A | A | A |
| d_A, Approach Delay [s/veh] | 8.50 | | | 4.35 | | | 43.54 | | | 0.00 | | |
| Approach LOS | A | | | A | | | D | | | A | | |
| d_I, Intersection Delay [s/veh] | 14.50 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.108 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.379 | 2.423 | 1.987 | 1.946 |
| Crosswalk LOS | B | B | A | A |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 978 | 822 | 622 | 622 |
| d_b, Bicycle Delay [s] | 11.76 | 15.62 | 21.37 | 21.37 |
| l_b,int, Bicycle LOS Score for Intersection | 1.723 | 1.702 | 1.726 | 1.560 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 13.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.149 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 14 | 190 | 132 | 28 | 166 | 6 | 1 | 0 | 1 | 117 | 0 | 22 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 14 | 190 | 132 | 28 | 166 | 6 | 1 | 0 | 1 | 117 | 0 | 22 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 48 | 33 | 7 | 42 | 2 | 0 | 0 | 0 | 29 | 0 | 6 |
| Total Analysis Volume [veh/h] | 14 | 190 | 132 | 28 | 166 | 6 | 1 | 0 | 1 | 117 | 0 | 22 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 29 | 0 | 10 | 29 | 0 | 0 | 30 | 0 | 0 | 31 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 17 | 0 | 0 | 18 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | C | R | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 0.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 82 | 74 | 74 | 82 | 76 | 76 | 0 | 0 | 6 | 6 |
| g / C, Green / Cycle | 0.82 | 0.74 | 0.74 | 0.82 | 0.76 | 0.76 | 0.00 | 0.00 | 0.06 | 0.06 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.09 | 0.08 | 0.02 | 0.05 | 0.05 | 0.00 | 0.00 | 0.04 | 0.04 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 1547 | 1412 | 1412 | 1522 | 1437 | 1437 | 7 | 7 | 108 | 114 |
| d1, Uniform Delay [s] | 1.70 | 3.62 | 3.59 | 1.72 | 3.11 | 3.11 | 49.68 | 49.68 | 45.99 | 45.86 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.00 | 0.17 | 0.16 | 0.02 | 0.08 | 0.08 | 9.31 | 8.30 | 6.38 | 5.03 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.01 | 0.12 | 0.11 | 0.02 | 0.06 | 0.06 | 0.14 | 0.14 | 0.65 | 0.60 |
| d, Delay for Lane Group [s/veh] | 1.71 | 3.79 | 3.75 | 1.74 | 3.19 | 3.19 | 58.99 | 57.98 | 52.37 | 50.89 |
| Lane Group LOS | A | A | A | A | A | A | E | E | D | D |
| Critical Lane Group | No | Yes | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.03 | 0.85 | 0.77 | 0.07 | 0.38 | 0.38 | 0.04 | 0.04 | 1.89 | 1.82 |
| 50th-Percentile Queue Length [ft/ln] | 0.80 | 21.14 | 19.31 | 1.81 | 9.53 | 9.48 | 1.07 | 1.04 | 47.21 | 45.48 |
| 95th-Percentile Queue Length [veh/ln] | 0.06 | 1.52 | 1.39 | 0.13 | 0.69 | 0.68 | 0.08 | 0.07 | 3.40 | 3.27 |
| 95th-Percentile Queue Length [ft/ln] | 1.45 | 38.05 | 34.75 | 3.25 | 17.15 | 17.07 | 1.92 | 1.87 | 84.98 | 81.87 |

**Movement, Approach, & Intersection Results**

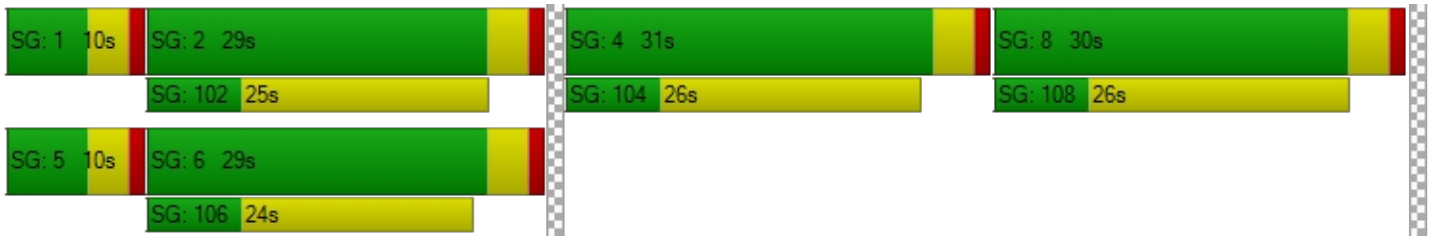
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 1.71 | 3.79 | 3.75 | 1.74 | 3.19 | 3.19 | 58.99 | 58.99 | 57.98 | 51.78 | 50.89 | 50.89 |
| Movement LOS | A | A | A | A | A | A | E | E | E | D | D | D |
| d_A, Approach Delay [s/veh] | 3.69 | | | 2.99 | | | 58.48 | | | 51.64 | | |
| Approach LOS | A | | | A | | | E | | | D | | |
| d_I, Intersection Delay [s/veh] | 13.49 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.149 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 39.62 | 39.62 | 39.62 | 39.62 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.426 | 2.385 | 1.968 | 2.073 |
| Crosswalk LOS | B | B | A | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 500 | 500 | 520 | 540 |
| d_b, Bicycle Delay [s] | 28.14 | 28.14 | 27.40 | 26.66 |
| l_b,int, Bicycle LOS Score for Intersection | 1.837 | 1.725 | 1.563 | 1.789 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 17.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.282 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 34 | 9 | 17 | 17 | 6 | 67 | 153 | 283 | 17 | 30 | 512 | 29 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 34 | 9 | 17 | 17 | 6 | 67 | 153 | 283 | 17 | 30 | 512 | 29 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 9 | 2 | 4 | 4 | 2 | 17 | 38 | 71 | 4 | 8 | 128 | 7 |
| Total Analysis Volume [veh/h] | 34 | 9 | 17 | 17 | 6 | 67 | 153 | 283 | 17 | 30 | 512 | 29 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 6 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 30 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 37 | 0 | 0 | 10 | 10 | 21 | 42 | 0 | 11 | 32 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 21 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | No | No | No | | No | No | |
| Maximum Recall | | No | | | No | No | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | No | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | C | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 5 | 5 | 5 | 6 | 6 | 25 | 7 | 70 | 70 | 3 | 67 | 67 |
| g / C, Green / Cycle | 0.05 | 0.05 | 0.05 | 0.06 | 0.06 | 0.25 | 0.07 | 0.70 | 0.70 | 0.03 | 0.67 | 0.67 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.02 | 0.01 | 0.01 | 0.00 | 0.04 | 0.04 | 0.08 | 0.08 | 0.02 | 0.14 | 0.14 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 1900 | 1900 |
| c, Capacity [veh/h] | 131 | 151 | 95 | 101 | 107 | 480 | 234 | 1329 | 1329 | 63 | 1268 | 1268 |
| d1, Uniform Delay [s] | 45.51 | 46.01 | 45.62 | 45.04 | 44.75 | 28.99 | 45.58 | 4.92 | 4.91 | 47.40 | 6.46 | 6.45 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.29 | 0.67 | 0.90 | 0.78 | 0.22 | 0.13 | 3.07 | 0.17 | 0.17 | 5.43 | 0.39 | 0.38 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.09 | 0.21 | 0.18 | 0.17 | 0.06 | 0.14 | 0.65 | 0.11 | 0.11 | 0.47 | 0.21 | 0.21 |
| d, Delay for Lane Group [s/veh] | 45.80 | 46.68 | 46.52 | 45.82 | 44.97 | 29.12 | 48.65 | 5.09 | 5.08 | 52.83 | 6.85 | 6.83 |
| Lane Group LOS | D | D | D | D | D | C | D | A | A | D | A | A |
| Critical Lane Group | No | Yes | No | No | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.29 | 0.78 | 0.43 | 0.42 | 0.15 | 1.26 | 1.94 | 0.96 | 0.94 | 0.83 | 2.15 | 2.11 |
| 50th-Percentile Queue Length [ft/ln] | 7.24 | 19.41 | 10.69 | 10.57 | 3.68 | 31.57 | 48.62 | 23.90 | 23.53 | 20.65 | 53.72 | 52.74 |
| 95th-Percentile Queue Length [veh/ln] | 0.52 | 1.40 | 0.77 | 0.76 | 0.26 | 2.27 | 3.50 | 1.72 | 1.69 | 1.49 | 3.87 | 3.80 |
| 95th-Percentile Queue Length [ft/ln] | 13.04 | 34.93 | 19.24 | 19.03 | 6.62 | 56.82 | 87.52 | 43.02 | 42.35 | 37.18 | 96.69 | 94.93 |

**Movement, Approach, & Intersection Results**

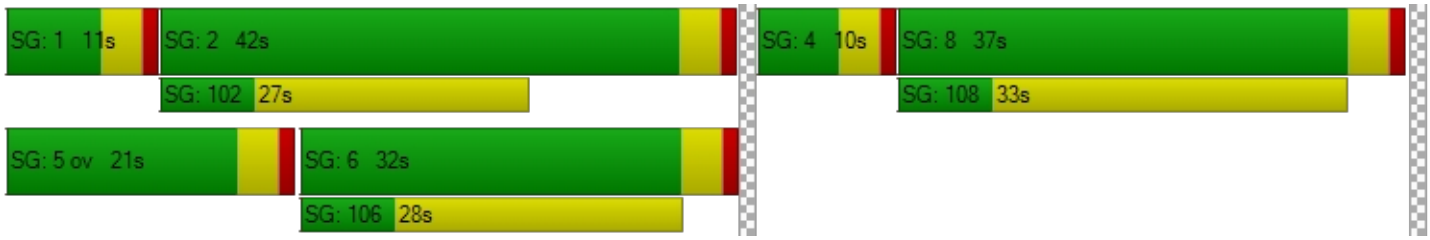
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 46.33 | 46.68 | 46.52 | 45.82 | 44.97 | 29.12 | 48.65 | 5.09 | 5.08 | 52.83 | 6.84 | 6.83 |
| Movement LOS | D | D | D | D | D | C | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 46.46 | | | 33.33 | | | 19.80 | | | 9.26 | | |
| Approach LOS | D | | | C | | | B | | | A | | |
| d_I, Intersection Delay [s/veh] | 17.07 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.282 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 39.64 | 39.64 | 0.00 | 39.64 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.327 | 2.360 | 0.000 | 2.478 |
| Crosswalk LOS | B | B | F | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 660 | 120 | 759 | 560 |
| d_b, Bicycle Delay [s] | 22.48 | 44.22 | 19.25 | 25.95 |
| l_b,int, Bicycle LOS Score for Intersection | 1.659 | 1.634 | 1.933 | 2.031 |
| Bicycle LOS | A | A | A | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 58.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | E |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.029 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 387 | 773 | 293 | 184 | 1484 | 334 | 303 | 1482 | 759 | 424 | 1327 | 279 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 387 | 773 | 293 | 184 | 1484 | 334 | 303 | 1482 | 759 | 424 | 1327 | 279 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 97 | 193 | 73 | 46 | 371 | 84 | 76 | 371 | 190 | 106 | 332 | 70 |
| Total Analysis Volume [veh/h] | 387 | 773 | 293 | 184 | 1484 | 334 | 303 | 1482 | 759 | 424 | 1327 | 279 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 16 | 43 | 0 | 12 | 39 | 0 | 16 | 47 | 0 | 18 | 49 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 31 | 0 | 0 | 28 | 0 | 0 | 31 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 12 | 38 | 38 | 8 | 34 | 34 | 12 | 44 | 44 | 14 | 46 | 46 |
| g / C, Green / Cycle | 0.10 | 0.32 | 0.32 | 0.07 | 0.28 | 0.28 | 0.10 | 0.37 | 0.37 | 0.12 | 0.38 | 0.38 |
| (v / s)_i Volume / Saturation Flow Rate | 0.11 | 0.14 | 0.15 | 0.05 | 0.26 | 0.18 | 0.09 | 0.39 | 0.40 | 0.12 | 0.23 | 0.15 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 351 | 1806 | 602 | 235 | 1617 | 539 | 351 | 1390 | 695 | 409 | 2180 | 727 |
| d1, Uniform Delay [s] | 54.00 | 32.40 | 33.11 | 55.14 | 41.64 | 37.36 | 53.19 | 38.06 | 38.06 | 53.00 | 29.83 | 26.82 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.16 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 56.06 | 0.16 | 0.61 | 5.70 | 2.52 | 1.77 | 6.35 | 43.84 | 61.88 | 30.76 | 1.27 | 1.53 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 1.10 | 0.43 | 0.49 | 0.78 | 0.92 | 0.62 | 0.86 | 1.07 | 1.09 | 1.04 | 0.61 | 0.38 |
| d, Delay for Lane Group [s/veh] | 110.06 | 32.56 | 33.72 | 60.84 | 44.15 | 39.13 | 59.54 | 81.89 | 99.94 | 83.76 | 31.10 | 28.36 |
| Lane Group LOS | F | C | C | E | D | D | E | F | F | F | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 8.02 | 5.95 | 6.98 | 2.93 | 14.40 | 8.76 | 4.81 | 28.50 | 31.98 | 7.90 | 10.47 | 6.10 |
| 50th-Percentile Queue Length [ft/ln] | 200.51 | 148.67 | 174.55 | 73.16 | 360.02 | 219.06 | 120.17 | 712.49 | 799.59 | 197.51 | 261.85 | 152.62 |
| 95th-Percentile Queue Length [veh/ln] | 13.14 | 9.95 | 11.32 | 5.27 | 20.62 | 13.62 | 8.40 | 38.96 | 43.86 | 12.69 | 15.78 | 10.16 |
| 95th-Percentile Queue Length [ft/ln] | 328.40 | 248.66 | 282.89 | 131.70 | 515.61 | 340.42 | 210.06 | 974.02 | 1096.48 | 317.36 | 394.55 | 253.92 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 110.06 | 32.56 | 33.72 | 60.84 | 44.15 | 39.13 | 59.54 | 81.89 | 99.94 | 83.76 | 31.10 | 28.36 |
| Movement LOS | F | C | C | E | D | D | E | F | F | F | C | C |
| d_A, Approach Delay [s/veh] | 53.43 | | | 44.85 | | | 84.62 | | | 41.72 | | |
| Approach LOS | D | | | D | | | F | | | D | | |
| d_I, Intersection Delay [s/veh] | 58.21 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |
| Intersection V/C | 1.029 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.51 | 49.51 | 49.51 | 49.51 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.309 | 3.227 | 3.299 | 3.295 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 650 | 583 | 717 | 750 |
| d_b, Bicycle Delay [s] | 27.34 | 30.11 | 24.71 | 23.44 |
| l_b,int, Bicycle LOS Score for Intersection | 2.359 | 2.661 | 2.959 | 2.676 |
| Bicycle LOS | B | B | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 21.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.669 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 64 | 124 | 169 | 300 | 121 | 263 | 246 | 1472 | 85 | 56 | 1577 | 195 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 64 | 124 | 169 | 300 | 121 | 263 | 246 | 1472 | 85 | 56 | 1577 | 195 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 16 | 31 | 42 | 75 | 30 | 66 | 62 | 368 | 21 | 14 | 394 | 49 |
| Total Analysis Volume [veh/h] | 64 | 124 | 169 | 300 | 121 | 263 | 246 | 1472 | 85 | 56 | 1577 | 195 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 39 | 0 | 0 | 39 | 0 | 17 | 31 | 0 | 20 | 34 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 23 | 0 | 0 | 17 | 0 | 0 | 23 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 18 | 18 | 18 | 18 | 18 | 18 | 13 | 56 | 56 | 5 | 47 | 47 |
| g / C, Green / Cycle | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.14 | 0.62 | 0.62 | 0.05 | 0.52 | 0.52 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.07 | 0.09 | 0.17 | 0.03 | 0.14 | 0.14 | 0.27 | 0.28 | 0.03 | 0.28 | 0.10 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 353 | 377 | 377 | 300 | 753 | 377 | 261 | 2345 | 1172 | 92 | 2983 | 994 |
| d1, Uniform Delay [s] | 30.01 | 30.96 | 31.77 | 34.72 | 29.89 | 33.59 | 38.11 | 9.06 | 9.13 | 41.82 | 14.14 | 11.40 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.24 | 0.51 | 0.84 | 24.32 | 0.10 | 2.35 | 15.24 | 0.60 | 1.25 | 6.23 | 0.67 | 0.44 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.18 | 0.33 | 0.45 | 1.00 | 0.16 | 0.70 | 0.94 | 0.44 | 0.45 | 0.61 | 0.53 | 0.20 |
| d, Delay for Lane Group [s/veh] | 30.25 | 31.47 | 32.60 | 59.04 | 29.99 | 35.94 | 53.35 | 9.66 | 10.38 | 48.05 | 14.81 | 11.84 |
| Lane Group LOS | C | C | C | F | C | D | D | A | B | D | B | B |
| Critical Lane Group | No | No | No | Yes | No | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 1.16 | 2.33 | 3.27 | 8.20 | 1.08 | 5.49 | 6.38 | 4.91 | 5.27 | 1.37 | 6.74 | 2.08 |
| 50th-Percentile Queue Length [ft/ln] | 29.08 | 58.27 | 81.82 | 205.05 | 27.08 | 137.18 | 159.44 | 122.74 | 131.74 | 34.13 | 168.55 | 52.05 |
| 95th-Percentile Queue Length [veh/ln] | 2.09 | 4.20 | 5.89 | 12.90 | 1.95 | 9.33 | 10.52 | 8.54 | 9.03 | 2.46 | 11.00 | 3.75 |
| 95th-Percentile Queue Length [ft/ln] | 52.35 | 104.88 | 147.28 | 322.57 | 48.75 | 233.22 | 262.98 | 213.58 | 225.85 | 61.44 | 275.01 | 93.69 |

**Movement, Approach, & Intersection Results**

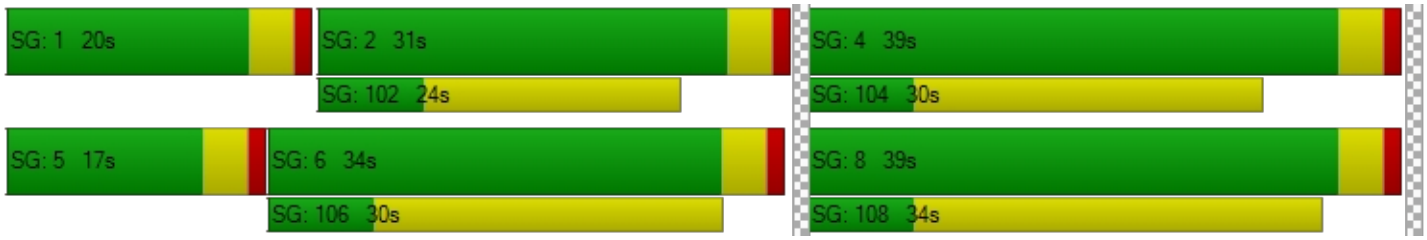
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 30.25 | 31.47 | 32.60 | 59.04 | 29.99 | 35.94 | 53.35 | 9.87 | 10.38 | 48.05 | 14.81 | 11.84 |
| Movement LOS | C | C | C | F | C | D | D | A | B | D | B | B |
| d_A, Approach Delay [s/veh] | 31.79 | | | 45.02 | | | 15.83 | | | 15.52 | | |
| Approach LOS | C | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 21.20 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.669 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.420 | 2.543 | 3.201 | 3.611 |
| Crosswalk LOS | B | B | C | D |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 778 | 778 | 600 | 666 |
| d_b, Bicycle Delay [s] | 16.82 | 16.82 | 22.06 | 20.01 |
| l_b,int, Bicycle LOS Score for Intersection | 2.149 | 2.124 | 2.551 | 2.565 |
| Bicycle LOS | B | B | B | B |

## Sequence

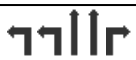
| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 46.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.948 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 473 | 581 | 203 | 181 | 1222 | 228 | 177 | 1715 | 395 | 223 | 1790 | 122 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 473 | 581 | 203 | 181 | 1222 | 228 | 177 | 1715 | 395 | 223 | 1790 | 122 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 118 | 145 | 51 | 45 | 306 | 57 | 44 | 429 | 99 | 56 | 448 | 31 |
| Total Analysis Volume [veh/h] | 473 | 581 | 203 | 181 | 1222 | 228 | 177 | 1715 | 395 | 223 | 1790 | 122 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 22 | 41 | 0 | 24 | 43 | 0 | 11 | 43 | 0 | 12 | 44 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 18 | 48 | 48 | 8 | 39 | 39 | 7 | 39 | 39 | 8 | 40 | 40 |
| g / C, Green / Cycle | 0.15 | 0.40 | 0.40 | 0.07 | 0.32 | 0.32 | 0.06 | 0.33 | 0.33 | 0.07 | 0.33 | 0.33 |
| (v / s)_i Volume / Saturation Flow Rate | 0.14 | 0.10 | 0.11 | 0.05 | 0.32 | 0.12 | 0.05 | 0.30 | 0.21 | 0.06 | 0.31 | 0.06 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 524 | 2299 | 766 | 246 | 1231 | 615 | 205 | 1860 | 620 | 234 | 1907 | 636 |
| d1, Uniform Delay [s] | 50.16 | 23.79 | 23.93 | 54.69 | 40.44 | 31.18 | 56.02 | 38.96 | 34.39 | 55.81 | 38.73 | 28.39 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 6.04 | 0.06 | 0.18 | 4.24 | 10.42 | 0.37 | 10.34 | 9.10 | 4.95 | 18.19 | 10.46 | 0.67 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.90 | 0.25 | 0.26 | 0.74 | 0.99 | 0.37 | 0.86 | 0.92 | 0.64 | 0.95 | 0.94 | 0.19 |
| d, Delay for Lane Group [s/veh] | 56.20 | 23.85 | 24.11 | 58.94 | 50.86 | 31.55 | 66.37 | 48.06 | 39.34 | 74.00 | 49.19 | 29.06 |
| Lane Group LOS | E | C | C | E | D | C | E | D | D | E | D | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 7.40 | 3.67 | 3.90 | 2.83 | 19.46 | 5.15 | 2.95 | 17.59 | 10.62 | 3.95 | 18.65 | 2.64 |
| 50th-Percentile Queue Length [ft/ln] | 185.06 | 91.87 | 97.48 | 70.69 | 486.55 | 128.75 | 73.78 | 439.72 | 265.58 | 98.81 | 466.21 | 65.92 |
| 95th-Percentile Queue Length [veh/ln] | 11.86 | 6.61 | 7.02 | 5.09 | 26.70 | 8.87 | 5.31 | 24.47 | 15.97 | 7.11 | 25.73 | 4.75 |
| 95th-Percentile Queue Length [ft/ln] | 296.61 | 165.36 | 175.46 | 127.25 | 667.43 | 221.80 | 132.80 | 611.68 | 399.21 | 177.85 | 643.27 | 118.66 |

**Movement, Approach, & Intersection Results**

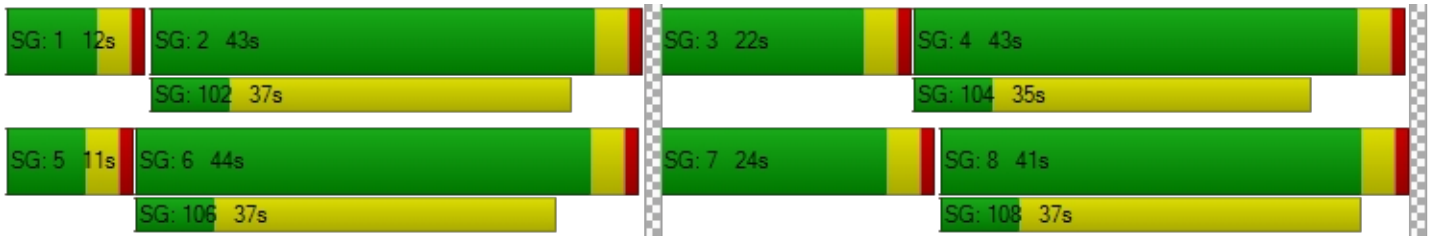
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 56.20 | 23.85 | 24.11 | 58.94 | 50.86 | 31.55 | 66.37 | 48.06 | 39.34 | 74.00 | 49.19 | 29.06 |
| Movement LOS | E | C | C | E | D | C | E | D | D | E | D | C |
| d_A, Approach Delay [s/veh] | 36.07 | | | 49.06 | | | 47.97 | | | 50.63 | | |
| Approach LOS | D | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 46.94 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.948 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.51 | 49.51 | 49.51 | 49.51 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.117 | 3.045 | 3.381 | 3.322 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 617 | 650 | 650 | 667 |
| d_b, Bicycle Delay [s] | 28.71 | 27.34 | 27.34 | 26.67 |
| l_b,int, Bicycle LOS Score for Intersection | 2.251 | 2.905 | 2.817 | 2.734 |
| Bicycle LOS | B | C | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 15.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.550 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 39 | 20 | 71 | 192 | 22 | 78 | 138 | 1742 | 27 | 43 | 1882 | 182 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 39 | 20 | 71 | 192 | 22 | 78 | 138 | 1742 | 27 | 43 | 1882 | 182 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 10 | 5 | 18 | 48 | 6 | 20 | 35 | 436 | 7 | 11 | 471 | 46 |
| Total Analysis Volume [veh/h] | 39 | 20 | 71 | 192 | 22 | 78 | 138 | 1742 | 27 | 43 | 1882 | 182 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 10 | 0 | 0 | 40 | 0 | 10 | 40 | 0 | 10 | 40 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 28 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 6 | 6 | 8 | 8 | 6 | 66 | 66 | 4 | 64 | 64 |
| g / C, Green / Cycle | 0.06 | 0.06 | 0.06 | 0.08 | 0.08 | 0.06 | 0.66 | 0.66 | 0.04 | 0.64 | 0.64 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.01 | 0.04 | 0.05 | 0.05 | 0.04 | 0.31 | 0.32 | 0.02 | 0.33 | 0.10 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 3500 | 1900 | 3500 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 107 | 107 | 113 | 287 | 156 | 209 | 2492 | 1246 | 77 | 3644 | 1215 |
| d1, Uniform Delay [s] | 45.29 | 44.81 | 46.03 | 44.64 | 44.53 | 46.10 | 8.55 | 8.71 | 46.98 | 9.73 | 7.21 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 2.08 | 0.84 | 5.68 | 2.68 | 4.34 | 3.56 | 0.63 | 1.36 | 6.10 | 0.53 | 0.26 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.37 | 0.19 | 0.63 | 0.67 | 0.64 | 0.66 | 0.47 | 0.49 | 0.56 | 0.52 | 0.15 |
| d, Delay for Lane Group [s/veh] | 47.37 | 45.64 | 51.71 | 47.31 | 48.87 | 49.65 | 9.18 | 10.07 | 53.08 | 10.26 | 7.47 |
| Lane Group LOS | D | D | D | D | D | D | A | B | D | B | A |
| Critical Lane Group | No | No | Yes | Yes | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.99 | 0.50 | 1.89 | 2.41 | 2.58 | 1.77 | 5.78 | 6.39 | 1.18 | 6.84 | 1.52 |
| 50th-Percentile Queue Length [ft/ln] | 24.74 | 12.39 | 47.37 | 60.17 | 64.45 | 44.36 | 144.60 | 159.72 | 29.42 | 170.93 | 37.98 |
| 95th-Percentile Queue Length [veh/ln] | 1.78 | 0.89 | 3.41 | 4.33 | 4.64 | 3.19 | 9.73 | 10.53 | 2.12 | 11.13 | 2.73 |
| 95th-Percentile Queue Length [ft/ln] | 44.53 | 22.30 | 85.26 | 108.31 | 116.01 | 79.86 | 243.21 | 263.35 | 52.95 | 278.13 | 68.37 |

**Movement, Approach, & Intersection Results**

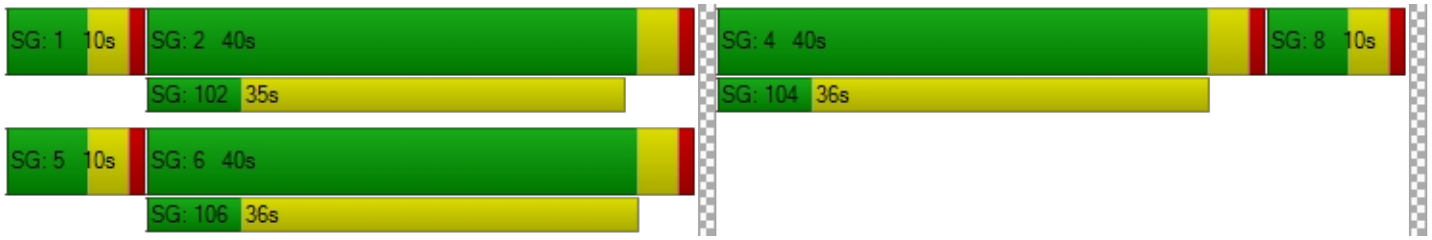
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 47.37 | 45.64 | 51.71 | 47.31 | 48.87 | 48.87 | 49.65 | 9.47 | 10.07 | 53.08 | 10.26 | 7.47 |
| Movement LOS | D | D | D | D | D | D | D | A | B | D | B | A |
| d_A, Approach Delay [s/veh] | 49.48 | | | 47.85 | | | 12.39 | | | 10.89 | | |
| Approach LOS | D | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 15.10 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.550 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 39.64 | 39.64 | 39.64 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.190 | 2.428 | 3.206 | 0.000 |
| Crosswalk LOS | B | B | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 120 | 719 | 719 | 719 |
| d_b, Bicycle Delay [s] | 44.22 | 20.51 | 20.51 | 20.51 |
| l_b,int, Bicycle LOS Score for Intersection | 1.667 | 2.041 | 2.608 | 2.718 |
| Bicycle LOS | A | B | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 37.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.867 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 125 | 186 | 479 | 151 | 502 | 33 | 37 | 1775 | 214 | 534 | 1953 | 203 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 125 | 186 | 479 | 151 | 502 | 33 | 37 | 1775 | 214 | 534 | 1953 | 203 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 31 | 47 | 120 | 38 | 126 | 8 | 9 | 444 | 54 | 134 | 488 | 51 |
| Total Analysis Volume [veh/h] | 125 | 186 | 479 | 151 | 502 | 33 | 37 | 1775 | 214 | 534 | 1953 | 203 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 115 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 14 | 42 | 0 | 14 | 42 | 0 | 10 | 36 | 0 | 23 | 49 | 49 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 23 | 0 | 0 | 23 | 23 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 6 | 31 | 31 | 10 | 35 | 35 | 4 | 39 | 39 | 19 | 53 | 67 |
| g / C, Green / Cycle | 0.05 | 0.27 | 0.27 | 0.09 | 0.31 | 0.31 | 0.04 | 0.33 | 0.33 | 0.17 | 0.46 | 0.59 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.05 | 0.25 | 0.08 | 0.14 | 0.14 | 0.01 | 0.26 | 0.27 | 0.15 | 0.34 | 0.11 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 2000 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 186 | 1038 | 519 | 175 | 585 | 585 | 130 | 1908 | 636 | 579 | 2640 | 1112 |
| d1, Uniform Delay [s] | 53.50 | 31.96 | 40.64 | 51.82 | 32.15 | 32.05 | 53.92 | 34.42 | 34.72 | 47.29 | 25.23 | 11.07 |
| k, delay calibration | 0.11 | 0.11 | 0.29 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.18 | 0.08 | 16.22 | 11.68 | 0.57 | 0.55 | 1.19 | 3.19 | 9.99 | 6.67 | 1.91 | 0.36 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.67 | 0.18 | 0.92 | 0.86 | 0.46 | 0.45 | 0.28 | 0.78 | 0.80 | 0.92 | 0.74 | 0.18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 57.68 | 32.04 | 56.86 | 63.50 | 32.72 | 32.60 | 55.11 | 37.60 | 44.71 | 53.96 | 27.14 | 11.43 |
| Lane Group LOS | E | C | E | E | C | C | E | D | D | D | C | B |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 1.88 | 2.00 | 15.36 | 2.43 | 6.15 | 6.01 | 0.54 | 12.83 | 14.45 | 8.03 | 14.59 | 2.47 |
| 50th-Percentile Queue Length [ft/ln] | 47.07 | 50.00 | 384.00 | 60.77 | 153.70 | 150.16 | 13.58 | 320.83 | 361.33 | 200.79 | 364.71 | 61.66 |
| 95th-Percentile Queue Length [veh/ln] | 3.39 | 3.60 | 21.79 | 4.38 | 10.21 | 10.03 | 0.98 | 18.71 | 20.69 | 12.68 | 20.85 | 4.44 |
| 95th-Percentile Queue Length [ft/ln] | 84.73 | 90.00 | 544.68 | 109.38 | 255.37 | 250.64 | 24.44 | 467.70 | 517.20 | 316.98 | 521.31 | 110.98 |

**Movement, Approach, & Intersection Results**

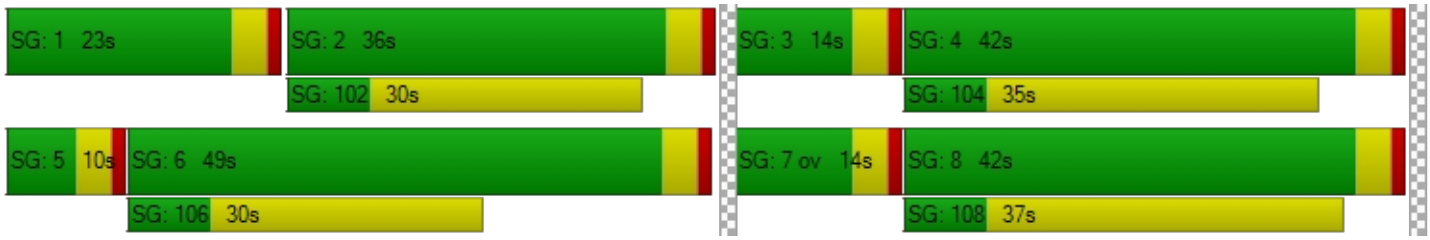
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 57.68 | 32.04 | 56.86 | 63.50 | 32.67 | 32.60 | 55.11 | 38.78 | 44.71 | 53.96 | 27.14 | 11.43 |
| Movement LOS | E | C | E | E | C | C | E | D | D | D | C | B |
| d_A, Approach Delay [s/veh] | 51.15 | | | 39.45 | | | 39.70 | | | 31.28 | | |
| Approach LOS | D | | | D | | | D | | | C | | |
| d_I, Intersection Delay [s/veh] | 37.48 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.867 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 47.05 | 47.05 | 47.05 | 47.05 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.890 | 2.645 | 3.309 | 3.475 |
| Crosswalk LOS | C | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 661 | 661 | 556 | 782 |
| d_b, Bicycle Delay [s] | 25.80 | 25.80 | 29.97 | 21.32 |
| l_b,int, Bicycle LOS Score for Intersection | 2.211 | 2.126 | 2.395 | 3.039 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 15.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.690 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 684 | 0 | 571 | 0 | 1739 | 828 | 0 | 2223 | 232 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 684 | 0 | 571 | 0 | 1739 | 828 | 0 | 2223 | 232 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 171 | 0 | 143 | 0 | 435 | 207 | 0 | 556 | 58 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 684 | 0 | 571 | 0 | 1739 | 828 | 0 | 2223 | 232 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_di, Inbound Pedestrian Volume crossing m | | 0 | | | 0 | | | 0 | | | 0 | |
| v_co, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ci, Inbound Pedestrian Volume crossing mi | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ab, Corner Pedestrian Volume [ped/h] | | 0 | | | 0 | | | 0 | | | 0 | |
| Bicycle Volume [bicycles/h] | | 0 | | | 0 | | | 0 | | | 0 | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 8.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 64 | 0 | 0 | 0 | 26 | 0 | 0 | 26 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | | No | |
| Maximum Recall | | | | No | | | | No | | | No | |
| Pedestrian Recall | | | | No | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | C | R | C | C |
|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 26 | 26 | 26 | 56 | 56 |
| g / C, Green / Cycle | | 0.29 | 0.29 | 0.29 | 0.62 | 0.62 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.24 | 0.24 | 0.22 | 0.31 | 0.39 |
| s, saturation flow rate [veh/h] | | 1750 | 1750 | 1900 | 5700 | 5700 |
| c, Capacity [veh/h] | | 502 | 502 | 544 | 3559 | 3559 |
| d1, Uniform Delay [s] | | 30.04 | 30.04 | 29.31 | 9.12 | 10.39 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 3.72 | 3.72 | 2.32 | 0.48 | 0.84 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.83 | 0.83 | 0.77 | 0.49 | 0.62 |
| d, Delay for Lane Group [s/veh] | | 33.76 | 33.76 | 31.63 | 9.60 | 11.23 |
| Lane Group LOS | | C | C | C | A | B |
| Critical Lane Group | | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | | 8.72 | 8.72 | 8.35 | 5.59 | 8.18 |
| 50th-Percentile Queue Length [ft/ln] | | 217.99 | 217.99 | 208.85 | 139.74 | 204.61 |
| 95th-Percentile Queue Length [veh/ln] | | 13.56 | 13.56 | 13.09 | 9.47 | 12.88 |
| 95th-Percentile Queue Length [ft/ln] | | 339.06 | 339.06 | 327.35 | 236.67 | 321.90 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 33.76 | 0.00 | 32.20 | 0.00 | 9.60 | 0.00 | 0.00 | 11.23 | 0.00 |
| Movement LOS | | | | C | | C | | A | | | B | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 33.05 | | | 9.60 | | | 11.23 | | |
| Approach LOS | A | | | C | | | A | | | B | | |
| d_I, Intersection Delay [s/veh] | 15.93 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.690 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 0.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 0.00 | 34.63 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 0.000 | 2.436 | 0.000 | 0.000 |
| Crosswalk LOS | F | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 1335 | 489 | 489 |
| d_b, Bicycle Delay [s] | 44.96 | 4.98 | 25.65 | 25.65 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 3.630 | 2.516 | 2.782 |
| Bicycle LOS | D | D | B | C |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 25.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.688 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1149 | 31 | 949 | 0 | 0 | 87 | 100 | 1552 | 635 | 0 | 1752 | 14 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1149 | 31 | 949 | 0 | 0 | 87 | 100 | 1552 | 635 | 0 | 1752 | 14 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 287 | 8 | 237 | 0 | 0 | 22 | 25 | 388 | 159 | 0 | 438 | 4 |
| Total Analysis Volume [veh/h] | 1149 | 31 | 949 | 0 | 0 | 87 | 100 | 1552 | 635 | 0 | 1752 | 14 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 0 | 6 | 6 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 33 | 0 | 0 | 0 | 11 | 11 | 57 | 0 | 0 | 46 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | | No | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | | No | No | No | | | No | |
| Maximum Recall | | No | | | | No | No | No | | | No | |
| Pedestrian Recall | | No | | | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 29 | 29 | 29 | 6 | 6 | 53 | 43 | 43 |
| g / C, Green / Cycle | 0.32 | 0.32 | 0.32 | 0.07 | 0.07 | 0.59 | 0.47 | 0.47 |
| (v / s)_i Volume / Saturation Flow Rate | 0.30 | 0.31 | 0.28 | 0.02 | 0.06 | 0.27 | 0.23 | 0.23 |
| s, saturation flow rate [veh/h] | 3500 | 1750 | 1900 | 3800 | 1800 | 5700 | 5700 | 1900 |
| c, Capacity [veh/h] | 1127 | 563 | 612 | 275 | 130 | 3359 | 2693 | 898 |
| d1, Uniform Delay [s] | 29.57 | 29.95 | 28.93 | 39.67 | 41.04 | 10.44 | 16.33 | 16.33 |
| k, delay calibration | 0.11 | 0.40 | 0.34 | 0.11 | 0.11 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.10 | 25.04 | 12.34 | 0.65 | 9.06 | 0.46 | 0.65 | 1.92 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.93 | 0.96 | 0.88 | 0.32 | 0.77 | 0.46 | 0.49 | 0.49 |
| d, Delay for Lane Group [s/veh] | 33.67 | 55.00 | 41.27 | 40.32 | 50.10 | 10.90 | 16.98 | 18.26 |
| Lane Group LOS | C | D | D | D | D | B | B | B |
| Critical Lane Group | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 11.18 | 14.91 | 12.72 | 0.93 | 2.48 | 5.40 | 6.08 | 6.40 |
| 50th-Percentile Queue Length [ft/ln] | 279.47 | 372.81 | 317.89 | 23.26 | 62.04 | 134.99 | 152.04 | 160.01 |
| 95th-Percentile Queue Length [veh/ln] | 16.66 | 21.25 | 18.56 | 1.67 | 4.47 | 9.21 | 10.13 | 10.55 |
| 95th-Percentile Queue Length [ft/ln] | 416.55 | 531.14 | 464.09 | 41.87 | 111.67 | 230.27 | 253.15 | 263.74 |

**Movement, Approach, & Intersection Results**

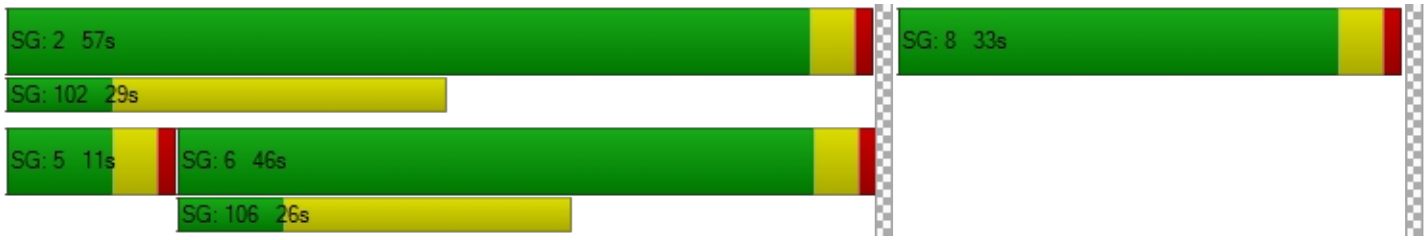
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 35.28 | 55.00 | 47.30 | 0.00 | 0.00 | 40.32 | 50.10 | 10.90 | 0.00 | 0.00 | 17.29 | 18.26 |
| Movement LOS | D | D | D | | | D | D | B | | | B | B |
| d_A, Approach Delay [s/veh] | 41.01 | | | 40.32 | | | 13.28 | | | 17.30 | | |
| Approach LOS | D | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 25.43 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.688 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.70 | 34.70 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.715 | 2.015 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 644 | 155 | 1177 | 933 |
| d_b, Bicycle Delay [s] | 20.69 | 38.30 | 7.62 | 12.82 |
| l_b,int, Bicycle LOS Score for Intersection | 5.072 | 1.560 | 2.468 | 2.288 |
| Bicycle LOS | F | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 33.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.846 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 171 | 241 | 94 | 190 | 382 | 185 | 238 | 2193 | 117 | 104 | 1817 | 112 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 171 | 241 | 94 | 190 | 382 | 185 | 238 | 2193 | 117 | 104 | 1817 | 112 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 43 | 60 | 24 | 48 | 96 | 46 | 60 | 548 | 29 | 26 | 454 | 28 |
| Total Analysis Volume [veh/h] | 171 | 241 | 94 | 190 | 382 | 185 | 238 | 2193 | 117 | 104 | 1817 | 112 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 110 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 10 | 41 | 0 | 11 | 42 | 0 | 21 | 47 | 0 | 11 | 37 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 29 | 0 | 0 | 26 | 0 | 0 | 25 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 24 | 24 | 7 | 25 | 25 | 16 | 56 | 56 | 7 | 47 | 47 |
| g / C, Green / Cycle | 0.05 | 0.22 | 0.22 | 0.06 | 0.23 | 0.23 | 0.15 | 0.51 | 0.51 | 0.06 | 0.43 | 0.43 |
| (v / s)_i Volume / Saturation Flow Rate | 0.05 | 0.09 | 0.08 | 0.05 | 0.20 | 0.10 | 0.13 | 0.40 | 0.42 | 0.06 | 0.25 | 0.27 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 194 | 411 | 411 | 225 | 428 | 428 | 268 | 1937 | 968 | 116 | 2424 | 808 |
| d1, Uniform Delay [s] | 51.65 | 37.23 | 36.96 | 50.96 | 41.36 | 36.61 | 45.95 | 22.06 | 22.64 | 51.14 | 24.25 | 24.75 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.15 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 12.26 | 0.69 | 0.61 | 8.29 | 8.97 | 0.69 | 9.65 | 3.28 | 7.52 | 20.35 | 1.05 | 3.61 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.88 | 0.42 | 0.39 | 0.84 | 0.89 | 0.43 | 0.89 | 0.79 | 0.82 | 0.90 | 0.59 | 0.62 |
| d, Delay for Lane Group [s/veh] | 63.91 | 37.92 | 37.57 | 59.25 | 50.33 | 37.30 | 55.61 | 25.34 | 30.16 | 71.49 | 25.31 | 28.36 |
| Lane Group LOS | E | D | D | E | D | D | E | C | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.67 | 4.11 | 3.78 | 2.84 | 11.01 | 4.35 | 7.07 | 16.19 | 18.33 | 3.49 | 9.53 | 10.86 |
| 50th-Percentile Queue Length [ft/ln] | 66.69 | 102.86 | 94.53 | 71.10 | 275.36 | 108.66 | 176.65 | 404.71 | 458.31 | 87.37 | 238.15 | 271.39 |
| 95th-Percentile Queue Length [veh/ln] | 4.80 | 7.41 | 6.81 | 5.12 | 16.46 | 7.77 | 11.43 | 22.79 | 25.35 | 6.29 | 14.59 | 16.26 |
| 95th-Percentile Queue Length [ft/ln] | 120.05 | 185.15 | 170.16 | 127.99 | 411.43 | 194.14 | 285.64 | 569.68 | 633.86 | 157.27 | 364.70 | 406.47 |

**Movement, Approach, & Intersection Results**

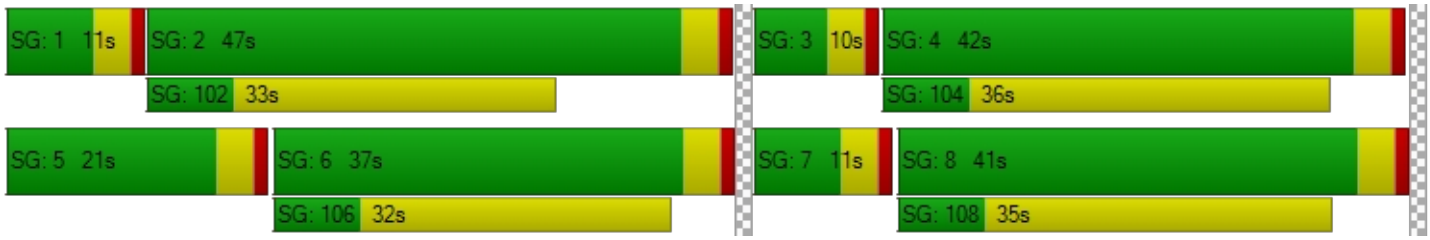
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 63.91 | 37.82 | 37.57 | 59.25 | 50.33 | 37.30 | 55.61 | 26.82 | 30.16 | 71.49 | 25.96 | 28.36 |
| Movement LOS | E | D | D | E | D | D | E | C | C | E | C | C |
| d_A, Approach Delay [s/veh] | 46.59 | | | 49.39 | | | 29.66 | | | 28.42 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 33.25 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.846 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 44.58 | 44.58 | 44.58 | 44.58 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.526 | 2.681 | 3.310 | 3.285 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 672 | 691 | 781 | 600 |
| d_b, Bicycle Delay [s] | 24.25 | 23.59 | 20.43 | 26.97 |
| l_b,int, Bicycle LOS Score for Intersection | 1.977 | 2.809 | 2.961 | 2.398 |
| Bicycle LOS | A | C | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 18.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.737 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 201 | 14 | 167 | 28 | 33 | 16 | 14 | 2169 | 487 | 201 | 1755 | 37 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 201 | 14 | 167 | 28 | 33 | 16 | 14 | 2169 | 487 | 201 | 1755 | 37 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 50 | 4 | 42 | 7 | 8 | 4 | 4 | 542 | 122 | 50 | 439 | 9 |
| Total Analysis Volume [veh/h] | 201 | 14 | 167 | 28 | 33 | 16 | 14 | 2169 | 487 | 201 | 1755 | 37 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 26 | 0 | 0 | 10 | 0 | 10 | 32 | 0 | 22 | 44 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 14 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 11 | 11 | 11 | 5 | 5 | 2 | 46 | 46 | 12 | 57 | 57 |
| g / C, Green / Cycle | 0.12 | 0.12 | 0.12 | 0.06 | 0.06 | 0.02 | 0.51 | 0.51 | 0.13 | 0.63 | 0.63 |
| (v / s)_i Volume / Saturation Flow Rate | 0.06 | 0.06 | 0.09 | 0.02 | 0.03 | 0.01 | 0.38 | 0.26 | 0.11 | 0.31 | 0.32 |
| s, saturation flow rate [veh/h] | 1750 | 1750 | 1900 | 1800 | 1900 | 1800 | 5700 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 205 | 205 | 222 | 105 | 110 | 38 | 2926 | 975 | 241 | 2380 | 1190 |
| d1, Uniform Delay [s] | 37.45 | 37.46 | 38.54 | 40.63 | 41.06 | 43.55 | 17.24 | 14.36 | 38.05 | 9.13 | 9.30 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 2.07 | 2.09 | 5.05 | 1.35 | 2.77 | 5.86 | 1.74 | 1.83 | 7.30 | 0.74 | 1.60 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.52 | 0.53 | 0.75 | 0.27 | 0.44 | 0.37 | 0.74 | 0.50 | 0.83 | 0.50 | 0.52 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 39.51 | 39.55 | 43.59 | 41.98 | 43.83 | 49.41 | 18.98 | 16.19 | 45.35 | 9.87 | 10.90 |
| Lane Group LOS | D | D | D | D | D | D | B | B | D | A | B |
| Critical Lane Group | No | No | Yes | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.31 | 2.33 | 3.83 | 0.63 | 1.13 | 0.37 | 11.28 | 6.56 | 4.74 | 5.74 | 6.35 |
| 50th-Percentile Queue Length [ft/ln] | 57.80 | 58.18 | 95.77 | 15.70 | 28.16 | 9.18 | 282.04 | 164.01 | 118.58 | 143.48 | 158.85 |
| 95th-Percentile Queue Length [veh/ln] | 4.16 | 4.19 | 6.90 | 1.13 | 2.03 | 0.66 | 16.79 | 10.76 | 8.31 | 9.67 | 10.49 |
| 95th-Percentile Queue Length [ft/ln] | 104.04 | 104.73 | 172.39 | 28.26 | 50.68 | 16.52 | 419.75 | 269.03 | 207.87 | 241.70 | 262.20 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 39.53 | 39.55 | 43.59 | 41.98 | 43.83 | 43.83 | 49.41 | 18.98 | 16.19 | 45.35 | 10.21 | 10.90 |
| Movement LOS | D | D | D | D | D | D | D | B | B | D | B | B |
| d_A, Approach Delay [s/veh] | 41.31 | | | 43.16 | | | 18.63 | | | 13.76 | | |
| Approach LOS | D | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 18.80 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.737 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.72 | 34.72 | 0.00 | 34.72 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.399 | 1.986 | 0.000 | 3.200 |
| Crosswalk LOS | B | A | F | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 488 | 133 | 622 | 888 |
| d_b, Bicycle Delay [s] | 25.73 | 39.24 | 21.40 | 13.92 |
| l_b,int, Bicycle LOS Score for Intersection | 2.190 | 1.687 | 3.028 | 2.656 |
| Bicycle LOS | B | A | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



Brea Mall Expansion, Brea

Vistro File: N:\...\4099 HCM Network.vistro
Report File: N:\...\PM 2045+P.pdf

Scenario 14 PM 2045+P
4/12/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | HCM 6th Edition | NB Left | 0.883 | 44.0 | D |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | HCM 6th Edition | WB Left | 0.670 | 19.4 | B |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | HCM 6th Edition | NB Left | 0.574 | 13.6 | B |
| 4 | Randolph Avenue at Birch Street | Signalized | HCM 6th Edition | NB Left | 0.542 | 22.6 | C |
| 5 | State College Boulevard at Birch Street | Signalized | HCM 6th Edition | NB Left | 0.877 | 38.1 | D |
| 6 | S Associated Road at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.761 | 28.9 | C |
| 7 | Randolph Avenue at Madison Way | Signalized | HCM 6th Edition | WB Left | 0.196 | 16.2 | B |
| 8 | Randolph Avenue at Brea Mall | Signalized | HCM 6th Edition | EB Left | 0.408 | 18.3 | B |
| 9 | Brea Mall South at State College Boulevard | Signalized | HCM 6th Edition | WB Left | 0.643 | 30.9 | C |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 1.045 | 70.0 | E |
| 11 | Puente Street at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.640 | 16.8 | B |
| 12 | Brea Boulevard at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.888 | 41.7 | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.763 | 26.8 | C |
| 14 | State College Boulevard at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 1.080 | 71.9 | E |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.813 | 18.1 | B |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | HCM 6th Edition | EB Left | 0.824 | 26.1 | C |
| 17 | Associated Road at Imperial Highway | Signalized | HCM 6th Edition | NB Left | 0.944 | 48.5 | D |
| 18 | Castlegate Lane/Placentia | Signalized | HCM 6th | EB Left | 0.847 | 28.2 | C |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | Edition | EB Left | 0.847 | 28.2 | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 44.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.883 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 368 | 687 | 349 | 637 | 459 | 17 | 44 | 1694 | 302 | 454 | 1361 | 801 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 368 | 687 | 349 | 637 | 459 | 17 | 44 | 1694 | 302 | 454 | 1361 | 801 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 92 | 172 | 87 | 159 | 115 | 4 | 11 | 424 | 76 | 114 | 340 | 200 |
| Total Analysis Volume [veh/h] | 368 | 687 | 349 | 637 | 459 | 17 | 44 | 1694 | 302 | 454 | 1361 | 801 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 17 | 30 | 0 | 31 | 44 | 0 | 10 | 39 | 0 | 20 | 49 | 49 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 28 | 0 | 0 | 22 | 22 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 13 | 25 | 25 | 25 | 27 | 39 | 39 | 5 | 36 | 36 | 16 | 47 | 78 |
| g / C, Green / Cycle | 0.11 | 0.21 | 0.21 | 0.21 | 0.22 | 0.32 | 0.32 | 0.04 | 0.30 | 0.30 | 0.13 | 0.39 | 0.65 |
| (v / s)_i Volume / Saturation Flow Rate | 0.11 | 0.19 | 0.19 | 0.17 | 0.18 | 0.13 | 0.12 | 0.01 | 0.26 | 0.26 | 0.13 | 0.24 | 0.42 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1900 | 3500 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 381 | 396 | 396 | 396 | 787 | 616 | 616 | 138 | 1709 | 570 | 468 | 2247 | 1240 |
| d1, Uniform Delay [s] | 53.28 | 46.48 | 46.34 | 45.16 | 44.08 | 31.35 | 31.29 | 56.11 | 39.94 | 39.87 | 51.76 | 28.95 | 12.54 |
| k, delay calibration | 0.11 | 0.28 | 0.27 | 0.21 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 14.78 | 18.21 | 16.51 | 7.01 | 2.04 | 0.40 | 0.39 | 1.32 | 6.71 | 16.77 | 13.46 | 1.22 | 2.61 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.97 | 0.91 | 0.90 | 0.80 | 0.81 | 0.39 | 0.38 | 0.32 | 0.88 | 0.87 | 0.97 | 0.61 | 0.65 |
| d, Delay for Lane Group [s/veh] | 68.06 | 64.70 | 62.86 | 52.17 | 46.12 | 31.75 | 31.69 | 57.43 | 46.65 | 56.64 | 65.23 | 30.17 | 15.15 |
| Lane Group LOS | E | E | E | D | D | C | C | E | D | E | E | C | B |
| Critical Lane Group | No | Yes | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 6.30 | 12.51 | 12.16 | 9.71 | 9.16 | 5.45 | 5.37 | 0.67 | 14.93 | 16.43 | 7.66 | 10.57 | 12.93 |
| 50th-Percentile Queue Length [ft/ln] | 157.5 | 312.8 | 304.0 | 242.8 | 229.04 | 136.21 | 134.29 | 16.87 | 373.25 | 410.63 | 191.46 | 264.14 | 323.28 |
| 95th-Percentile Queue Length [veh/ln] | 10.42 | 18.31 | 17.88 | 14.82 | 14.13 | 9.28 | 9.17 | 1.21 | 21.27 | 23.07 | 12.20 | 15.90 | 18.83 |
| 95th-Percentile Queue Length [ft/ln] | 260.4 | 457.8 | 447.0 | 370.6 | 353.14 | 231.91 | 229.31 | 30.37 | 531.67 | 576.80 | 304.92 | 397.41 | 470.71 |

**Movement, Approach, & Intersection Results**

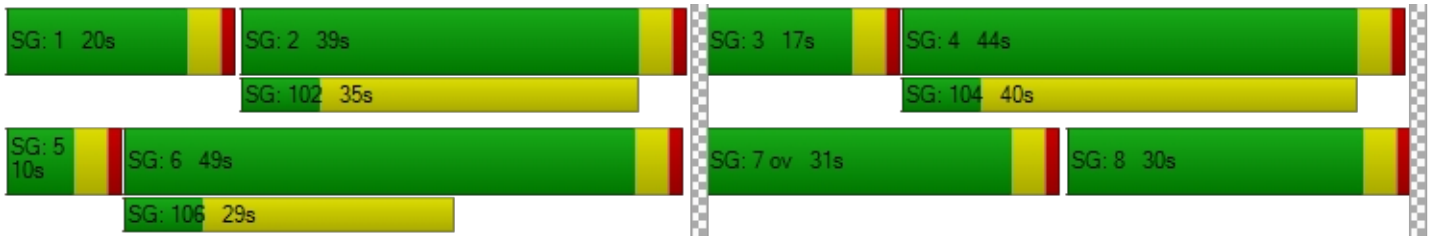
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 68.06 | 63.83 | 52.29 | 46.12 | 31.72 | 31.69 | 57.43 | 47.80 | 56.64 | 65.23 | 30.17 | 15.15 |
| Movement LOS | E | E | D | D | C | C | E | D | E | E | C | B |
| d_A, Approach Delay [s/veh] | 62.28 | | | 39.96 | | | 49.32 | | | 31.65 | | |
| Approach LOS | E | | | D | | | D | | | C | | |
| d_I, Intersection Delay [s/veh] | 43.96 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.883 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.972 | 2.896 | 3.273 | 0.000 |
| Crosswalk LOS | C | C | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 433 | 666 | 583 | 750 |
| d_b, Bicycle Delay [s] | 36.83 | 26.68 | 30.12 | 23.45 |
| l_b,int, Bicycle LOS Score for Intersection | 2.718 | 2.478 | 2.401 | 2.998 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 19.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.670 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 497 | 0 | 895 | 0 | 1512 | 877 | 280 | 1836 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 497 | 0 | 895 | 0 | 1512 | 877 | 280 | 1836 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 124 | 0 | 224 | 0 | 378 | 219 | 70 | 459 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 497 | 0 | 895 | 0 | 1512 | 877 | 280 | 1836 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 46 | 0 | 0 | 0 | 31 | 0 | 13 | 44 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 20 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | No | No | |
| Maximum Recall | | | | No | | | | No | | No | No | |
| Pedestrian Recall | | | | No | | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | R | C | R | L | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 27 | 27 | 42 | 42 | 9 | 55 |
| g / C, Green / Cycle | | 0.30 | 0.30 | 0.47 | 0.47 | 0.10 | 0.62 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.14 | 0.24 | 0.27 | 0.23 | 0.08 | 0.32 |
| s, saturation flow rate [veh/h] | | 3500 | 3800 | 5700 | 3800 | 3500 | 5700 |
| c, Capacity [veh/h] | | 1035 | 1124 | 2680 | 1787 | 353 | 3508 |
| d1, Uniform Delay [s] | | 26.03 | 29.21 | 17.20 | 16.43 | 39.57 | 9.82 |
| k, delay calibration | | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 0.35 | 1.33 | 0.87 | 0.97 | 4.06 | 0.56 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.48 | 0.80 | 0.56 | 0.49 | 0.79 | 0.52 |
| d, Delay for Lane Group [s/veh] | | 26.38 | 30.55 | 18.06 | 17.39 | 43.64 | 10.38 |
| Lane Group LOS | | C | C | B | B | D | B |
| Critical Lane Group | | No | Yes | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | | 4.32 | 8.83 | 7.31 | 6.14 | 3.18 | 6.26 |
| 50th-Percentile Queue Length [ft/ln] | | 107.91 | 220.79 | 182.87 | 153.51 | 79.59 | 156.44 |
| 95th-Percentile Queue Length [veh/ln] | | 7.72 | 13.71 | 11.75 | 10.20 | 5.73 | 10.36 |
| 95th-Percentile Queue Length [ft/ln] | | 193.09 | 342.64 | 293.76 | 255.11 | 143.26 | 259.00 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 26.38 | 0.00 | 30.55 | 0.00 | 18.06 | 17.39 | 43.64 | 10.38 | 0.00 |
| Movement LOS | | | | C | | C | | B | B | D | B | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 29.06 | | | 17.82 | | | 14.78 | | |
| Approach LOS | A | | | C | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 19.38 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.670 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.278 | 2.470 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 933 | 600 | 889 |
| d_b, Bicycle Delay [s] | 45.01 | 12.81 | 22.06 | 13.90 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 1.560 | 2.874 | 2.723 |
| Bicycle LOS | D | A | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 13.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.574 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | | | | No | | | No | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 710 | 0 | 330 | 0 | 0 | 0 | 0 | 1638 | 602 | 0 | 1203 | 571 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 710 | 0 | 330 | 0 | 0 | 0 | 0 | 1638 | 602 | 0 | 1203 | 571 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 178 | 0 | 83 | 0 | 0 | 0 | 0 | 410 | 151 | 0 | 301 | 0 |
| Total Analysis Volume [veh/h] | 710 | 0 | 330 | 0 | 0 | 0 | 0 | 1638 | 602 | 0 | 1203 | 0 |
| Presence of On-Street Parking | No | | No | | | | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 54 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 36 | 0 |
| Vehicle Extension [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | No | | | | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | | | | | | | No | | | No | |
| Maximum Recall | No | | | | | | | No | | | No | |
| Pedestrian Recall | No | | | | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | R | | C | C | R | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 22 | 22 | | 59 | 59 | 59 | 59 |
| g / C, Green / Cycle | 0.25 | 0.25 | | 0.66 | 0.66 | 0.66 | 0.66 |
| (v / s)_i Volume / Saturation Flow Rate | 0.20 | 0.17 | | 0.29 | 0.29 | 0.29 | 0.21 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | | 3800 | 1900 | 1900 | 5700 |
| c, Capacity [veh/h] | 873 | 474 | | 2514 | 1257 | 1257 | 3771 |
| d1, Uniform Delay [s] | 31.75 | 30.63 | | 7.29 | 7.29 | 7.29 | 6.52 |
| k, delay calibration | 0.11 | 0.11 | | 0.50 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.90 | 1.86 | | 0.57 | 1.15 | 1.15 | 0.22 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.81 | 0.70 | | 0.45 | 0.45 | 0.45 | 0.32 |
| d, Delay for Lane Group [s/veh] | 33.65 | 32.49 | | 7.87 | 8.44 | 8.44 | 6.74 |
| Lane Group LOS | C | C | | A | A | A | A |
| Critical Lane Group | Yes | No | | Yes | No | No | No |
| 50th-Percentile Queue Length [veh/ln] | 7.29 | 6.58 | | 4.63 | 4.83 | 4.83 | 2.91 |
| 50th-Percentile Queue Length [ft/ln] | 182.25 | 164.38 | | 115.74 | 120.73 | 120.73 | 72.83 |
| 95th-Percentile Queue Length [veh/ln] | 11.72 | 10.78 | | 8.16 | 8.43 | 8.43 | 5.24 |
| 95th-Percentile Queue Length [ft/ln] | 292.95 | 269.51 | | 203.96 | 210.83 | 210.83 | 131.10 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 33.65 | 0.00 | 32.49 | 0.00 | 0.00 | 0.00 | 0.00 | 7.92 | 8.44 | 0.00 | 6.74 | 0.00 |
| Movement LOS | C | | C | | | | | A | A | | A | |
| d_A, Approach Delay [s/veh] | 33.28 | | | 0.00 | | | 8.15 | | | 6.74 | | |
| Approach LOS | C | | | A | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 13.60 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.574 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 0.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.63 | 0.00 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.619 | 0.000 | 0.000 | 0.000 |
| Crosswalk LOS | B | F | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1112 | 0 | 712 | 712 |
| d_b, Bicycle Delay [s] | 8.86 | 44.96 | 18.65 | 18.65 |
| l_b,int, Bicycle LOS Score for Intersection | 1.560 | 4.132 | 2.792 | 2.221 |
| Bicycle LOS | A | D | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 22.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.542 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 148 | 76 | 187 | 55 | 54 | 112 | 93 | 770 | 117 | 208 | 1215 | 49 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 148 | 76 | 187 | 55 | 54 | 112 | 93 | 770 | 117 | 208 | 1215 | 49 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 37 | 19 | 47 | 14 | 14 | 28 | 23 | 193 | 29 | 52 | 304 | 12 |
| Total Analysis Volume [veh/h] | 148 | 76 | 187 | 55 | 54 | 112 | 93 | 770 | 117 | 208 | 1215 | 49 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 40 | 0 | 0 | 40 | 0 | 10 | 31 | 0 | 19 | 40 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 25 | 0 | 0 | 19 | 0 | 0 | 18 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 11 | 11 | 11 | 11 | 11 | 6 | 54 | 54 | 12 | 61 | 61 |
| g / C, Green / Cycle | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.07 | 0.60 | 0.60 | 0.14 | 0.67 | 0.67 |
| (v / s)_i Volume / Saturation Flow Rate | 0.08 | 0.04 | 0.10 | 0.03 | 0.09 | 0.05 | 0.24 | 0.23 | 0.12 | 0.32 | 0.03 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 131 | 244 | 244 | 214 | 244 | 122 | 1143 | 1143 | 246 | 2549 | 1275 |
| d1, Uniform Delay [s] | 36.92 | 35.67 | 37.98 | 35.32 | 37.52 | 41.28 | 9.39 | 9.26 | 37.94 | 7.17 | 5.01 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 78.51 | 0.72 | 5.04 | 0.63 | 3.34 | 9.39 | 1.03 | 0.96 | 7.69 | 0.64 | 0.06 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 1.13 | 0.31 | 0.77 | 0.26 | 0.68 | 0.76 | 0.40 | 0.38 | 0.84 | 0.48 | 0.04 |
| d, Delay for Lane Group [s/veh] | 115.43 | 36.39 | 43.02 | 35.95 | 40.86 | 50.67 | 10.42 | 10.21 | 45.62 | 7.82 | 5.07 |
| Lane Group LOS | F | D | D | D | D | D | B | B | D | A | A |
| Critical Lane Group | No | No | Yes | No | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 5.52 | 1.55 | 4.27 | 1.11 | 3.67 | 2.32 | 4.53 | 4.26 | 4.93 | 4.97 | 0.29 |
| 50th-Percentile Queue Length [ft/ln] | 138.08 | 38.70 | 106.72 | 27.79 | 91.76 | 58.11 | 113.31 | 106.52 | 123.21 | 124.31 | 7.18 |
| 95th-Percentile Queue Length [veh/ln] | 9.81 | 2.79 | 7.66 | 2.00 | 6.61 | 4.18 | 8.02 | 7.65 | 8.57 | 8.63 | 0.52 |
| 95th-Percentile Queue Length [ft/ln] | 245.37 | 69.66 | 191.43 | 50.02 | 165.17 | 104.59 | 200.60 | 191.15 | 214.22 | 215.73 | 12.93 |

**Movement, Approach, & Intersection Results**

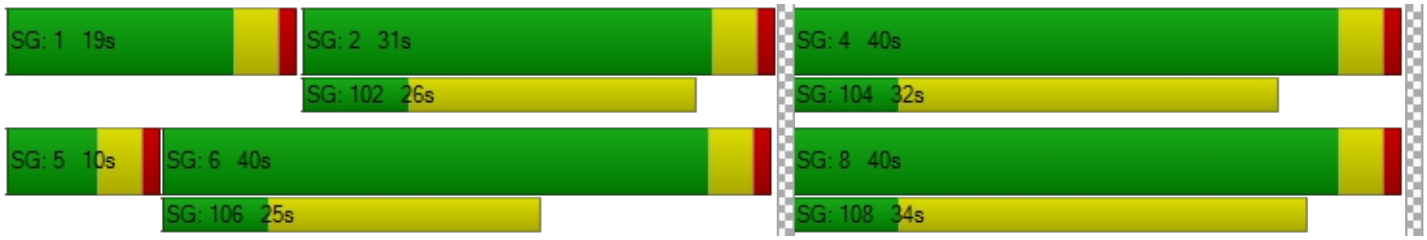
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 115.43 | 36.39 | 43.02 | 35.95 | 40.86 | 40.86 | 50.67 | 10.34 | 10.21 | 45.62 | 7.82 | 5.07 |
| Movement LOS | F | D | D | D | D | D | D | B | B | D | A | A |
| d_A, Approach Delay [s/veh] | 67.87 | | | 39.64 | | | 14.15 | | | 13.07 | | |
| Approach LOS | E | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 22.62 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.542 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.70 | 34.70 | 34.70 | 34.70 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.323 | 2.082 | 2.989 | 2.934 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 800 | 800 | 600 | 800 |
| d_b, Bicycle Delay [s] | 16.22 | 16.22 | 22.07 | 16.22 |
| l_b,int, Bicycle LOS Score for Intersection | 2.238 | 1.924 | 2.368 | 2.774 |
| Bicycle LOS | B | A | B | C |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 38.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.877 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 157 | 473 | 184 | 393 | 430 | 363 | 320 | 893 | 182 | 170 | 1140 | 749 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 157 | 473 | 184 | 393 | 430 | 363 | 320 | 893 | 182 | 170 | 1140 | 749 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 39 | 118 | 46 | 98 | 108 | 91 | 80 | 223 | 46 | 43 | 285 | 187 |
| Total Analysis Volume [veh/h] | 157 | 473 | 184 | 393 | 430 | 363 | 320 | 893 | 182 | 170 | 1140 | 749 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 115 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 10 | 39 | 0 | 23 | 52 | 0 | 16 | 41 | 0 | 12 | 37 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 20 | 20 | 15 | 29 | 29 | 12 | 56 | 56 | 8 | 52 | 52 |
| g / C, Green / Cycle | 0.05 | 0.17 | 0.17 | 0.13 | 0.25 | 0.25 | 0.10 | 0.49 | 0.49 | 0.07 | 0.45 | 0.45 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.12 | 0.10 | 0.11 | 0.22 | 0.19 | 0.09 | 0.24 | 0.10 | 0.05 | 0.30 | 0.39 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 3500 | 1900 | 1900 | 3500 | 3800 | 1900 | 3500 | 3800 | 1900 |
| c, Capacity [veh/h] | 185 | 659 | 329 | 463 | 480 | 480 | 367 | 1861 | 930 | 230 | 1712 | 856 |
| d1, Uniform Delay [s] | 54.03 | 44.92 | 43.54 | 48.81 | 41.46 | 39.82 | 50.74 | 19.59 | 16.57 | 52.79 | 24.82 | 28.67 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.12 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 10.14 | 1.49 | 1.48 | 4.44 | 6.58 | 2.54 | 6.47 | 0.89 | 0.47 | 4.60 | 2.07 | 12.11 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.85 | 0.72 | 0.56 | 0.85 | 0.89 | 0.76 | 0.87 | 0.48 | 0.20 | 0.74 | 0.67 | 0.87 |
| d, Delay for Lane Group [s/veh] | 64.17 | 46.40 | 45.03 | 53.25 | 48.05 | 42.36 | 57.22 | 20.48 | 17.04 | 57.39 | 26.88 | 40.78 |
| Lane Group LOS | E | D | D | D | D | D | E | C | B | E | C | D |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | 2.51 | 6.50 | 4.93 | 5.79 | 12.45 | 9.86 | 4.86 | 8.05 | 2.82 | 2.56 | 12.42 | 20.99 |
| 50th-Percentile Queue Length [ft/ln] | 62.80 | 162.39 | 123.31 | 144.68 | 311.17 | 246.55 | 121.52 | 201.19 | 70.44 | 63.94 | 310.48 | 524.75 |
| 95th-Percentile Queue Length [veh/ln] | 4.52 | 10.68 | 8.57 | 9.73 | 18.23 | 15.01 | 8.48 | 12.70 | 5.07 | 4.60 | 18.20 | 28.50 |
| 95th-Percentile Queue Length [ft/ln] | 113.05 | 266.89 | 214.37 | 243.31 | 455.82 | 375.31 | 211.91 | 317.50 | 126.79 | 115.09 | 454.97 | 712.59 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 64.17 | 46.40 | 45.03 | 53.25 | 48.01 | 42.36 | 57.22 | 20.48 | 17.04 | 57.39 | 26.88 | 40.78 |
| Movement LOS | E | D | D | D | D | D | E | C | B | E | C | D |
| d_A, Approach Delay [s/veh] | 49.52 | | | 48.02 | | | 28.46 | | | 34.46 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 38.12 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.877 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 47.05 | 47.05 | 47.05 | 47.05 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.828 | 2.908 | 3.031 | 3.097 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 608 | 834 | 643 | 574 |
| d_b, Bicycle Delay [s] | 27.84 | 19.53 | 26.47 | 29.25 |
| l_b,int, Bicycle LOS Score for Intersection | 2.231 | 2.538 | 2.710 | 3.258 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 28.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.761 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 559 | 37 | 403 | 11 | 23 | 11 | 17 | 1042 | 349 | 332 | 1472 | 19 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 559 | 37 | 403 | 11 | 23 | 11 | 17 | 1042 | 349 | 332 | 1472 | 19 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 140 | 9 | 101 | 3 | 6 | 3 | 4 | 261 | 87 | 83 | 368 | 5 |
| Total Analysis Volume [veh/h] | 559 | 37 | 403 | 11 | 23 | 11 | 17 | 1042 | 349 | 332 | 1472 | 19 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 6 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 30 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 28 | 65 | 65 | 0 | 37 | 0 | 10 | 38 | 0 | 17 | 45 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 7 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 26 | 0 | 26 | 0 | 0 | 27 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | No | | No | | No | No | | No | No | |
| Maximum Recall | No | No | No | | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | No | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 21 | 30 | 47 | 5 | 5 | 3 | 65 | 65 | 13 | 75 | 75 |
| g / C, Green / Cycle | 0.18 | 0.25 | 0.39 | 0.04 | 0.04 | 0.02 | 0.54 | 0.54 | 0.11 | 0.63 | 0.63 |
| (v / s)_i Volume / Saturation Flow Rate | 0.16 | 0.02 | 0.21 | 0.01 | 0.02 | 0.01 | 0.38 | 0.35 | 0.09 | 0.39 | 0.39 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 |
| c, Capacity [veh/h] | 624 | 477 | 747 | 77 | 75 | 40 | 1027 | 1027 | 380 | 1191 | 1191 |
| d1, Uniform Delay [s] | 48.21 | 34.34 | 28.07 | 55.73 | 56.40 | 57.94 | 20.41 | 19.59 | 52.69 | 13.75 | 13.74 |
| k, delay calibration | 0.11 | 0.11 | 0.34 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.83 | 0.07 | 1.90 | 0.84 | 4.29 | 7.10 | 4.00 | 3.24 | 6.36 | 2.49 | 2.49 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.90 | 0.08 | 0.54 | 0.14 | 0.46 | 0.43 | 0.70 | 0.65 | 0.87 | 0.63 | 0.63 |
| d, Delay for Lane Group [s/veh] | 53.04 | 34.41 | 29.98 | 56.57 | 60.69 | 65.04 | 24.41 | 22.83 | 59.05 | 16.25 | 16.23 |
| Lane Group LOS | D | C | C | E | E | E | C | C | E | B | B |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 8.57 | 0.84 | 9.28 | 0.34 | 1.10 | 0.59 | 15.55 | 13.81 | 5.26 | 12.54 | 12.51 |
| 50th-Percentile Queue Length [ft/ln] | 214.28 | 21.07 | 231.98 | 8.51 | 27.45 | 14.71 | 388.66 | 345.14 | 131.44 | 313.38 | 312.81 |
| 95th-Percentile Queue Length [veh/ln] | 13.37 | 1.52 | 14.27 | 0.61 | 1.98 | 1.06 | 22.01 | 19.90 | 9.02 | 18.34 | 18.31 |
| 95th-Percentile Queue Length [ft/ln] | 334.32 | 37.93 | 356.87 | 15.33 | 49.41 | 26.49 | 550.31 | 497.48 | 225.45 | 458.54 | 457.84 |

**Movement, Approach, & Intersection Results**

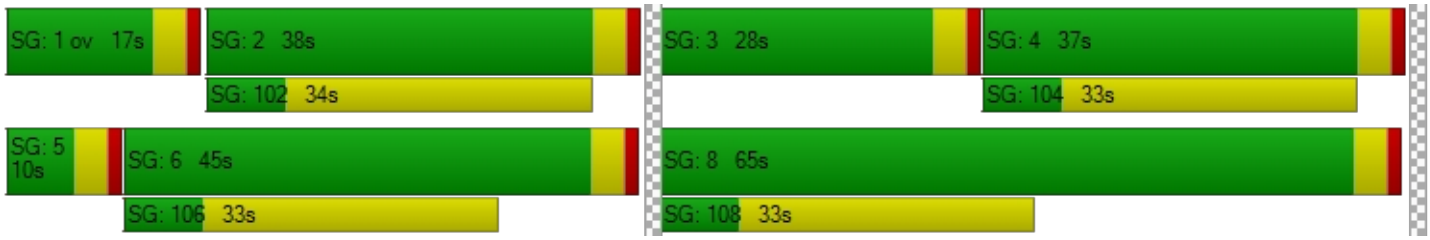
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 53.04 | 34.41 | 29.98 | 56.57 | 60.69 | 60.69 | 65.04 | 23.92 | 22.83 | 59.05 | 16.24 | 16.23 |
| Movement LOS | D | C | C | E | E | E | E | C | C | E | B | B |
| d_A, Approach Delay [s/veh] | 43.05 | | | 59.68 | | | 24.15 | | | 24.03 | | |
| Approach LOS | D | | | E | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 28.89 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.761 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.51 | 49.51 | 49.51 | 49.51 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.743 | 1.992 | 2.986 | 3.015 |
| Crosswalk LOS | B | A | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1017 | 550 | 567 | 683 |
| d_b, Bicycle Delay [s] | 14.51 | 31.54 | 30.82 | 26.01 |
| l_b,int, Bicycle LOS Score for Intersection | 3.208 | 1.634 | 2.721 | 3.064 |
| Bicycle LOS | C | A | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 16.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.196 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 48 | 368 | 45 | 29 | 290 | 32 | 68 | 4 | 55 | 79 | 4 | 38 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 48 | 368 | 45 | 29 | 290 | 32 | 68 | 4 | 55 | 79 | 4 | 38 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 12 | 92 | 11 | 7 | 73 | 8 | 17 | 1 | 14 | 20 | 1 | 10 |
| Total Analysis Volume [veh/h] | 48 | 368 | 45 | 29 | 290 | 32 | 68 | 4 | 55 | 79 | 4 | 38 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 23 | 50 | 0 | 10 | 37 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 12 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | L | C | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 4 | 69 | 69 | 3 | 68 | 68 | 6 | 6 | 6 | 6 |
| g / C, Green / Cycle | 0.05 | 0.77 | 0.77 | 0.04 | 0.76 | 0.76 | 0.06 | 0.06 | 0.06 | 0.06 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.11 | 0.11 | 0.02 | 0.09 | 0.08 | 0.04 | 0.03 | 0.04 | 0.02 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 86 | 1456 | 1456 | 64 | 1433 | 1433 | 126 | 123 | 110 | 123 |
| d1, Uniform Delay [s] | 41.94 | 2.77 | 2.76 | 42.56 | 2.98 | 2.97 | 40.91 | 40.63 | 41.17 | 40.26 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.56 | 0.21 | 0.20 | 4.91 | 0.16 | 0.16 | 3.57 | 2.85 | 8.36 | 1.62 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.56 | 0.14 | 0.14 | 0.45 | 0.11 | 0.11 | 0.54 | 0.48 | 0.72 | 0.34 |
|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 47.50 | 2.97 | 2.96 | 47.47 | 3.14 | 3.13 | 44.48 | 43.48 | 49.53 | 41.87 |
| Lane Group LOS | D | A | A | D | A | A | D | D | D | D |
| Critical Lane Group | No | Yes | No | Yes | No | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 1.17 | 0.77 | 0.75 | 0.71 | 0.64 | 0.63 | 1.57 | 1.35 | 1.95 | 0.94 |
| 50th-Percentile Queue Length [ft/ln] | 29.14 | 19.36 | 18.77 | 17.84 | 16.01 | 15.65 | 39.36 | 33.67 | 48.77 | 23.41 |
| 95th-Percentile Queue Length [veh/ln] | 2.10 | 1.39 | 1.35 | 1.28 | 1.15 | 1.13 | 2.83 | 2.42 | 3.51 | 1.69 |
| 95th-Percentile Queue Length [ft/ln] | 52.45 | 34.86 | 33.78 | 32.12 | 28.82 | 28.17 | 70.84 | 60.61 | 87.79 | 42.14 |

**Movement, Approach, & Intersection Results**

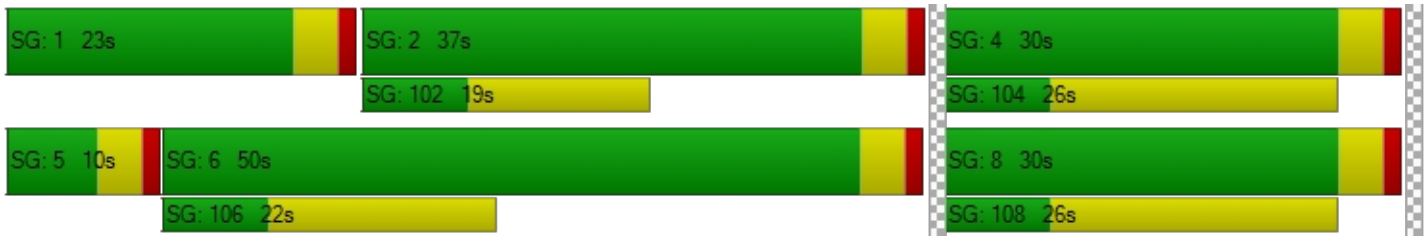
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 47.50 | 2.97 | 2.96 | 47.47 | 3.14 | 3.13 | 44.48 | 43.48 | 43.48 | 49.53 | 41.87 | 41.87 |
| Movement LOS | D | A | A | D | A | A | D | D | D | D | D | D |
| d_A, Approach Delay [s/veh] | 7.60 | | | 6.80 | | | 44.02 | | | 46.88 | | |
| Approach LOS | A | | | A | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 16.18 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.196 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.584 | 2.557 | 2.008 | 2.004 |
| Crosswalk LOS | B | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1022 | 733 | 578 | 578 |
| d_b, Bicycle Delay [s] | 10.76 | 18.06 | 22.77 | 22.77 |
| l_b,int, Bicycle LOS Score for Intersection | 1.940 | 1.849 | 1.769 | 1.759 |
| Bicycle LOS | A | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 18.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.408 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 17 | 367 | 430 | 56 | 392 | 21 | 18 | 3 | 12 | 328 | 3 | 57 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 17 | 367 | 430 | 56 | 392 | 21 | 18 | 3 | 12 | 328 | 3 | 57 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 4 | 92 | 108 | 14 | 98 | 5 | 5 | 1 | 3 | 82 | 1 | 14 |
| Total Analysis Volume [veh/h] | 17 | 367 | 430 | 56 | 392 | 21 | 18 | 3 | 12 | 328 | 3 | 57 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 29 | 0 | 10 | 29 | 0 | 0 | 30 | 0 | 0 | 31 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 17 | 0 | 0 | 18 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | C | R | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 0.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 71 | 62 | 62 | 71 | 65 | 65 | 4 | 4 | 13 | 13 |
| g / C, Green / Cycle | 0.71 | 0.62 | 0.62 | 0.71 | 0.65 | 0.65 | 0.04 | 0.04 | 0.13 | 0.13 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.19 | 0.23 | 0.03 | 0.11 | 0.11 | 0.01 | 0.01 | 0.11 | 0.10 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 1295 | 1179 | 1179 | 1171 | 1226 | 1226 | 66 | 70 | 243 | 257 |
| d1, Uniform Delay [s] | 4.30 | 8.93 | 9.31 | 4.39 | 7.07 | 7.06 | 46.99 | 46.73 | 42.04 | 41.61 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.00 | 0.69 | 0.87 | 0.08 | 0.30 | 0.29 | 2.73 | 1.16 | 6.39 | 4.23 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.01 | 0.31 | 0.36 | 0.05 | 0.17 | 0.17 | 0.32 | 0.17 | 0.81 | 0.74 |
|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 4.30 | 9.62 | 10.19 | 4.47 | 7.37 | 7.36 | 49.72 | 47.89 | 48.42 | 45.84 |
| Lane Group LOS | A | A | B | A | A | A | D | D | D | D |
| Critical Lane Group | No | No | Yes | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.09 | 3.70 | 4.53 | 0.33 | 1.72 | 1.70 | 0.56 | 0.31 | 5.12 | 4.79 |
| 50th-Percentile Queue Length [ft/ln] | 2.27 | 92.52 | 113.32 | 8.15 | 43.12 | 42.49 | 13.94 | 7.77 | 127.93 | 119.70 |
| 95th-Percentile Queue Length [veh/ln] | 0.16 | 6.66 | 8.02 | 0.59 | 3.10 | 3.06 | 1.00 | 0.56 | 8.83 | 8.38 |
| 95th-Percentile Queue Length [ft/ln] | 4.09 | 166.54 | 200.61 | 14.67 | 77.62 | 76.48 | 25.10 | 13.99 | 220.68 | 209.41 |

**Movement, Approach, & Intersection Results**

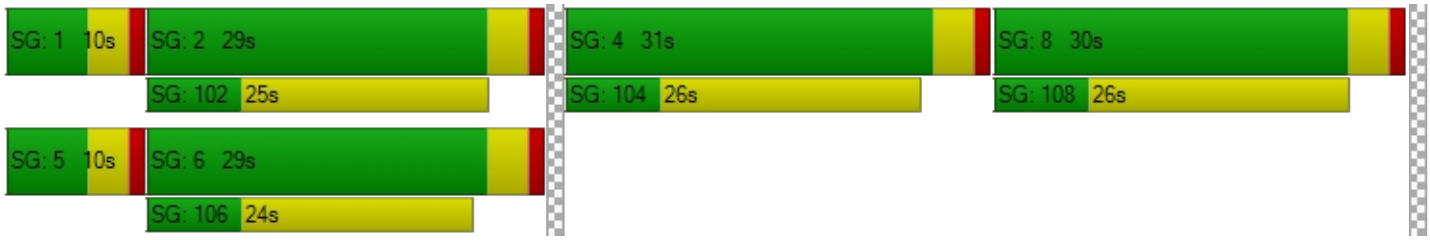
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 4.30 | 9.62 | 10.19 | 4.47 | 7.36 | 7.36 | 49.72 | 49.72 | 47.89 | 47.39 | 45.84 | 45.84 |
| Movement LOS | A | A | B | A | A | A | D | D | D | D | D | D |
| d_A, Approach Delay [s/veh] | 9.81 | | | 7.02 | | | 49.06 | | | 47.15 | | |
| Approach LOS | A | | | A | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 18.30 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.408 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 39.62 | 39.62 | 39.62 | 39.62 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.606 | 2.482 | 1.985 | 2.281 |
| Crosswalk LOS | B | B | A | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 500 | 500 | 520 | 540 |
| d_b, Bicycle Delay [s] | 28.14 | 28.14 | 27.40 | 26.66 |
| l_b,int, Bicycle LOS Score for Intersection | 2.231 | 1.947 | 1.614 | 2.200 |
| Bicycle LOS | B | A | A | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 30.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.643 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 151 | 26 | 67 | 56 | 20 | 428 | 620 | 595 | 23 | 104 | 490 | 49 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 151 | 26 | 67 | 56 | 20 | 428 | 620 | 595 | 23 | 104 | 490 | 49 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 38 | 7 | 17 | 14 | 5 | 107 | 155 | 149 | 6 | 26 | 123 | 12 |
| Total Analysis Volume [veh/h] | 151 | 26 | 67 | 56 | 20 | 428 | 620 | 595 | 23 | 104 | 490 | 49 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 6 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 30 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 37 | 0 | 0 | 10 | 10 | 41 | 31 | 0 | 42 | 32 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 21 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | No | No | No | | No | No | |
| Maximum Recall | | No | | | No | No | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | No | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | C | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 10 | 10 | 10 | 6 | 6 | 49 | 26 | 79 | 79 | 9 | 63 | 63 |
| g / C, Green / Cycle | 0.08 | 0.08 | 0.08 | 0.05 | 0.05 | 0.41 | 0.21 | 0.66 | 0.66 | 0.07 | 0.52 | 0.52 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.06 | 0.04 | 0.03 | 0.01 | 0.23 | 0.18 | 0.16 | 0.16 | 0.06 | 0.14 | 0.14 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 1900 | 1900 |
| c, Capacity [veh/h] | 182 | 200 | 155 | 93 | 98 | 783 | 743 | 1254 | 1254 | 133 | 991 | 991 |
| d1, Uniform Delay [s] | 52.55 | 54.08 | 52.54 | 55.77 | 54.61 | 26.81 | 45.28 | 8.31 | 8.29 | 54.65 | 16.06 | 15.99 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.38 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.16 | 2.52 | 1.91 | 6.18 | 1.02 | 2.08 | 2.54 | 0.47 | 0.47 | 9.44 | 0.69 | 0.66 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.35 | 0.57 | 0.43 | 0.60 | 0.20 | 0.55 | 0.83 | 0.25 | 0.24 | 0.78 | 0.28 | 0.27 |
| d, Delay for Lane Group [s/veh] | 53.71 | 56.60 | 54.45 | 61.95 | 55.63 | 28.90 | 47.82 | 8.78 | 8.76 | 64.09 | 16.75 | 16.65 |
| Lane Group LOS | D | E | D | E | E | C | D | A | A | E | B | B |
| Critical Lane Group | No | Yes | No | No | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 1.89 | 3.49 | 2.01 | 1.82 | 0.61 | 9.70 | 9.07 | 3.30 | 3.25 | 3.44 | 4.36 | 4.22 |
| 50th-Percentile Queue Length [ft/ln] | 47.37 | 87.25 | 50.22 | 45.56 | 15.23 | 242.53 | 226.73 | 82.41 | 81.21 | 86.05 | 109.02 | 105.44 |
| 95th-Percentile Queue Length [veh/ln] | 3.41 | 6.28 | 3.62 | 3.28 | 1.10 | 14.81 | 14.01 | 5.93 | 5.85 | 6.20 | 7.79 | 7.59 |
| 95th-Percentile Queue Length [ft/ln] | 85.27 | 157.05 | 90.40 | 82.00 | 27.42 | 370.23 | 350.20 | 148.33 | 146.18 | 154.88 | 194.64 | 189.65 |

**Movement, Approach, & Intersection Results**

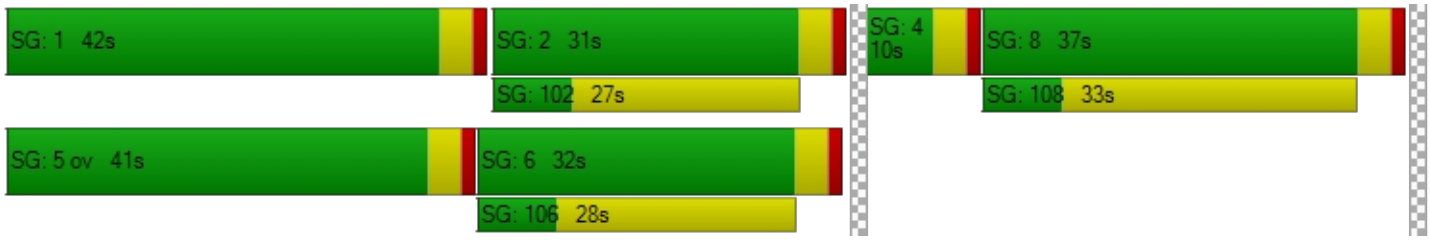
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 55.32 | 56.60 | 54.45 | 61.95 | 55.63 | 28.90 | 47.82 | 8.77 | 8.76 | 64.09 | 16.71 | 16.65 |
| Movement LOS | E | E | D | E | E | C | D | A | A | E | B | B |
| d_A, Approach Delay [s/veh] | 55.25 | | | 33.63 | | | 28.33 | | | 24.37 | | |
| Approach LOS | E | | | C | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 30.87 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.643 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 0.00 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.390 | 2.547 | 0.000 | 2.579 |
| Crosswalk LOS | B | B | F | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 550 | 100 | 450 | 466 |
| d_b, Bicycle Delay [s] | 31.57 | 54.18 | 36.07 | 35.30 |
| l_b,int, Bicycle LOS Score for Intersection | 1.962 | 1.975 | 2.581 | 2.090 |
| Bicycle LOS | A | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 70.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | E |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.045 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 786 | 1305 | 282 | 294 | 1020 | 439 | 336 | 1381 | 417 | 455 | 1699 | 301 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 786 | 1305 | 282 | 294 | 1020 | 439 | 336 | 1381 | 417 | 455 | 1699 | 301 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 197 | 326 | 71 | 74 | 255 | 110 | 84 | 345 | 104 | 114 | 425 | 75 |
| Total Analysis Volume [veh/h] | 786 | 1305 | 282 | 294 | 1020 | 439 | 336 | 1381 | 417 | 455 | 1699 | 301 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 24 | 47 | 0 | 16 | 39 | 0 | 16 | 42 | 0 | 15 | 41 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 31 | 0 | 0 | 28 | 0 | 0 | 31 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 20 | 40 | 40 | 12 | 31 | 31 | 12 | 41 | 41 | 11 | 40 | 40 |
| g / C, Green / Cycle | 0.17 | 0.33 | 0.33 | 0.10 | 0.26 | 0.26 | 0.10 | 0.35 | 0.35 | 0.09 | 0.34 | 0.34 |
| (v / s)_i Volume / Saturation Flow Rate | 0.22 | 0.23 | 0.15 | 0.08 | 0.18 | 0.23 | 0.10 | 0.32 | 0.31 | 0.13 | 0.30 | 0.16 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 585 | 1874 | 625 | 351 | 1494 | 498 | 354 | 1310 | 655 | 325 | 1918 | 639 |
| d1, Uniform Delay [s] | 50.02 | 35.09 | 31.77 | 53.07 | 39.84 | 42.54 | 53.69 | 37.93 | 37.14 | 54.49 | 37.66 | 31.41 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.31 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 157.17 | 0.47 | 0.51 | 5.31 | 0.56 | 13.24 | 13.16 | 12.78 | 16.34 | 184.43 | 6.46 | 2.48 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 1.34 | 0.70 | 0.45 | 0.84 | 0.68 | 0.88 | 0.95 | 0.93 | 0.89 | 1.40 | 0.89 | 0.47 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 207.19 | 35.56 | 32.28 | 58.38 | 40.40 | 55.78 | 66.85 | 50.71 | 53.48 | 238.92 | 44.12 | 33.89 |
| Lane Group LOS | F | D | C | E | D | E | E | D | D | F | D | C |
| Critical Lane Group | Yes | No | No | No | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 21.52 | 11.07 | 6.54 | 4.61 | 9.07 | 14.23 | 5.69 | 19.29 | 18.84 | 13.22 | 16.66 | 7.32 |
| 50th-Percentile Queue Length [ft/ln] | 537.88 | 276.81 | 163.49 | 115.34 | 226.76 | 355.74 | 142.13 | 482.20 | 471.06 | 330.60 | 416.52 | 182.94 |
| 95th-Percentile Queue Length [veh/ln] | 33.12 | 16.53 | 10.73 | 8.14 | 14.01 | 20.42 | 9.60 | 26.49 | 25.96 | 21.43 | 23.36 | 11.75 |
| 95th-Percentile Queue Length [ft/ln] | 828.09 | 413.24 | 268.34 | 203.41 | 350.24 | 510.41 | 239.89 | 662.27 | 649.03 | 535.79 | 583.88 | 293.84 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 207.19 | 35.56 | 32.28 | 58.38 | 40.40 | 55.78 | 66.85 | 51.04 | 53.48 | 238.92 | 44.12 | 33.89 |
| Movement LOS | F | D | C | E | D | E | E | D | D | F | D | C |
| d_A, Approach Delay [s/veh] | 92.02 | | | 47.26 | | | 54.01 | | | 78.97 | | |
| Approach LOS | F | | | D | | | D | | | E | | |
| d_I, Intersection Delay [s/veh] | 70.03 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |
| Intersection V/C | 1.045 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.325 | 3.263 | 3.356 | 3.341 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 716 | 583 | 633 | 616 |
| d_b, Bicycle Delay [s] | 24.73 | 30.13 | 28.04 | 28.73 |
| l_b,int, Bicycle LOS Score for Intersection | 2.865 | 2.524 | 2.733 | 2.910 |
| Bicycle LOS | C | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 16.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.640 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 38 | 51 | 93 | 243 | 113 | 228 | 146 | 1729 | 40 | 114 | 1930 | 401 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 38 | 51 | 93 | 243 | 113 | 228 | 146 | 1729 | 40 | 114 | 1930 | 401 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 10 | 13 | 23 | 61 | 28 | 57 | 37 | 432 | 10 | 29 | 483 | 100 |
| Total Analysis Volume [veh/h] | 38 | 51 | 93 | 243 | 113 | 228 | 146 | 1729 | 40 | 114 | 1930 | 401 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 38 | 0 | 0 | 38 | 0 | 18 | 41 | 0 | 11 | 34 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 23 | 0 | 0 | 17 | 0 | 0 | 23 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 15 | 15 | 15 | 15 | 15 | 15 | 9 | 56 | 56 | 7 | 54 | 54 |
| g / C, Green / Cycle | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.10 | 0.62 | 0.62 | 0.08 | 0.60 | 0.60 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.03 | 0.05 | 0.14 | 0.03 | 0.12 | 0.08 | 0.31 | 0.32 | 0.06 | 0.34 | 0.21 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 300 | 316 | 316 | 305 | 632 | 316 | 183 | 2359 | 1180 | 143 | 3413 | 1138 |
| d1, Uniform Delay [s] | 31.98 | 32.17 | 32.92 | 36.19 | 32.27 | 35.58 | 39.56 | 9.34 | 9.50 | 40.73 | 10.96 | 9.19 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.19 | 0.24 | 0.51 | 4.76 | 0.13 | 3.11 | 7.71 | 0.74 | 1.60 | 9.53 | 0.68 | 0.86 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.13 | 0.16 | 0.29 | 0.80 | 0.18 | 0.72 | 0.80 | 0.49 | 0.51 | 0.79 | 0.57 | 0.35 |
| d, Delay for Lane Group [s/veh] | 32.17 | 32.41 | 33.43 | 40.96 | 32.40 | 38.69 | 47.27 | 10.08 | 11.10 | 50.26 | 11.65 | 10.05 |
| Lane Group LOS | C | C | C | D | C | D | D | B | B | D | B | B |
| Critical Lane Group | No | No | No | Yes | No | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.71 | 0.96 | 1.80 | 5.45 | 1.06 | 4.93 | 3.51 | 5.75 | 6.35 | 2.83 | 7.15 | 3.89 |
| 50th-Percentile Queue Length [ft/ln] | 17.84 | 24.08 | 45.08 | 136.35 | 26.47 | 123.29 | 87.67 | 143.82 | 158.80 | 70.83 | 178.64 | 97.31 |
| 95th-Percentile Queue Length [veh/ln] | 1.28 | 1.73 | 3.25 | 9.28 | 1.91 | 8.57 | 6.31 | 9.69 | 10.49 | 5.10 | 11.53 | 7.01 |
| 95th-Percentile Queue Length [ft/ln] | 32.11 | 43.34 | 81.14 | 232.10 | 47.64 | 214.33 | 157.81 | 242.17 | 262.14 | 127.49 | 288.24 | 175.16 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 32.17 | 32.41 | 33.43 | 40.96 | 32.40 | 38.69 | 47.27 | 10.41 | 11.10 | 50.26 | 11.65 | 10.05 |
| Movement LOS | C | C | C | D | C | D | D | B | B | D | B | B |
| d_A, Approach Delay [s/veh] | 32.88 | | | 38.42 | | | 13.24 | | | 13.19 | | |
| Approach LOS | C | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 16.78 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.640 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.70 | 34.70 | 34.70 | 34.70 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.387 | 2.530 | 3.220 | 3.620 |
| Crosswalk LOS | B | B | C | D |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 755 | 755 | 822 | 666 |
| d_b, Bicycle Delay [s] | 17.44 | 17.44 | 15.63 | 20.02 |
| l_b,int, Bicycle LOS Score for Intersection | 1.860 | 2.041 | 2.613 | 2.904 |
| Bicycle LOS | A | B | B | C |

## Sequence

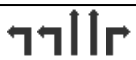
| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 41.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.888 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 553 | 989 | 319 | 277 | 712 | 234 | 263 | 1965 | 455 | 277 | 1884 | 207 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 553 | 989 | 319 | 277 | 712 | 234 | 263 | 1965 | 455 | 277 | 1884 | 207 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 138 | 247 | 80 | 69 | 178 | 59 | 66 | 491 | 114 | 69 | 471 | 52 |
| Total Analysis Volume [veh/h] | 553 | 989 | 319 | 277 | 712 | 234 | 263 | 1965 | 455 | 277 | 1884 | 207 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 23 | 47 | 0 | 15 | 39 | 0 | 14 | 44 | 0 | 14 | 44 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 19 | 34 | 34 | 11 | 26 | 26 | 10 | 49 | 49 | 10 | 49 | 49 |
| g / C, Green / Cycle | 0.16 | 0.28 | 0.28 | 0.09 | 0.22 | 0.22 | 0.08 | 0.41 | 0.41 | 0.08 | 0.41 | 0.41 |
| (v / s)_i Volume / Saturation Flow Rate | 0.16 | 0.17 | 0.17 | 0.08 | 0.19 | 0.12 | 0.08 | 0.34 | 0.24 | 0.08 | 0.33 | 0.11 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 556 | 1606 | 535 | 325 | 820 | 410 | 296 | 2324 | 775 | 296 | 2324 | 775 |
| d1, Uniform Delay [s] | 50.47 | 37.49 | 37.23 | 53.68 | 45.46 | 42.13 | 54.43 | 32.16 | 27.71 | 54.66 | 31.48 | 23.65 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 16.48 | 0.39 | 1.06 | 6.33 | 2.99 | 1.25 | 8.91 | 4.01 | 3.25 | 13.19 | 3.20 | 0.85 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.99 | 0.62 | 0.60 | 0.85 | 0.87 | 0.57 | 0.89 | 0.85 | 0.59 | 0.94 | 0.81 | 0.27 |
| d, Delay for Lane Group [s/veh] | 66.95 | 37.87 | 38.30 | 60.01 | 48.45 | 43.39 | 63.34 | 36.17 | 30.96 | 67.86 | 34.68 | 24.50 |
| Lane Group LOS | E | D | D | E | D | D | E | D | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 9.54 | 8.46 | 8.23 | 4.41 | 10.54 | 6.35 | 4.30 | 17.69 | 10.77 | 4.70 | 16.48 | 4.09 |
| 50th-Percentile Queue Length [ft/ln] | 238.52 | 211.49 | 205.84 | 110.13 | 263.44 | 158.87 | 107.50 | 442.36 | 269.33 | 117.59 | 412.08 | 102.34 |
| 95th-Percentile Queue Length [veh/ln] | 14.61 | 13.23 | 12.94 | 7.85 | 15.86 | 10.49 | 7.70 | 24.59 | 16.16 | 8.26 | 23.14 | 7.37 |
| 95th-Percentile Queue Length [ft/ln] | 365.16 | 330.74 | 323.49 | 196.18 | 396.54 | 262.23 | 192.52 | 614.82 | 403.90 | 206.51 | 578.53 | 184.21 |

**Movement, Approach, & Intersection Results**

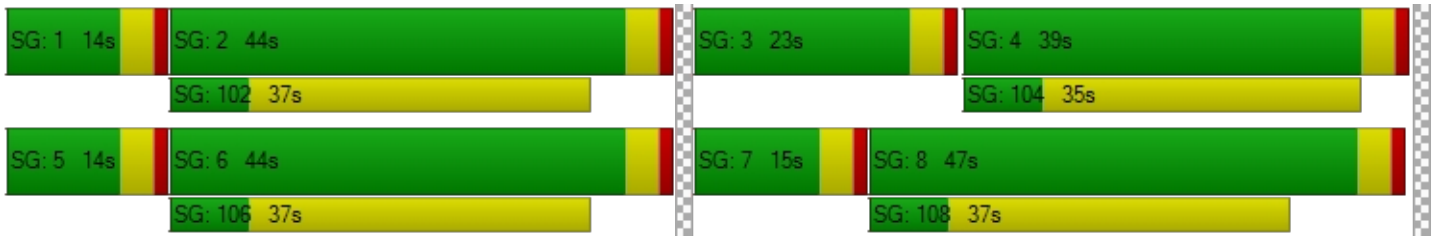
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 66.95 | 37.87 | 38.30 | 60.01 | 48.45 | 43.39 | 63.34 | 36.17 | 30.96 | 67.86 | 34.68 | 24.50 |
| Movement LOS | E | D | D | E | D | D | E | D | C | E | C | C |
| d_A, Approach Delay [s/veh] | 46.59 | | | 50.10 | | | 37.95 | | | 37.67 | | |
| Approach LOS | D | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 41.67 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.888 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.142 | 3.066 | 3.443 | 3.397 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 716 | 583 | 666 | 666 |
| d_b, Bicycle Delay [s] | 24.73 | 30.13 | 26.69 | 26.69 |
| l_b,int, Bicycle LOS Score for Intersection | 2.583 | 2.569 | 3.035 | 2.862 |
| Bicycle LOS | B | B | C | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 26.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.763 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 61 | 41 | 72 | 369 | 32 | 250 | 333 | 1903 | 47 | 77 | 2114 | 385 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 61 | 41 | 72 | 369 | 32 | 250 | 333 | 1903 | 47 | 77 | 2114 | 385 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 15 | 10 | 18 | 92 | 8 | 63 | 83 | 476 | 12 | 19 | 529 | 96 |
| Total Analysis Volume [veh/h] | 61 | 41 | 72 | 369 | 32 | 250 | 333 | 1903 | 47 | 77 | 2114 | 385 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 110 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 10 | 0 | 0 | 41 | 0 | 19 | 49 | 0 | 10 | 40 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 28 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 6 | 6 | 20 | 20 | 13 | 62 | 62 | 6 | 55 | 55 |
| g / C, Green / Cycle | 0.06 | 0.06 | 0.06 | 0.18 | 0.18 | 0.11 | 0.56 | 0.56 | 0.05 | 0.50 | 0.50 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.03 | 0.04 | 0.11 | 0.15 | 0.10 | 0.34 | 0.35 | 0.04 | 0.37 | 0.20 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 3500 | 1900 | 3500 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 106 | 106 | 112 | 625 | 339 | 401 | 2135 | 1068 | 100 | 2865 | 955 |
| d1, Uniform Delay [s] | 50.17 | 50.19 | 50.68 | 41.52 | 43.62 | 47.69 | 15.95 | 16.29 | 51.32 | 21.65 | 17.08 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 3.32 | 3.40 | 6.05 | 0.89 | 5.28 | 4.48 | 1.26 | 2.77 | 11.90 | 1.74 | 1.27 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.48 | 0.48 | 0.64 | 0.59 | 0.83 | 0.83 | 0.60 | 0.63 | 0.77 | 0.74 | 0.40 |
| d, Delay for Lane Group [s/veh] | 53.49 | 53.59 | 56.73 | 42.42 | 48.90 | 52.17 | 17.21 | 19.06 | 63.22 | 23.39 | 18.35 |
| Lane Group LOS | D | D | E | D | D | D | B | B | E | C | B |
| Critical Lane Group | No | No | Yes | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 1.45 | 1.47 | 2.13 | 4.66 | 7.86 | 4.70 | 10.51 | 11.61 | 2.42 | 14.23 | 6.27 |
| 50th-Percentile Queue Length [ft/ln] | 36.20 | 36.71 | 53.15 | 116.58 | 196.51 | 117.52 | 262.80 | 290.27 | 60.53 | 355.76 | 156.78 |
| 95th-Percentile Queue Length [veh/ln] | 2.61 | 2.64 | 3.83 | 8.20 | 12.46 | 8.26 | 15.83 | 17.20 | 4.36 | 20.42 | 10.38 |
| 95th-Percentile Queue Length [ft/ln] | 65.15 | 66.07 | 95.67 | 205.12 | 311.46 | 206.41 | 395.73 | 429.97 | 108.96 | 510.43 | 259.45 |

**Movement, Approach, & Intersection Results**

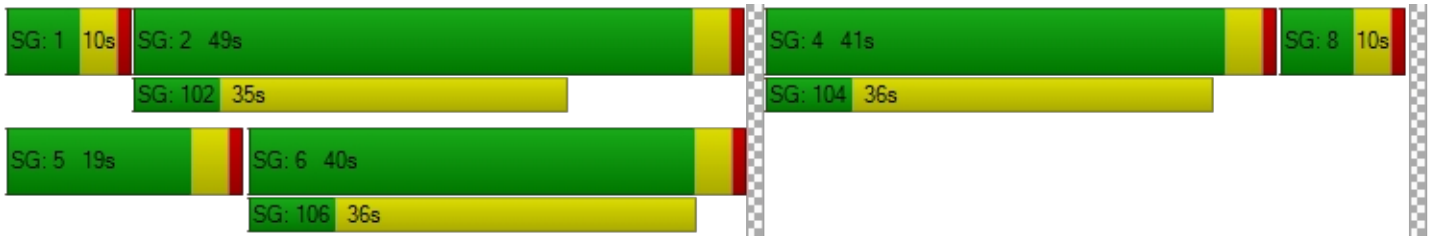
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 53.50 | 53.59 | 56.73 | 42.42 | 48.90 | 48.90 | 52.17 | 17.81 | 19.06 | 63.22 | 23.39 | 18.35 |
| Movement LOS | D | D | E | D | D | D | D | B | B | E | C | B |
| d_A, Approach Delay [s/veh] | 54.86 | | | 45.22 | | | 22.85 | | | 23.83 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 26.83 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.763 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 44.58 | 44.58 | 44.58 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.221 | 2.584 | 3.309 | 0.000 |
| Crosswalk LOS | B | B | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 109 | 672 | 818 | 654 |
| d_b, Bicycle Delay [s] | 49.19 | 24.25 | 19.23 | 24.91 |
| l_b,int, Bicycle LOS Score for Intersection | 1.703 | 2.634 | 2.815 | 2.976 |
| Bicycle LOS | A | B | C | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 71.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | E |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.080 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 391 | 655 | 471 | 481 | 339 | 103 | 118 | 2096 | 122 | 497 | 2061 | 591 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 391 | 655 | 471 | 481 | 339 | 103 | 118 | 2096 | 122 | 497 | 2061 | 591 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 98 | 164 | 118 | 120 | 85 | 26 | 30 | 524 | 31 | 124 | 515 | 148 |
| Total Analysis Volume [veh/h] | 391 | 655 | 471 | 481 | 339 | 103 | 118 | 2096 | 122 | 497 | 2061 | 591 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 29 | 41 | 0 | 27 | 39 | 0 | 10 | 34 | 0 | 18 | 42 | 42 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 23 | 0 | 0 | 23 | 23 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 16 | 33 | 33 | 23 | 40 | 40 | 6 | 34 | 34 | 14 | 42 | 69 |
| g / C, Green / Cycle | 0.13 | 0.27 | 0.27 | 0.19 | 0.33 | 0.33 | 0.05 | 0.28 | 0.28 | 0.12 | 0.35 | 0.58 |
| (v / s)_i Volume / Saturation Flow Rate | 0.11 | 0.17 | 0.25 | 0.24 | 0.12 | 0.11 | 0.03 | 0.29 | 0.31 | 0.14 | 0.36 | 0.31 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 2000 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 468 | 1037 | 519 | 384 | 629 | 629 | 177 | 1621 | 540 | 412 | 2003 | 1096 |
| d1, Uniform Delay [s] | 50.75 | 38.36 | 42.21 | 48.54 | 30.56 | 30.24 | 56.03 | 42.98 | 42.98 | 53.00 | 38.96 | 15.63 |
| k, delay calibration | 0.11 | 0.11 | 0.32 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.02 | 0.64 | 15.74 | 118.71 | 0.36 | 0.31 | 4.28 | 24.91 | 60.23 | 98.64 | 27.95 | 1.91 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.84 | 0.63 | 0.91 | 1.25 | 0.37 | 0.34 | 0.67 | 1.01 | 1.07 | 1.21 | 1.03 | 0.54 |
| d, Delay for Lane Group [s/veh] | 54.77 | 39.00 | 57.95 | 167.25 | 30.92 | 30.55 | 60.31 | 67.89 | 103.22 | 151.64 | 66.91 | 17.54 |
| Lane Group LOS | D | D | E | F | C | C | E | F | F | F | F | B |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 5.99 | 8.55 | 15.65 | 12.05 | 5.14 | 4.69 | 1.86 | 19.56 | 24.87 | 11.83 | 24.45 | 10.20 |
| 50th-Percentile Queue Length [ft/ln] | 149.71 | 213.66 | 391.16 | 301.14 | 128.59 | 117.14 | 46.60 | 489.12 | 621.66 | 295.80 | 611.27 | 254.94 |
| 95th-Percentile Queue Length [veh/ln] | 10.00 | 13.34 | 22.13 | 19.61 | 8.86 | 8.24 | 3.36 | 27.00 | 34.58 | 18.81 | 33.22 | 15.43 |
| 95th-Percentile Queue Length [ft/ln] | 250.04 | 333.52 | 553.34 | 490.30 | 221.57 | 205.89 | 83.88 | 674.93 | 864.50 | 470.30 | 830.52 | 385.87 |

**Movement, Approach, & Intersection Results**

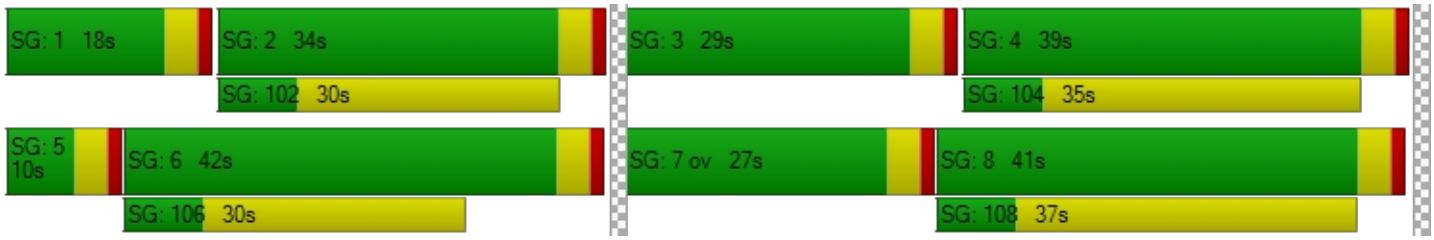
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 54.77 | 39.00 | 57.95 | 167.25 | 30.80 | 30.55 | 60.31 | 75.62 | 103.22 | 151.64 | 66.91 | 17.54 |
| Movement LOS | D | D | E | F | C | C | E | E | F | F | F | B |
| d_A, Approach Delay [s/veh] | 48.95 | | | 101.88 | | | 76.29 | | | 71.02 | | |
| Approach LOS | D | | | F | | | E | | | E | | |
| d_I, Intersection Delay [s/veh] | 71.94 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |
| Intersection V/C | 1.080 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.952 | 2.838 | 3.393 | 3.584 |
| Crosswalk LOS | C | C | C | D |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 616 | 583 | 500 | 633 |
| d_b, Bicycle Delay [s] | 28.73 | 30.13 | 33.78 | 28.04 |
| l_b,int, Bicycle LOS Score for Intersection | 2.811 | 2.321 | 2.523 | 3.292 |
| Bicycle LOS | C | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 18.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.813 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 764 | 0 | 614 | 0 | 1913 | 1142 | 0 | 2727 | 475 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 764 | 0 | 614 | 0 | 1913 | 1142 | 0 | 2727 | 475 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 191 | 0 | 154 | 0 | 478 | 286 | 0 | 682 | 119 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 764 | 0 | 614 | 0 | 1913 | 1142 | 0 | 2727 | 475 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_di, Inbound Pedestrian Volume crossing m | | 0 | | | 0 | | | 0 | | | 0 | |
| v_co, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ci, Inbound Pedestrian Volume crossing mi | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ab, Corner Pedestrian Volume [ped/h] | | 0 | | | 0 | | | 0 | | | 0 | |
| Bicycle Volume [bicycles/h] | | 0 | | | 0 | | | 0 | | | 0 | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 8.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 64 | 0 | 0 | 0 | 26 | 0 | 0 | 26 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | | No | |
| Maximum Recall | | | | No | | | | No | | | No | |
| Pedestrian Recall | | | | No | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | C | R | C | C |
|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 28 | 28 | 28 | 54 | 54 |
| g / C, Green / Cycle | | 0.31 | 0.31 | 0.31 | 0.60 | 0.60 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.26 | 0.26 | 0.24 | 0.34 | 0.48 |
| s, saturation flow rate [veh/h] | | 1750 | 1750 | 1900 | 5700 | 5700 |
| c, Capacity [veh/h] | | 547 | 547 | 594 | 3410 | 3410 |
| d1, Uniform Delay [s] | | 28.77 | 28.77 | 27.99 | 10.91 | 13.89 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 3.55 | 3.55 | 2.19 | 0.67 | 2.06 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.84 | 0.84 | 0.77 | 0.56 | 0.80 |
| d, Delay for Lane Group [s/veh] | | 32.32 | 32.32 | 30.17 | 11.58 | 15.95 |
| Lane Group LOS | | C | C | C | B | B |
| Critical Lane Group | | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | | 9.43 | 9.43 | 9.00 | 7.09 | 13.13 |
| 50th-Percentile Queue Length [ft/ln] | | 235.64 | 235.64 | 225.11 | 177.14 | 328.27 |
| 95th-Percentile Queue Length [veh/ln] | | 14.46 | 14.46 | 13.93 | 11.45 | 19.07 |
| 95th-Percentile Queue Length [ft/ln] | | 361.51 | 361.51 | 348.14 | 286.27 | 476.84 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 32.32 | 0.00 | 30.71 | 0.00 | 11.58 | 0.00 | 0.00 | 15.95 | 0.00 |
| Movement LOS | | | | C | | C | | B | | | B | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 31.60 | | | 11.58 | | | 15.95 | | |
| Approach LOS | A | | | C | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 18.15 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.813 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 0.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 0.00 | 34.63 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 0.000 | 2.466 | 0.000 | 0.000 |
| Crosswalk LOS | F | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 1335 | 489 | 489 |
| d_b, Bicycle Delay [s] | 44.96 | 4.98 | 25.65 | 25.65 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 3.833 | 2.612 | 3.059 |
| Bicycle LOS | D | D | B | C |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 26.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.824 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1151 | 64 | 506 | 0 | 0 | 193 | 183 | 2129 | 425 | 0 | 2807 | 38 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1151 | 64 | 506 | 0 | 0 | 193 | 183 | 2129 | 425 | 0 | 2807 | 38 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 288 | 16 | 127 | 0 | 0 | 48 | 46 | 532 | 106 | 0 | 702 | 10 |
| Total Analysis Volume [veh/h] | 1151 | 64 | 506 | 0 | 0 | 193 | 183 | 2129 | 425 | 0 | 2807 | 38 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 0 | 6 | 6 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 44 | 0 | 0 | 0 | 21 | 21 | 56 | 0 | 0 | 35 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | | No | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | | No | No | No | | | No | |
| Maximum Recall | | No | | | | No | No | No | | | No | |
| Pedestrian Recall | | No | | | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 30 | 30 | 30 | 12 | 12 | 62 | 45 | 45 |
| g / C, Green / Cycle | 0.30 | 0.30 | 0.30 | 0.12 | 0.12 | 0.62 | 0.45 | 0.45 |
| (v / s)_i Volume / Saturation Flow Rate | 0.24 | 0.25 | 0.23 | 0.05 | 0.10 | 0.37 | 0.37 | 0.37 |
| s, saturation flow rate [veh/h] | 3500 | 1750 | 1900 | 3800 | 1800 | 5700 | 5700 | 1900 |
| c, Capacity [veh/h] | 1059 | 530 | 575 | 469 | 222 | 3519 | 2587 | 862 |
| d1, Uniform Delay [s] | 32.09 | 32.40 | 31.57 | 40.47 | 42.76 | 11.69 | 23.84 | 23.84 |
| k, delay calibration | 0.11 | 0.18 | 0.14 | 0.11 | 0.11 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.45 | 5.43 | 2.79 | 0.58 | 7.45 | 0.78 | 3.15 | 8.83 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.80 | 0.82 | 0.76 | 0.41 | 0.82 | 0.60 | 0.82 | 0.82 |
| d, Delay for Lane Group [s/veh] | 33.54 | 37.83 | 34.36 | 41.05 | 50.22 | 12.47 | 26.98 | 32.67 |
| Lane Group LOS | C | D | C | D | D | B | C | C |
| Critical Lane Group | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 9.44 | 10.39 | 9.79 | 2.22 | 4.83 | 9.03 | 14.71 | 16.08 |
| 50th-Percentile Queue Length [ft/ln] | 235.93 | 259.74 | 244.79 | 55.51 | 120.84 | 225.67 | 367.87 | 401.92 |
| 95th-Percentile Queue Length [veh/ln] | 14.48 | 15.68 | 14.92 | 4.00 | 8.44 | 13.95 | 21.01 | 22.65 |
| 95th-Percentile Queue Length [ft/ln] | 361.89 | 391.89 | 373.09 | 99.91 | 210.98 | 348.85 | 525.15 | 566.31 |

**Movement, Approach, & Intersection Results**

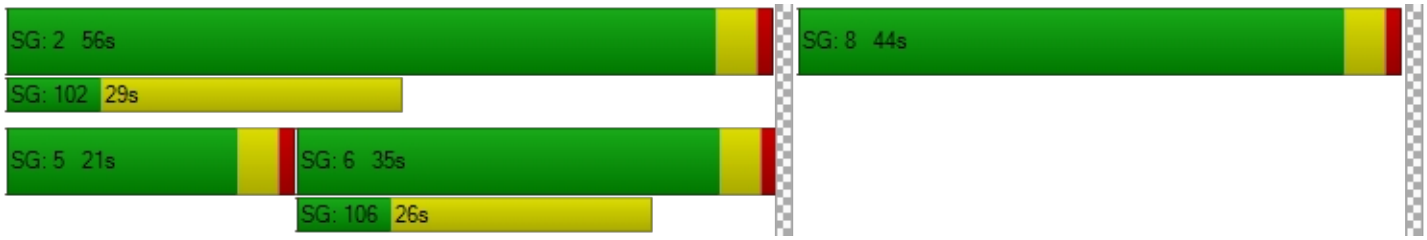
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 34.65 | 37.83 | 34.88 | 0.00 | 0.00 | 41.05 | 50.22 | 12.47 | 0.00 | 0.00 | 28.35 | 32.67 |
| Movement LOS | C | D | C | | | D | D | B | | | C | C |
| d_A, Approach Delay [s/veh] | 34.84 | | | 41.05 | | | 15.45 | | | 28.41 | | |
| Approach LOS | C | | | D | | | B | | | C | | |
| d_I, Intersection Delay [s/veh] | 26.08 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.824 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 39.61 | 39.61 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.640 | 2.100 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 800 | 340 | 1040 | 620 |
| d_b, Bicycle Delay [s] | 18.00 | 34.45 | 11.52 | 23.81 |
| l_b,int, Bicycle LOS Score for Intersection | 4.399 | 1.560 | 2.831 | 2.733 |
| Bicycle LOS | E | A | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 48.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.944 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 250 | 299 | 102 | 335 | 402 | 292 | 310 | 2167 | 160 | 210 | 1992 | 213 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 250 | 299 | 102 | 335 | 402 | 292 | 310 | 2167 | 160 | 210 | 1992 | 213 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 63 | 75 | 26 | 84 | 101 | 73 | 78 | 542 | 40 | 53 | 498 | 53 |
| Total Analysis Volume [veh/h] | 250 | 299 | 102 | 335 | 402 | 292 | 310 | 2167 | 160 | 210 | 1992 | 213 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 13 | 39 | 0 | 16 | 42 | 0 | 26 | 46 | 0 | 19 | 39 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 29 | 0 | 0 | 26 | 0 | 0 | 25 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 9 | 25 | 25 | 12 | 28 | 28 | 22 | 52 | 52 | 15 | 45 | 45 |
| g / C, Green / Cycle | 0.08 | 0.21 | 0.21 | 0.10 | 0.23 | 0.23 | 0.18 | 0.43 | 0.43 | 0.13 | 0.37 | 0.37 |
| (v / s)_i Volume / Saturation Flow Rate | 0.07 | 0.11 | 0.10 | 0.10 | 0.21 | 0.15 | 0.17 | 0.40 | 0.42 | 0.12 | 0.29 | 0.30 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 267 | 399 | 399 | 354 | 446 | 446 | 331 | 1634 | 817 | 227 | 2122 | 707 |
| d1, Uniform Delay [s] | 55.19 | 42.12 | 41.73 | 53.67 | 44.62 | 41.57 | 48.35 | 32.69 | 33.55 | 51.96 | 33.22 | 33.72 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.22 | 0.11 | 0.22 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 14.29 | 1.06 | 0.91 | 12.79 | 12.59 | 1.64 | 20.92 | 11.69 | 25.53 | 14.98 | 2.80 | 9.26 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.94 | 0.52 | 0.48 | 0.95 | 0.90 | 0.65 | 0.94 | 0.94 | 0.97 | 0.93 | 0.77 | 0.80 |
| d, Delay for Lane Group [s/veh] | 69.48 | 43.18 | 42.63 | 66.47 | 57.21 | 43.21 | 69.27 | 44.38 | 59.08 | 66.94 | 36.03 | 42.98 |
| Lane Group LOS | E | D | D | E | E | D | E | D | E | E | D | D |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 4.29 | 5.61 | 5.13 | 5.65 | 13.10 | 8.01 | 11.04 | 23.31 | 27.79 | 7.19 | 14.37 | 16.36 |
| 50th-Percentile Queue Length [ft/ln] | 107.29 | 140.36 | 128.17 | 141.27 | 327.55 | 200.34 | 275.97 | 582.79 | 694.71 | 179.78 | 359.37 | 409.08 |
| 95th-Percentile Queue Length [veh/ln] | 7.69 | 9.50 | 8.84 | 9.55 | 19.04 | 12.66 | 16.49 | 31.23 | 36.43 | 11.59 | 20.59 | 23.00 |
| 95th-Percentile Queue Length [ft/ln] | 192.22 | 237.51 | 221.01 | 238.73 | 475.95 | 316.41 | 412.20 | 780.74 | 910.84 | 289.73 | 514.82 | 574.93 |

**Movement, Approach, & Intersection Results**

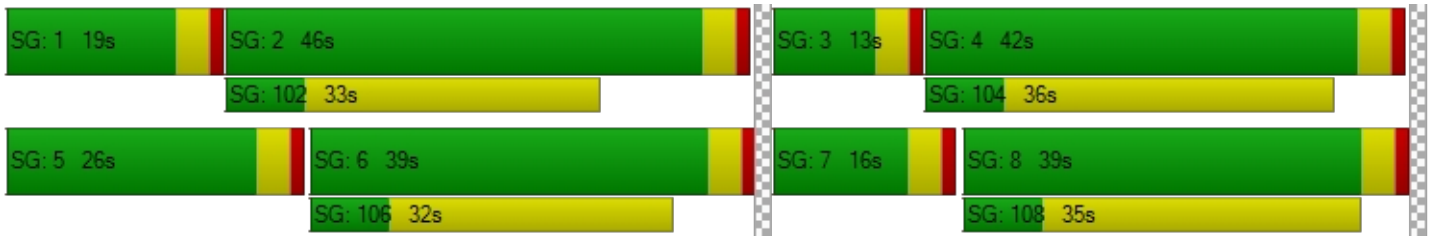
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 69.48 | 43.02 | 42.63 | 66.47 | 57.21 | 43.21 | 69.27 | 48.69 | 59.08 | 66.94 | 37.26 | 42.98 |
| Movement LOS | E | D | D | E | E | D | E | D | E | E | D | D |
| d_A, Approach Delay [s/veh] | 53.12 | | | 56.25 | | | 51.74 | | | 40.35 | | |
| Approach LOS | D | | | E | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 48.47 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.944 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.591 | 2.767 | 3.369 | 3.351 |
| Crosswalk LOS | B | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 583 | 633 | 700 | 583 |
| d_b, Bicycle Delay [s] | 30.13 | 28.04 | 25.38 | 30.13 |
| l_b,int, Bicycle LOS Score for Intersection | 2.097 | 3.257 | 3.010 | 2.556 |
| Bicycle LOS | B | C | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 28.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.847 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 290 | 54 | 310 | 29 | 26 | 16 | 22 | 2188 | 318 | 268 | 2258 | 66 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 290 | 54 | 310 | 29 | 26 | 16 | 22 | 2188 | 318 | 268 | 2258 | 66 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 73 | 14 | 78 | 7 | 7 | 4 | 6 | 547 | 80 | 67 | 565 | 17 |
| Total Analysis Volume [veh/h] | 290 | 54 | 310 | 29 | 26 | 16 | 22 | 2188 | 318 | 268 | 2258 | 66 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 105 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 28 | 0 | 0 | 10 | 0 | 10 | 32 | 0 | 35 | 57 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 14 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 20 | 20 | 20 | 5 | 5 | 3 | 46 | 46 | 18 | 61 | 61 |
| g / C, Green / Cycle | 0.19 | 0.19 | 0.19 | 0.05 | 0.05 | 0.03 | 0.44 | 0.44 | 0.17 | 0.58 | 0.58 |
| (v / s)_i Volume / Saturation Flow Rate | 0.10 | 0.10 | 0.16 | 0.02 | 0.02 | 0.01 | 0.38 | 0.17 | 0.15 | 0.40 | 0.42 |
| s, saturation flow rate [veh/h] | 1750 | 1750 | 1900 | 1800 | 1900 | 1800 | 5700 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 326 | 326 | 354 | 92 | 97 | 51 | 2511 | 837 | 306 | 2213 | 1106 |
| d1, Uniform Delay [s] | 38.56 | 38.62 | 41.58 | 48.12 | 48.41 | 50.25 | 26.70 | 19.76 | 42.54 | 15.33 | 15.80 |
| k, delay calibration | 0.11 | 0.11 | 0.14 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.30 | 1.34 | 8.47 | 1.95 | 3.05 | 5.74 | 4.51 | 1.31 | 7.85 | 1.79 | 4.06 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.52 | 0.53 | 0.88 | 0.32 | 0.43 | 0.43 | 0.87 | 0.38 | 0.88 | 0.69 | 0.72 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 39.87 | 39.96 | 50.05 | 50.07 | 51.46 | 55.99 | 31.21 | 21.07 | 50.39 | 17.11 | 19.86 |
| Lane Group LOS | D | D | D | D | D | E | C | C | D | B | B |
| Critical Lane Group | No | No | Yes | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 4.06 | 4.13 | 8.55 | 0.78 | 1.15 | 0.65 | 16.96 | 5.44 | 7.39 | 12.41 | 14.02 |
| 50th-Percentile Queue Length [ft/ln] | 101.60 | 103.15 | 213.82 | 19.54 | 28.71 | 16.22 | 424.01 | 135.98 | 184.74 | 310.37 | 350.52 |
| 95th-Percentile Queue Length [veh/ln] | 7.32 | 7.43 | 13.35 | 1.41 | 2.07 | 1.17 | 23.71 | 9.26 | 11.85 | 18.19 | 20.16 |
| 95th-Percentile Queue Length [ft/ln] | 182.89 | 185.66 | 333.72 | 35.17 | 51.67 | 29.19 | 592.86 | 231.60 | 296.19 | 454.83 | 504.05 |

**Movement, Approach, & Intersection Results**

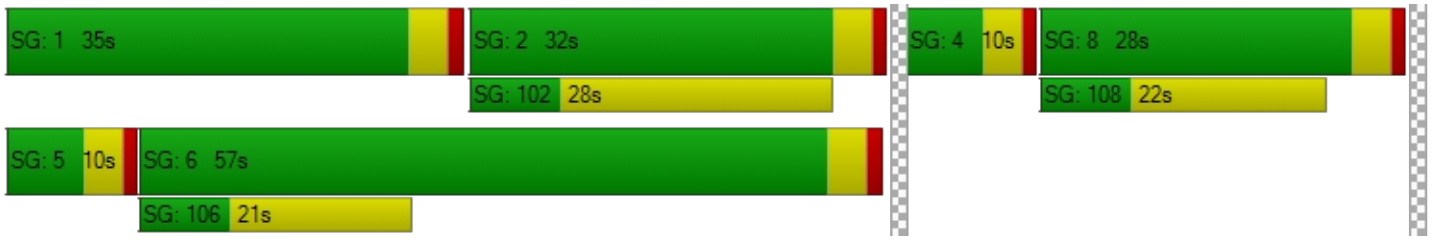
| d_M, Delay for Movement [s/veh] | 39.90 | 39.96 | 50.05 | 50.07 | 51.46 | 51.46 | 55.99 | 31.21 | 21.07 | 50.39 | 18.00 | 19.86 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | D | D | D | D | D | D | E | C | C | D | B | B |
| d_A, Approach Delay [s/veh] | 44.72 | | | 50.89 | | | 30.15 | | | 21.40 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 28.15 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.847 | | | | | | | | | | | |

**Other Modes**

| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
|---|---|---|---|---|
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 42.11 | 42.11 | 0.00 | 42.11 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.447 | 2.017 | 0.000 | 3.314 |
| Crosswalk LOS | B | B | F | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 457 | 114 | 533 | 1009 |
| d_b, Bicycle Delay [s] | 31.27 | 46.70 | 28.26 | 12.90 |
| l_b,int, Bicycle LOS Score for Intersection | 2.639 | 1.677 | 2.950 | 2.985 |
| Bicycle LOS | B | A | C | C |

## Sequence

| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



Brea Mall Expansion, Brea

Vistro File: N:\...\4099 HCM Network.vistro
Report File: N:\...\Sat 2045+P.pdf

Scenario 15 Sat MD 2045+P
4/18/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | State College Boulevard at Lambert Road | Signalized | HCM 6th Edition | WB Left | 0.852 | 49.3 | D |
| 2 | SR-57 SB Ramps at Lambert Road | Signalized | HCM 6th Edition | WB Left | 0.791 | 30.2 | C |
| 3 | SR-57 NB Ramps at Lambert Road | Signalized | HCM 6th Edition | NB Left | 0.775 | 19.5 | B |
| 4 | Randolph Avenue at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.501 | 19.1 | B |
| 5 | State College Boulevard at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.786 | 41.7 | D |
| 6 | S Associated Road at Birch Street | Signalized | HCM 6th Edition | EB Left | 0.598 | 21.1 | C |
| 7 | Randolph Avenue at Madison Way | Signalized | HCM 6th Edition | WB Left | 0.271 | 16.8 | B |
| 8 | Randolph Avenue at Brea Mall | Signalized | HCM 6th Edition | EB Left | 0.529 | 24.4 | C |
| 9 | Brea Mall South at State College Boulevard | Signalized | HCM 6th Edition | WB Left | 0.833 | 32.4 | C |
| 10 | Harbor Boulevard at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.896 | 53.4 | D |
| 11 | Puente Street at Imperial Highway | Signalized | HCM 6th Edition | EB Left | 0.481 | 13.2 | B |
| 12 | Brea Boulevard at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.874 | 45.0 | D |
| 13 | Randolph Avenue at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.927 | 47.2 | D |
| 14 | State College Boulevard at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 1.408 | 148.1 | F |
| 15 | SR-57 SB Ramps at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.845 | 20.7 | C |
| 16 | SR-57 NB Ramps at Imperial Highway | Signalized | HCM 6th Edition | EB Left | 0.952 | 42.6 | D |
| 17 | Associated Road at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 0.842 | 35.9 | D |
| 18 | Castlegate Lane/Placentia | Signalized | HCM 6th | EB Left | 0.811 | 23.7 | C |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16 | Avenue at Imperial Highway | Signalized | Edition | EB Left | 0.611 | 23.7 | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 1: State College Boulevard at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 49.3 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.852 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 154 | 294 | 417 | 574 | 408 | 5 | 20 | 1322 | 290 | 784 | 1745 | 789 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 154 | 294 | 417 | 574 | 408 | 5 | 20 | 1322 | 290 | 784 | 1745 | 789 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 39 | 74 | 104 | 144 | 102 | 1 | 5 | 331 | 73 | 196 | 436 | 197 |
| Total Analysis Volume [veh/h] | 154 | 294 | 417 | 574 | 408 | 5 | 20 | 1322 | 290 | 784 | 1745 | 789 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 10 | 32 | 0 | 22 | 44 | 0 | 10 | 40 | 0 | 26 | 56 | 56 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 28 | 0 | 0 | 22 | 22 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 6 | 20 | 20 | 20 | 18 | 31 | 31 | 3 | 44 | 44 | 22 | 64 | 86 |
| g / C, Green / Cycle | 0.05 | 0.16 | 0.16 | 0.16 | 0.15 | 0.26 | 0.26 | 0.02 | 0.37 | 0.37 | 0.18 | 0.53 | 0.71 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.14 | 0.12 | 0.12 | 0.16 | 0.11 | 0.11 | 0.01 | 0.21 | 0.21 | 0.22 | 0.31 | 0.42 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1900 | 3500 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 178 | 309 | 309 | 309 | 526 | 498 | 498 | 88 | 2110 | 703 | 642 | 3012 | 1353 |
| d1, Uniform Delay [s] | 56.58 | 48.79 | 47.80 | 47.66 | 51.01 | 36.66 | 36.64 | 57.36 | 30.27 | 30.09 | 49.02 | 19.24 | 8.51 |
| k, delay calibration | 0.11 | 0.12 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 11.90 | 6.94 | 3.39 | 3.15 | 48.47 | 0.55 | 0.55 | 1.28 | 1.15 | 3.25 | 102.57 | 0.82 | 1.84 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.87 | 0.84 | 0.74 | 0.72 | 1.09 | 0.42 | 0.41 | 0.23 | 0.58 | 0.56 | 1.22 | 0.58 | 0.58 |
| d, Delay for Lane Group [s/veh] | 68.48 | 55.73 | 51.19 | 50.81 | 99.47 | 37.21 | 37.19 | 58.65 | 31.42 | 33.34 | 151.58 | 20.06 | 10.36 |
| Lane Group LOS | E | E | D | D | F | D | D | E | C | C | F | C | B |
| Critical Lane Group | No | Yes | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.61 | 8.18 | 6.76 | 6.58 | 11.42 | 5.12 | 5.09 | 0.31 | 9.55 | 9.70 | 18.72 | 10.97 | 9.73 |
| 50th-Percentile Queue Length [ft/ln] | 65.29 | 204.4 | 168.8 | 164.4 | 285.51 | 127.95 | 127.33 | 7.84 | 238.75 | 242.61 | 468.07 | 274.32 | 243.30 |
| 95th-Percentile Queue Length [veh/ln] | 4.70 | 12.87 | 11.02 | 10.78 | 17.65 | 8.83 | 8.79 | 0.56 | 14.62 | 14.81 | 28.40 | 16.41 | 14.85 |
| 95th-Percentile Queue Length [ft/ln] | 117.5 | 321.7 | 275.4 | 269.6 | 441.25 | 220.70 | 219.86 | 14.12 | 365.45 | 370.34 | 709.96 | 410.14 | 371.21 |

**Movement, Approach, & Intersection Results**

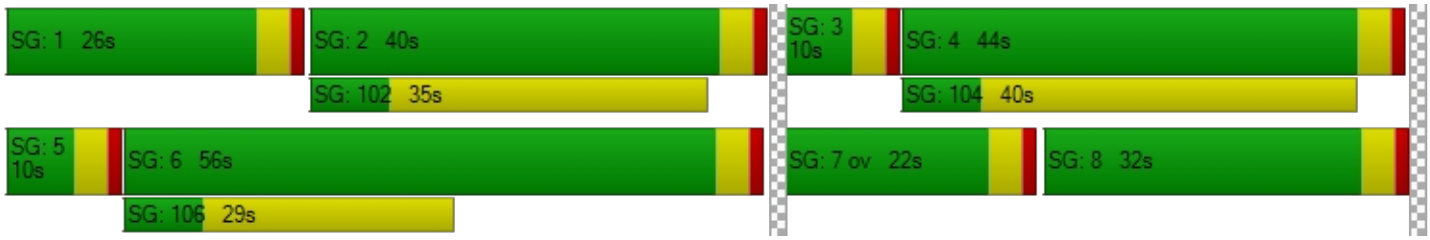
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 68.48 | 55.22 | 50.98 | 99.47 | 37.20 | 37.19 | 58.65 | 31.58 | 33.34 | 151.58 | 20.06 | 10.36 |
| Movement LOS | E | E | D | F | D | D | E | C | C | F | C | B |
| d_A, Approach Delay [s/veh] | 55.54 | | | 73.42 | | | 32.22 | | | 48.83 | | |
| Approach LOS | E | | | E | | | C | | | D | | |
| d_I, Intersection Delay [s/veh] | 49.27 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.852 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.935 | 2.806 | 3.246 | 0.000 |
| Crosswalk LOS | C | C | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 467 | 666 | 600 | 866 |
| d_b, Bicycle Delay [s] | 35.28 | 26.68 | 29.41 | 19.28 |
| l_b,int, Bicycle LOS Score for Intersection | 2.273 | 2.374 | 2.233 | 3.385 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 2: SR-57 SB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 30.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.791 |

**Intersection Setup**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 SB Ramps | | | SR-57 SB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 900 | 0 | 1311 | 0 | 1689 | 609 | 246 | 2003 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 900 | 0 | 1311 | 0 | 1689 | 609 | 246 | 2003 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 225 | 0 | 328 | 0 | 422 | 152 | 62 | 501 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 900 | 0 | 1311 | 0 | 1689 | 609 | 246 | 2003 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 79 | 0 | 0 | 0 | 23 | 0 | 18 | 41 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 20 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | No | No | |
| Maximum Recall | | | | No | | | | No | | No | No | |
| Pedestrian Recall | | | | No | | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | R | C | R | L | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 52 | 52 | 46 | 46 | 11 | 60 |
| g / C, Green / Cycle | | 0.43 | 0.43 | 0.38 | 0.38 | 0.09 | 0.50 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.26 | 0.35 | 0.30 | 0.16 | 0.07 | 0.35 |
| s, saturation flow rate [veh/h] | | 3500 | 3800 | 5700 | 3800 | 3500 | 5700 |
| c, Capacity [veh/h] | | 1509 | 1639 | 2171 | 1447 | 307 | 2862 |
| d1, Uniform Delay [s] | | 26.11 | 29.62 | 32.66 | 27.37 | 53.67 | 22.92 |
| k, delay calibration | | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 0.38 | 0.94 | 2.83 | 0.90 | 4.81 | 1.45 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.60 | 0.80 | 0.78 | 0.42 | 0.80 | 0.70 |
| d, Delay for Lane Group [s/veh] | | 26.49 | 30.55 | 35.49 | 28.27 | 58.48 | 24.38 |
| Lane Group LOS | | C | C | D | C | E | C |
| Critical Lane Group | | No | Yes | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | | 9.81 | 16.29 | 14.77 | 6.62 | 3.85 | 14.50 |
| 50th-Percentile Queue Length [ft/ln] | | 245.25 | 407.23 | 369.19 | 165.42 | 96.15 | 362.55 |
| 95th-Percentile Queue Length [veh/ln] | | 14.95 | 22.91 | 21.07 | 10.84 | 6.92 | 20.75 |
| 95th-Percentile Queue Length [ft/ln] | | 373.67 | 572.70 | 526.75 | 270.88 | 173.07 | 518.69 |

**Movement, Approach, & Intersection Results**

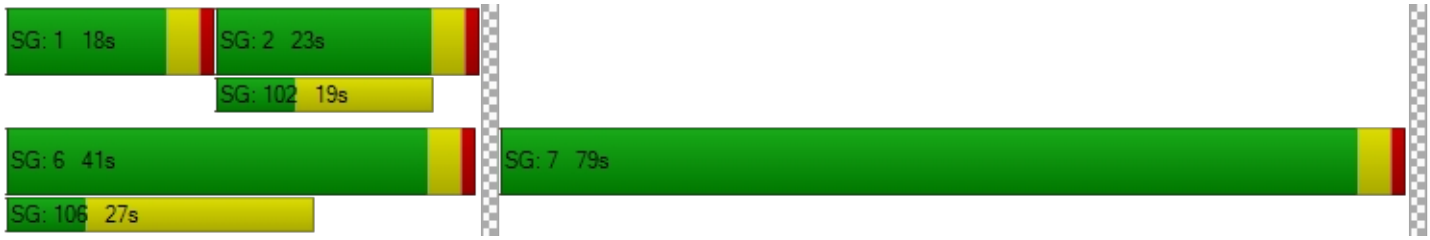
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 26.49 | 0.00 | 30.55 | 0.00 | 35.49 | 28.27 | 58.48 | 24.38 | 0.00 |
| Movement LOS | | | | C | | C | | D | C | E | C | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 28.90 | | | 33.58 | | | 28.11 | | |
| Approach LOS | A | | | C | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 30.23 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.791 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.49 | 49.49 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.145 | 2.684 | 0.000 | 0.000 |
| Crosswalk LOS | B | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 1250 | 317 | 617 |
| d_b, Bicycle Delay [s] | 59.98 | 8.43 | 42.49 | 28.69 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 1.560 | 2.824 | 2.797 |
| Bicycle LOS | D | A | C | C |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 3: SR-57 NB Ramps at Lambert Road**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 19.5 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.775 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | | | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | | | | No | | | No | | |
| Crosswalk | Yes | | | No | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | SR-57 NB Ramps | | | Lambert Road | | | Lambert Road | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1159 | 0 | 519 | 0 | 0 | 0 | 0 | 1831 | 758 | 0 | 1068 | 473 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1159 | 0 | 519 | 0 | 0 | 0 | 0 | 1831 | 758 | 0 | 1068 | 473 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 |
| Total 15-Minute Volume [veh/h] | 290 | 0 | 130 | 0 | 0 | 0 | 0 | 458 | 190 | 0 | 267 | 0 |
| Total Analysis Volume [veh/h] | 1159 | 0 | 519 | 0 | 0 | 0 | 0 | 1831 | 758 | 0 | 1068 | 0 |
| Presence of On-Street Parking | No | | No | | | | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Permiss | Split | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 54 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 36 | 0 |
| Vehicle Extension [s] | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | No | | | | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | | | | | | | No | | | No | |
| Maximum Recall | No | | | | | | | No | | | No | |
| Pedestrian Recall | No | | | | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | R | | C | C | R | C |
|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 35 | 35 | | 47 | 47 | 47 | 47 |
| g / C, Green / Cycle | 0.39 | 0.39 | | 0.52 | 0.52 | 0.52 | 0.52 |
| (v / s)_i Volume / Saturation Flow Rate | 0.33 | 0.27 | | 0.34 | 0.34 | 0.34 | 0.19 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | | 3800 | 1900 | 1900 | 5700 |
| c, Capacity [veh/h] | 1364 | 740 | | 1981 | 990 | 990 | 2971 |
| d1, Uniform Delay [s] | 25.01 | 23.02 | | 15.61 | 15.61 | 15.61 | 12.67 |
| k, delay calibration | 0.11 | 0.11 | | 0.50 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.58 | 1.22 | | 1.70 | 3.36 | 3.36 | 0.34 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.85 | 0.70 | | 0.65 | 0.65 | 0.65 | 0.36 |
| d, Delay for Lane Group [s/veh] | 26.59 | 24.24 | | 17.31 | 18.97 | 18.97 | 13.01 |
| Lane Group LOS | C | C | | B | B | B | B |
| Critical Lane Group | Yes | No | | Yes | No | No | No |
| 50th-Percentile Queue Length [veh/ln] | 10.99 | 9.07 | | 9.38 | 9.84 | 9.84 | 4.07 |
| 50th-Percentile Queue Length [ft/ln] | 274.87 | 226.66 | | 234.60 | 246.02 | 246.02 | 101.83 |
| 95th-Percentile Queue Length [veh/ln] | 16.43 | 14.00 | | 14.41 | 14.99 | 14.99 | 7.33 |
| 95th-Percentile Queue Length [ft/ln] | 410.83 | 350.11 | | 360.20 | 374.64 | 374.64 | 183.29 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 26.59 | 0.00 | 24.24 | 0.00 | 0.00 | 0.00 | 0.00 | 17.40 | 18.97 | 0.00 | 13.01 | 0.00 |
| Movement LOS | C | | C | | | | | B | B | | B | |
| d_A, Approach Delay [s/veh] | 25.86 | | | 0.00 | | | 18.14 | | | 13.01 | | |
| Approach LOS | C | | | A | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 19.54 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.775 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 0.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.63 | 0.00 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.774 | 0.000 | 0.000 | 0.000 |
| Crosswalk LOS | C | F | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1112 | 0 | 712 | 712 |
| d_b, Bicycle Delay [s] | 8.86 | 44.96 | 18.65 | 18.65 |
| l_b,int, Bicycle LOS Score for Intersection | 1.560 | 4.132 | 2.984 | 2.147 |
| Bicycle LOS | A | D | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 4: Randolph Avenue at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 19.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.501 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 120 | 82 | 194 | 63 | 40 | 92 | 93 | 739 | 140 | 169 | 895 | 27 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 120 | 82 | 194 | 63 | 40 | 92 | 93 | 739 | 140 | 169 | 895 | 27 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 30 | 21 | 49 | 16 | 10 | 23 | 23 | 185 | 35 | 42 | 224 | 7 |
| Total Analysis Volume [veh/h] | 120 | 82 | 194 | 63 | 40 | 92 | 93 | 739 | 140 | 169 | 895 | 27 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 38 | 0 | 0 | 38 | 0 | 23 | 30 | 0 | 22 | 29 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 25 | 0 | 0 | 19 | 0 | 0 | 18 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 12 | 12 | 12 | 12 | 12 | 6 | 56 | 56 | 10 | 60 | 60 |
| g / C, Green / Cycle | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.07 | 0.62 | 0.62 | 0.12 | 0.67 | 0.67 |
| (v / s)_i Volume / Saturation Flow Rate | 0.07 | 0.04 | 0.10 | 0.04 | 0.07 | 0.05 | 0.24 | 0.22 | 0.09 | 0.24 | 0.01 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 170 | 250 | 250 | 215 | 250 | 124 | 1177 | 1177 | 209 | 2532 | 1266 |
| d1, Uniform Delay [s] | 36.40 | 35.51 | 37.84 | 35.21 | 36.51 | 41.18 | 8.56 | 8.42 | 38.86 | 6.56 | 5.09 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.31 | 0.76 | 5.14 | 0.75 | 1.73 | 8.72 | 0.95 | 0.87 | 7.34 | 0.39 | 0.03 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.71 | 0.33 | 0.78 | 0.29 | 0.53 | 0.75 | 0.38 | 0.36 | 0.81 | 0.35 | 0.02 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 41.71 | 36.27 | 42.97 | 35.95 | 38.24 | 49.90 | 9.51 | 9.29 | 46.21 | 6.95 | 5.12 |
| Lane Group LOS | D | D | D | D | D | D | A | A | D | A | A |
| Critical Lane Group | No | No | Yes | No | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.67 | 1.67 | 4.43 | 1.28 | 2.79 | 2.30 | 4.23 | 3.92 | 4.02 | 3.31 | 0.16 |
| 50th-Percentile Queue Length [ft/ln] | 66.86 | 41.71 | 110.74 | 31.88 | 69.85 | 57.59 | 105.69 | 98.12 | 100.38 | 82.83 | 3.99 |
| 95th-Percentile Queue Length [veh/ln] | 4.81 | 3.00 | 7.88 | 2.30 | 5.03 | 4.15 | 7.60 | 7.06 | 7.23 | 5.96 | 0.29 |
| 95th-Percentile Queue Length [ft/ln] | 120.35 | 75.07 | 197.03 | 57.39 | 125.74 | 103.67 | 189.99 | 176.62 | 180.68 | 149.10 | 7.18 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 41.71 | 36.27 | 42.97 | 35.95 | 38.24 | 38.24 | 49.90 | 9.42 | 9.29 | 46.21 | 6.95 | 5.12 |
| Movement LOS | D | D | D | D | D | D | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 41.20 | | | 37.50 | | | 13.28 | | | 12.98 | | |
| Approach LOS | D | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 19.10 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.501 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.70 | 34.70 | 34.70 | 34.70 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.312 | 2.069 | 2.875 | 2.881 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 755 | 755 | 577 | 555 |
| d_b, Bicycle Delay [s] | 17.44 | 17.44 | 22.78 | 23.49 |
| l_b,int, Bicycle LOS Score for Intersection | 2.213 | 1.881 | 2.362 | 2.460 |
| Bicycle LOS | B | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 5: State College Boulevard at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 41.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.786 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 165 | 353 | 212 | 301 | 651 | 531 | 321 | 827 | 180 | 185 | 795 | 270 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 165 | 353 | 212 | 301 | 651 | 531 | 321 | 827 | 180 | 185 | 795 | 270 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 41 | 88 | 53 | 75 | 163 | 133 | 80 | 207 | 45 | 46 | 199 | 68 |
| Total Analysis Volume [veh/h] | 165 | 353 | 212 | 301 | 651 | 531 | 321 | 827 | 180 | 185 | 795 | 270 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 115 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 10 | 39 | 0 | 23 | 52 | 0 | 14 | 42 | 0 | 11 | 39 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 6 | 35 | 35 | 12 | 41 | 41 | 10 | 45 | 45 | 7 | 42 | 42 |
| g / C, Green / Cycle | 0.05 | 0.30 | 0.30 | 0.11 | 0.36 | 0.36 | 0.09 | 0.39 | 0.39 | 0.06 | 0.37 | 0.37 |
| (v / s)_i Volume / Saturation Flow Rate | 0.05 | 0.09 | 0.11 | 0.09 | 0.33 | 0.29 | 0.09 | 0.22 | 0.09 | 0.05 | 0.21 | 0.14 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 3500 | 1900 | 1900 | 3500 | 3800 | 1900 | 3500 | 3800 | 1900 |
| c, Capacity [veh/h] | 184 | 1149 | 574 | 372 | 677 | 677 | 305 | 1486 | 743 | 214 | 1387 | 693 |
| d1, Uniform Delay [s] | 54.19 | 30.86 | 31.51 | 50.26 | 35.54 | 33.74 | 52.50 | 27.27 | 23.56 | 53.52 | 29.33 | 27.04 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.31 | 0.25 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 14.10 | 0.15 | 0.40 | 4.22 | 14.16 | 5.69 | 38.56 | 1.51 | 0.77 | 9.86 | 1.73 | 1.64 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.90 | 0.31 | 0.37 | 0.81 | 0.92 | 0.82 | 1.05 | 0.56 | 0.24 | 0.86 | 0.57 | 0.39 |
| d, Delay for Lane Group [s/veh] | 68.29 | 31.01 | 31.91 | 54.49 | 49.70 | 39.43 | 91.06 | 28.77 | 24.34 | 63.38 | 31.06 | 28.68 |
| Lane Group LOS | E | C | C | D | D | D | F | C | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 2.73 | 3.80 | 4.69 | 4.45 | 19.13 | 15.00 | 6.03 | 9.07 | 3.45 | 2.94 | 9.08 | 5.79 |
| 50th-Percentile Queue Length [ft/ln] | 68.30 | 94.95 | 117.29 | 111.14 | 478.16 | 375.01 | 150.83 | 226.75 | 86.36 | 73.54 | 227.03 | 144.86 |
| 95th-Percentile Queue Length [veh/ln] | 4.92 | 6.84 | 8.24 | 7.90 | 26.30 | 21.35 | 10.24 | 14.01 | 6.22 | 5.30 | 14.02 | 9.74 |
| 95th-Percentile Queue Length [ft/ln] | 122.94 | 170.92 | 206.10 | 197.59 | 657.47 | 533.81 | 255.95 | 350.22 | 155.45 | 132.38 | 350.58 | 243.55 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 68.29 | 31.01 | 31.91 | 54.49 | 49.29 | 39.43 | 91.06 | 28.77 | 24.34 | 63.38 | 31.06 | 28.68 |
| Movement LOS | E | C | C | D | D | D | F | C | C | E | C | C |
| d_A, Approach Delay [s/veh] | 39.70 | | | 46.81 | | | 43.23 | | | 35.33 | | |
| Approach LOS | D | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 41.74 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.786 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 47.04 | 47.04 | 47.04 | 47.04 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.849 | 2.859 | 2.998 | 2.966 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 609 | 835 | 661 | 609 |
| d_b, Bicycle Delay [s] | 27.84 | 19.53 | 25.79 | 27.84 |
| l_b,int, Bicycle LOS Score for Intersection | 2.162 | 2.783 | 2.655 | 2.591 |
| Bicycle LOS | B | C | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 6: S Associated Road at Birch Street**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 21.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.598 |

**Intersection Setup**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | S Associated Road | | | S Associated Road | | | Birch Street | | | Birch Street | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 358 | 21 | 179 | 13 | 23 | 17 | 11 | 867 | 371 | 161 | 860 | 15 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 358 | 21 | 179 | 13 | 23 | 17 | 11 | 867 | 371 | 161 | 860 | 15 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 90 | 5 | 45 | 3 | 6 | 4 | 3 | 217 | 93 | 40 | 215 | 4 |
| Total Analysis Volume [veh/h] | 358 | 21 | 179 | 13 | 23 | 17 | 11 | 867 | 371 | 161 | 860 | 15 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 110 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 8 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | |
| Lead / Lag | Lead | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 6 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 30 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 24 | 61 | 61 | 0 | 37 | 0 | 10 | 39 | 0 | 10 | 39 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 7 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 26 | 0 | 26 | 0 | 0 | 27 | 0 | 0 | 26 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | No | | No | | No | No | | No | No | |
| Maximum Recall | No | No | No | | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | No | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 14 | 22 | 32 | 5 | 5 | 2 | 70 | 70 | 6 | 74 | 74 |
| g / C, Green / Cycle | 0.12 | 0.20 | 0.30 | 0.04 | 0.04 | 0.02 | 0.63 | 0.63 | 0.05 | 0.67 | 0.67 |
| (v / s)_i Volume / Saturation Flow Rate | 0.10 | 0.01 | 0.09 | 0.01 | 0.02 | 0.01 | 0.34 | 0.31 | 0.05 | 0.23 | 0.23 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 |
| c, Capacity [veh/h] | 434 | 389 | 562 | 100 | 84 | 29 | 1200 | 1200 | 192 | 1273 | 1273 |
| d1, Uniform Delay [s] | 47.03 | 35.20 | 30.11 | 50.63 | 51.35 | 53.59 | 11.36 | 10.84 | 51.51 | 7.78 | 7.77 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.00 | 0.06 | 0.32 | 0.58 | 4.13 | 7.97 | 1.75 | 1.44 | 9.23 | 0.74 | 0.73 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.82 | 0.05 | 0.32 | 0.13 | 0.48 | 0.38 | 0.54 | 0.49 | 0.84 | 0.34 | 0.34 |
| d, Delay for Lane Group [s/veh] | 51.03 | 35.25 | 30.43 | 51.21 | 55.48 | 61.56 | 13.11 | 12.28 | 60.75 | 8.52 | 8.50 |
| Lane Group LOS | D | D | C | D | E | E | B | B | E | A | A |
| Critical Lane Group | Yes | No | No | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 5.01 | 0.46 | 3.74 | 0.36 | 1.17 | 0.37 | 8.83 | 7.62 | 2.44 | 4.36 | 4.32 |
| 50th-Percentile Queue Length [ft/ln] | 125.13 | 11.53 | 93.40 | 9.03 | 29.31 | 9.13 | 220.81 | 190.46 | 61.03 | 108.93 | 108.07 |
| 95th-Percentile Queue Length [veh/ln] | 8.67 | 0.83 | 6.73 | 0.65 | 2.11 | 0.66 | 13.71 | 12.14 | 4.39 | 7.78 | 7.73 |
| 95th-Percentile Queue Length [ft/ln] | 216.85 | 20.76 | 168.13 | 16.25 | 52.76 | 16.43 | 342.66 | 303.62 | 109.85 | 194.51 | 193.32 |

**Movement, Approach, & Intersection Results**

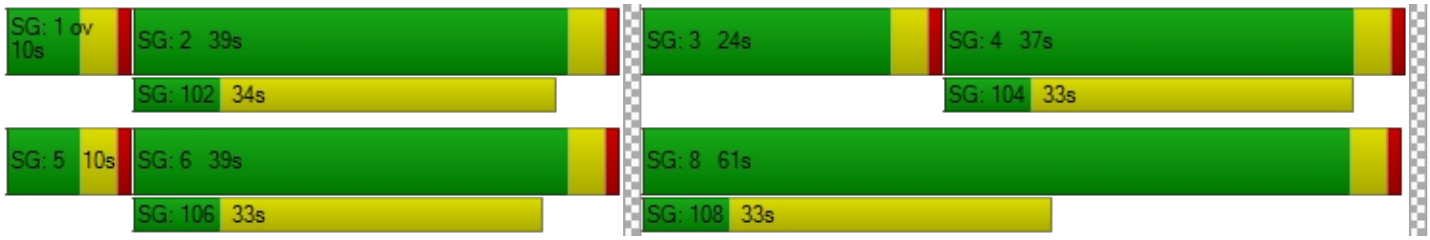
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 51.03 | 35.25 | 30.43 | 51.21 | 55.48 | 55.48 | 61.56 | 12.90 | 12.28 | 60.75 | 8.51 | 8.50 |
| Movement LOS | D | D | C | D | E | E | E | B | B | E | A | A |
| d_A, Approach Delay [s/veh] | 43.83 | | | 54.43 | | | 13.14 | | | 16.63 | | |
| Approach LOS | D | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 21.06 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.598 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 44.56 | 44.56 | 44.56 | 44.56 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.643 | 1.982 | 2.794 | 2.821 |
| Crosswalk LOS | B | A | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 1036 | 600 | 636 | 636 |
| d_b, Bicycle Delay [s] | 12.78 | 26.96 | 25.58 | 25.58 |
| l_b,int, Bicycle LOS Score for Intersection | 2.480 | 1.647 | 2.590 | 2.414 |
| Bicycle LOS | B | A | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 7: Randolph Avenue at Madison Way**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 16.8 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.271 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Madison Way | | | Madison Way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 23 | 410 | 120 | 76 | 288 | 25 | 40 | 12 | 63 | 87 | 4 | 60 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 23 | 410 | 120 | 76 | 288 | 25 | 40 | 12 | 63 | 87 | 4 | 60 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 6 | 103 | 30 | 19 | 72 | 6 | 10 | 3 | 16 | 22 | 1 | 15 |
| Total Analysis Volume [veh/h] | 23 | 410 | 120 | 76 | 288 | 25 | 40 | 12 | 63 | 87 | 4 | 60 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 26 | 0 | 10 | 26 | 0 | 0 | 54 | 0 | 0 | 54 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 12 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | L | C | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 3 | 66 | 66 | 5 | 69 | 69 | 6 | 6 | 6 | 6 |
| g / C, Green / Cycle | 0.03 | 0.74 | 0.74 | 0.06 | 0.77 | 0.77 | 0.07 | 0.07 | 0.07 | 0.07 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.14 | 0.13 | 0.04 | 0.08 | 0.08 | 0.02 | 0.04 | 0.05 | 0.03 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 55 | 1401 | 1401 | 104 | 1453 | 1453 | 118 | 136 | 107 | 136 |
| d1, Uniform Delay [s] | 42.88 | 3.63 | 3.59 | 41.73 | 2.72 | 2.72 | 39.68 | 40.39 | 40.77 | 40.15 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.05 | 0.31 | 0.29 | 9.39 | 0.15 | 0.15 | 1.69 | 3.44 | 13.36 | 2.50 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.42 | 0.20 | 0.18 | 0.73 | 0.11 | 0.11 | 0.34 | 0.55 | 0.81 | 0.47 |
| d, Delay for Lane Group [s/veh] | 47.93 | 3.94 | 3.88 | 51.12 | 2.87 | 2.86 | 41.37 | 43.83 | 54.13 | 42.65 |
| Lane Group LOS | D | A | A | D | A | A | D | D | D | D |
| Critical Lane Group | No | Yes | No | Yes | No | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.57 | 1.29 | 1.20 | 1.91 | 0.57 | 0.56 | 0.89 | 1.72 | 2.26 | 1.44 |
| 50th-Percentile Queue Length [ft/ln] | 14.37 | 32.31 | 29.94 | 47.83 | 14.34 | 14.06 | 22.19 | 42.96 | 56.45 | 36.05 |
| 95th-Percentile Queue Length [veh/ln] | 1.03 | 2.33 | 2.16 | 3.44 | 1.03 | 1.01 | 1.60 | 3.09 | 4.06 | 2.60 |
| 95th-Percentile Queue Length [ft/ln] | 25.87 | 58.15 | 53.90 | 86.10 | 25.81 | 25.31 | 39.93 | 77.32 | 101.61 | 64.88 |

**Movement, Approach, & Intersection Results**

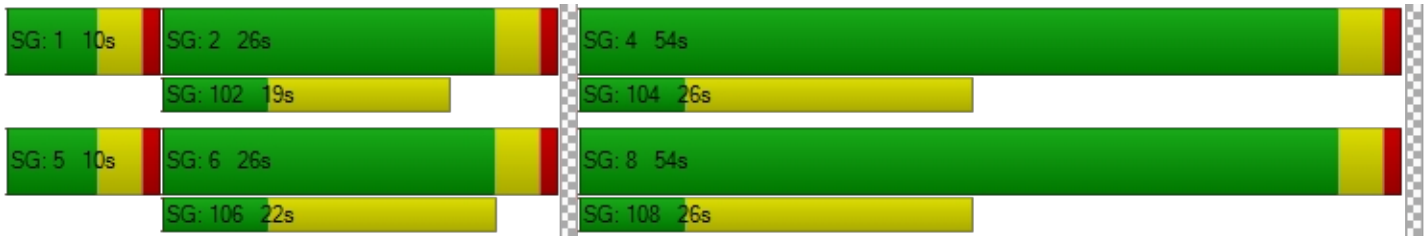
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 47.93 | 3.92 | 3.88 | 51.12 | 2.87 | 2.86 | 41.37 | 43.83 | 43.83 | 54.13 | 42.65 | 42.65 |
| Movement LOS | D | A | A | D | A | A | D | D | D | D | D | D |
| d_A, Approach Delay [s/veh] | 5.74 | | | 12.30 | | | 42.97 | | | 49.27 | | |
| Approach LOS | A | | | B | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 16.84 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.271 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.68 | 34.68 | 34.68 | 34.68 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.616 | 2.532 | 1.994 | 2.056 |
| Crosswalk LOS | B | B | A | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 489 | 489 | 1111 | 1111 |
| d_b, Bicycle Delay [s] | 25.70 | 25.70 | 8.90 | 8.90 |
| l_b,int, Bicycle LOS Score for Intersection | 2.016 | 1.881 | 1.749 | 1.809 |
| Bicycle LOS | B | A | A | A |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 8: Randolph Avenue at Brea Mall**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 24.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.529 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Brea Mall | | | Brea Mall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 26 | 464 | 501 | 54 | 335 | 23 | 25 | 16 | 28 | 494 | 6 | 100 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 26 | 464 | 501 | 54 | 335 | 23 | 25 | 16 | 28 | 494 | 6 | 100 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 116 | 125 | 14 | 84 | 6 | 6 | 4 | 7 | 124 | 2 | 25 |
| Total Analysis Volume [veh/h] | 26 | 464 | 501 | 54 | 335 | 23 | 25 | 16 | 28 | 494 | 6 | 100 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 105 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Split | Split | Split | Split | Split | Split |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 1 | 6 | 0 | 5 | 2 | 0 | 0 | 8 | 0 | 0 | 4 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 10 | 28 | 0 | 11 | 29 | 0 | 0 | 30 | 0 | 0 | 36 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 17 | 0 | 0 | 18 | 0 | 0 | 19 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | | No | | | No | |
| Maximum Recall | No | No | | No | No | | | No | | | No | |
| Pedestrian Recall | No | No | | No | No | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | C | C | R | L | C |
|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 0.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 67 | 58 | 58 | 67 | 60 | 60 | 5 | 5 | 21 | 21 |
| g / C, Green / Cycle | 0.64 | 0.56 | 0.56 | 0.64 | 0.57 | 0.57 | 0.05 | 0.05 | 0.20 | 0.20 |
| (v / s)_i Volume / Saturation Flow Rate | 0.01 | 0.24 | 0.26 | 0.03 | 0.09 | 0.09 | 0.02 | 0.01 | 0.17 | 0.15 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 1900 | 1900 | 1800 | 1900 | 1800 | 1900 |
| c, Capacity [veh/h] | 1165 | 1055 | 1055 | 955 | 1084 | 1084 | 90 | 95 | 353 | 373 |
| d1, Uniform Delay [s] | 6.93 | 13.73 | 14.10 | 7.04 | 10.71 | 10.69 | 48.51 | 48.12 | 40.86 | 40.15 |
| k, delay calibration | 0.11 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.11 | 0.11 | 0.13 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.01 | 1.33 | 1.53 | 0.11 | 0.33 | 0.33 | 3.56 | 1.70 | 7.38 | 3.75 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.02 | 0.44 | 0.47 | 0.06 | 0.17 | 0.16 | 0.46 | 0.29 | 0.86 | 0.79 |
| d, Delay for Lane Group [s/veh] | 6.94 | 15.06 | 15.63 | 7.15 | 11.04 | 11.02 | 52.08 | 49.82 | 48.25 | 43.90 |
| Lane Group LOS | A | B | B | A | B | B | D | D | D | D |
| Critical Lane Group | No | No | Yes | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 0.20 | 6.57 | 7.30 | 0.45 | 2.02 | 1.99 | 1.13 | 0.75 | 8.29 | 7.56 |
| 50th-Percentile Queue Length [ft/ln] | 5.09 | 164.24 | 182.43 | 11.36 | 50.47 | 49.63 | 28.28 | 18.77 | 207.37 | 188.88 |
| 95th-Percentile Queue Length [veh/ln] | 0.37 | 10.77 | 11.73 | 0.82 | 3.63 | 3.57 | 2.04 | 1.35 | 13.02 | 12.06 |
| 95th-Percentile Queue Length [ft/ln] | 9.16 | 269.32 | 293.19 | 20.45 | 90.84 | 89.33 | 50.90 | 33.79 | 325.45 | 301.57 |

**Movement, Approach, & Intersection Results**

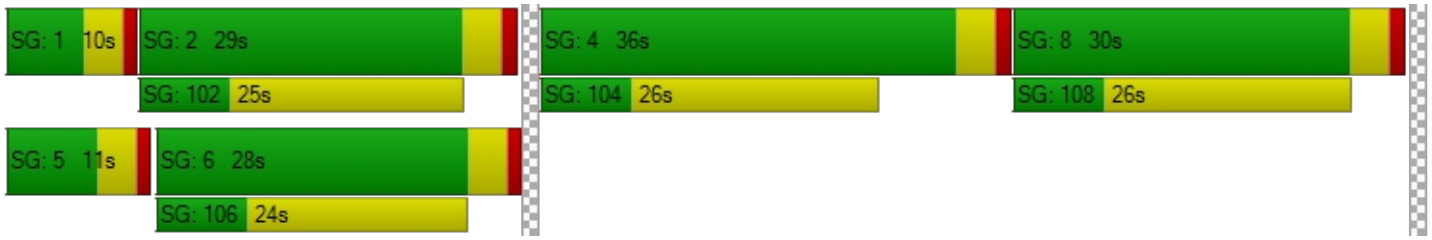
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 6.94 | 15.06 | 15.63 | 7.15 | 11.03 | 11.02 | 52.08 | 52.08 | 49.82 | 46.58 | 43.90 | 43.90 |
| Movement LOS | A | B | B | A | B | B | D | D | D | D | D | D |
| d_A, Approach Delay [s/veh] | 15.13 | | | 10.52 | | | 51.16 | | | 46.11 | | |
| Approach LOS | B | | | B | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 24.39 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.529 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 42.09 | 42.09 | 42.09 | 42.09 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.667 | 2.502 | 2.010 | 2.372 |
| Crosswalk LOS | B | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 457 | 476 | 495 | 609 |
| d_b, Bicycle Delay [s] | 31.26 | 30.49 | 29.73 | 25.39 |
| l_b,int, Bicycle LOS Score for Intersection | 2.377 | 1.900 | 1.673 | 2.550 |
| Bicycle LOS | B | A | A | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 9: Brea Mall South at State College Boulevard**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 32.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.833 |

**Intersection Setup**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Brea Mall South | | | Brea Mall South | | | State College Boulevard | | | State College Boulevard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 184 | 34 | 99 | 88 | 29 | 636 | 743 | 506 | 41 | 93 | 673 | 47 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 184 | 34 | 99 | 88 | 29 | 636 | 743 | 506 | 41 | 93 | 673 | 47 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 46 | 9 | 25 | 22 | 7 | 159 | 186 | 127 | 10 | 23 | 168 | 12 |
| Total Analysis Volume [veh/h] | 184 | 34 | 99 | 88 | 29 | 636 | 743 | 506 | 41 | 93 | 673 | 47 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 4 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 4,5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 6 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 30 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 37 | 0 | 0 | 14 | 14 | 37 | 31 | 0 | 38 | 32 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 21 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | No | No | No | | No | No | |
| Maximum Recall | | No | | | No | No | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | No | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | C | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 11 | 11 | 11 | 10 | 10 | 61 | 31 | 75 | 75 | 8 | 51 | 51 |
| g / C, Green / Cycle | 0.10 | 0.10 | 0.10 | 0.08 | 0.08 | 0.51 | 0.26 | 0.62 | 0.62 | 0.07 | 0.43 | 0.43 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.08 | 0.05 | 0.05 | 0.02 | 0.33 | 0.21 | 0.15 | 0.14 | 0.05 | 0.19 | 0.19 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 1800 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 1900 | 1900 |
| c, Capacity [veh/h] | 204 | 224 | 181 | 151 | 159 | 965 | 917 | 1180 | 1180 | 120 | 808 | 808 |
| d1, Uniform Delay [s] | 51.45 | 53.21 | 51.85 | 52.97 | 51.16 | 21.86 | 41.50 | 10.09 | 10.05 | 55.16 | 24.51 | 24.38 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.24 | 2.72 | 2.57 | 3.52 | 0.54 | 3.53 | 1.77 | 0.47 | 0.45 | 10.24 | 1.81 | 1.74 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.39 | 0.61 | 0.55 | 0.58 | 0.18 | 0.66 | 0.81 | 0.23 | 0.23 | 0.78 | 0.45 | 0.44 |
| d, Delay for Lane Group [s/veh] | 52.68 | 55.93 | 54.41 | 56.49 | 51.70 | 25.38 | 43.27 | 10.56 | 10.50 | 65.40 | 26.32 | 26.12 |
| Lane Group LOS | D | E | D | E | D | C | D | B | B | E | C | C |
| Critical Lane Group | No | Yes | No | No | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 2.37 | 4.23 | 2.98 | 2.71 | 0.84 | 13.89 | 10.48 | 3.31 | 3.22 | 3.11 | 7.73 | 7.51 |
| 50th-Percentile Queue Length [ft/ln] | 59.22 | 105.69 | 74.42 | 67.70 | 20.97 | 347.31 | 262.02 | 82.76 | 80.50 | 77.78 | 193.14 | 187.75 |
| 95th-Percentile Queue Length [veh/ln] | 4.26 | 7.60 | 5.36 | 4.87 | 1.51 | 20.00 | 15.79 | 5.96 | 5.80 | 5.60 | 12.28 | 12.00 |
| 95th-Percentile Queue Length [ft/ln] | 106.59 | 189.99 | 133.95 | 121.86 | 37.75 | 500.12 | 394.76 | 148.97 | 144.89 | 140.00 | 307.10 | 300.10 |

**Movement, Approach, & Intersection Results**

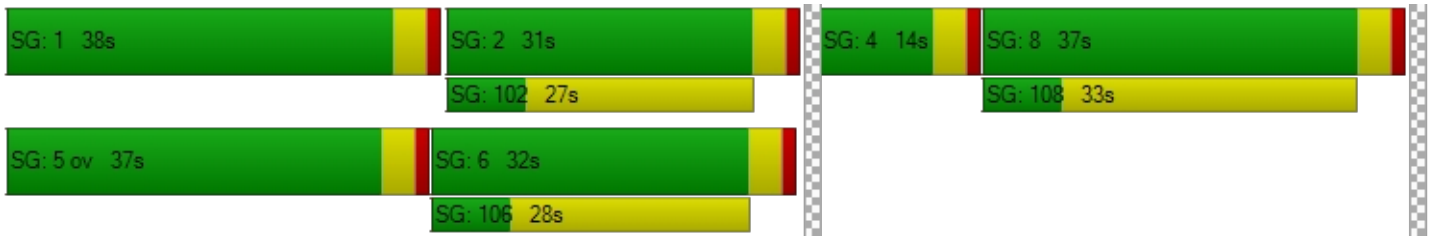
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 54.44 | 55.93 | 54.41 | 56.49 | 51.70 | 25.38 | 43.27 | 10.53 | 10.50 | 65.40 | 26.23 | 26.12 |
| Movement LOS | D | E | D | E | D | C | D | B | B | E | C | C |
| d_A, Approach Delay [s/veh] | 54.63 | | | 30.03 | | | 29.39 | | | 30.70 | | |
| Approach LOS | D | | | C | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 32.40 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.833 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 0.00 | 49.52 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.407 | 2.621 | 0.000 | 2.607 |
| Crosswalk LOS | B | B | F | B |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 550 | 167 | 450 | 467 |
| d_b, Bicycle Delay [s] | 31.55 | 50.43 | 36.05 | 35.28 |
| l_b,int, Bicycle LOS Score for Intersection | 2.083 | 2.181 | 2.624 | 2.230 |
| Bicycle LOS | B | B | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 10: Harbor Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 53.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.896 |

**Intersection Setup**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Harbor Boulevard | | | Harbor Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 719 | 989 | 282 | 248 | 896 | 315 | 371 | 1294 | 391 | 368 | 1407 | 236 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 719 | 989 | 282 | 248 | 896 | 315 | 371 | 1294 | 391 | 368 | 1407 | 236 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 180 | 247 | 71 | 62 | 224 | 79 | 93 | 324 | 98 | 92 | 352 | 59 |
| Total Analysis Volume [veh/h] | 719 | 989 | 282 | 248 | 896 | 315 | 371 | 1294 | 391 | 368 | 1407 | 236 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 26 | 52 | 0 | 11 | 37 | 0 | 17 | 42 | 0 | 15 | 40 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 31 | 0 | 0 | 28 | 0 | 0 | 31 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 22 | 39 | 39 | 7 | 24 | 24 | 13 | 47 | 47 | 11 | 45 | 45 |
| g / C, Green / Cycle | 0.18 | 0.33 | 0.33 | 0.06 | 0.20 | 0.20 | 0.11 | 0.39 | 0.39 | 0.09 | 0.37 | 0.37 |
| (v / s)_i Volume / Saturation Flow Rate | 0.21 | 0.17 | 0.15 | 0.07 | 0.16 | 0.17 | 0.11 | 0.30 | 0.29 | 0.11 | 0.25 | 0.12 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 643 | 1863 | 621 | 209 | 1157 | 386 | 383 | 1472 | 736 | 325 | 2114 | 705 |
| d1, Uniform Delay [s] | 49.03 | 32.93 | 31.96 | 56.47 | 45.28 | 45.74 | 53.30 | 32.23 | 31.55 | 54.49 | 31.56 | 27.14 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.16 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 58.53 | 0.24 | 0.52 | 94.03 | 1.14 | 6.34 | 15.30 | 4.07 | 6.50 | 68.70 | 1.68 | 1.28 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 1.12 | 0.53 | 0.45 | 1.19 | 0.77 | 0.82 | 0.97 | 0.78 | 0.74 | 1.13 | 0.67 | 0.33 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 107.56 | 33.17 | 32.48 | 150.51 | 46.42 | 52.08 | 68.59 | 36.30 | 38.05 | 123.19 | 33.24 | 28.42 |
| Lane Group LOS | F | C | C | F | D | D | E | D | D | F | C | C |
| Critical Lane Group | Yes | No | No | No | No | Yes | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 14.81 | 7.84 | 6.56 | 5.90 | 8.52 | 9.63 | 6.38 | 15.14 | 14.63 | 8.00 | 11.58 | 5.12 |
| 50th-Percentile Queue Length [ft/ln] | 370.29 | 196.00 | 164.11 | 147.56 | 213.05 | 240.73 | 159.54 | 378.56 | 365.83 | 200.07 | 289.56 | 128.02 |
| 95th-Percentile Queue Length [veh/ln] | 22.33 | 12.43 | 10.77 | 10.37 | 13.31 | 14.72 | 10.52 | 21.52 | 20.91 | 13.22 | 17.16 | 8.83 |
| 95th-Percentile Queue Length [ft/ln] | 558.25 | 310.79 | 269.16 | 259.31 | 332.74 | 367.95 | 263.11 | 538.10 | 522.67 | 330.43 | 429.09 | 220.80 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 107.56 | 33.17 | 32.48 | 150.51 | 46.42 | 52.08 | 68.59 | 36.51 | 38.05 | 123.19 | 33.24 | 28.42 |
| Movement LOS | F | C | C | F | D | D | E | D | D | F | C | C |
| d_A, Approach Delay [s/veh] | 59.95 | | | 65.33 | | | 42.59 | | | 49.13 | | |
| Approach LOS | E | | | E | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 53.35 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.896 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.258 | 3.194 | 3.287 | 3.278 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 800 | 550 | 633 | 600 |
| d_b, Bicycle Delay [s] | 21.63 | 31.57 | 28.04 | 29.43 |
| l_b,int, Bicycle LOS Score for Intersection | 2.654 | 2.362 | 2.690 | 2.666 |
| Bicycle LOS | B | B | B | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 11: Puente Street at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 13.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.481 |

**Intersection Setup**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Puente Street | | | Puente Street | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 28 | 33 | 109 | 186 | 46 | 134 | 86 | 1433 | 39 | 88 | 1484 | 248 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 28 | 33 | 109 | 186 | 46 | 134 | 86 | 1433 | 39 | 88 | 1484 | 248 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 7 | 8 | 27 | 47 | 12 | 34 | 22 | 358 | 10 | 22 | 371 | 62 |
| Total Analysis Volume [veh/h] | 28 | 33 | 109 | 186 | 46 | 134 | 86 | 1433 | 39 | 88 | 1484 | 248 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 38 | 0 | 0 | 38 | 0 | 18 | 32 | 0 | 20 | 34 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 27 | 0 | 0 | 23 | 0 | 0 | 17 | 0 | 0 | 23 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 12 | 12 | 12 | 12 | 12 | 12 | 6 | 60 | 60 | 6 | 61 | 61 |
| g / C, Green / Cycle | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.06 | 0.67 | 0.67 | 0.06 | 0.67 | 0.67 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.02 | 0.06 | 0.10 | 0.01 | 0.07 | 0.05 | 0.26 | 0.26 | 0.05 | 0.26 | 0.13 |
| s, saturation flow rate [veh/h] | 1800 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 265 | 249 | 249 | 256 | 498 | 249 | 115 | 2547 | 1274 | 118 | 3829 | 1276 |
| d1, Uniform Delay [s] | 34.54 | 34.61 | 36.08 | 37.93 | 34.42 | 36.59 | 41.46 | 6.57 | 6.66 | 41.37 | 6.56 | 5.58 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.17 | 0.24 | 1.21 | 3.89 | 0.08 | 1.80 | 9.30 | 0.43 | 0.92 | 9.09 | 0.30 | 0.34 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.11 | 0.13 | 0.44 | 0.73 | 0.09 | 0.54 | 0.75 | 0.38 | 0.39 | 0.75 | 0.39 | 0.19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 34.72 | 34.85 | 37.28 | 41.81 | 34.50 | 38.39 | 50.75 | 7.01 | 7.57 | 50.47 | 6.86 | 5.92 |
| Lane Group LOS | C | C | D | D | C | D | D | A | A | D | A | A |
| Critical Lane Group | No | No | No | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.55 | 0.65 | 2.26 | 4.19 | 0.44 | 2.84 | 2.15 | 3.62 | 3.96 | 2.20 | 3.64 | 1.63 |
| 50th-Percentile Queue Length [ft/ln] | 13.73 | 16.25 | 56.62 | 104.74 | 11.12 | 71.10 | 53.83 | 90.52 | 99.07 | 54.89 | 91.07 | 40.73 |
| 95th-Percentile Queue Length [veh/ln] | 0.99 | 1.17 | 4.08 | 7.54 | 0.80 | 5.12 | 3.88 | 6.52 | 7.13 | 3.95 | 6.56 | 2.93 |
| 95th-Percentile Queue Length [ft/ln] | 24.72 | 29.25 | 101.91 | 188.53 | 20.01 | 127.98 | 96.89 | 162.93 | 178.33 | 98.80 | 163.93 | 73.31 |

**Movement, Approach, & Intersection Results**

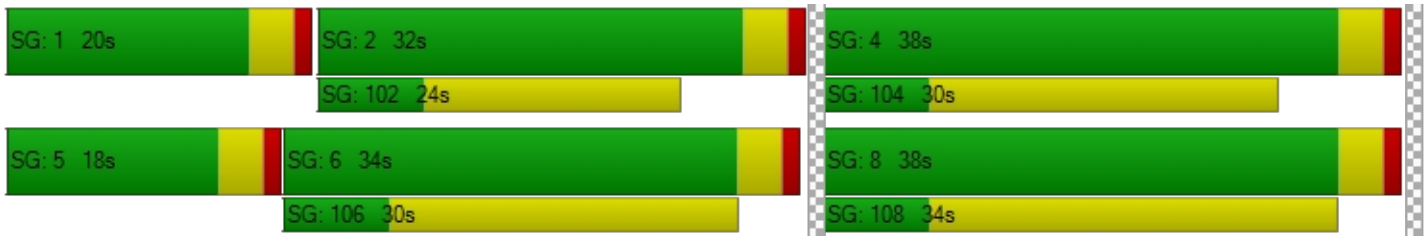
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 34.72 | 34.85 | 37.28 | 41.81 | 34.50 | 38.39 | 50.75 | 7.19 | 7.57 | 50.47 | 6.86 | 5.92 |
| Movement LOS | C | C | D | D | C | D | D | A | A | D | A | A |
| d_A, Approach Delay [s/veh] | 36.39 | | | 39.64 | | | 9.60 | | | 8.84 | | |
| Approach LOS | D | | | D | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 13.22 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |
| Intersection V/C | 0.481 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.70 | 34.70 | 34.70 | 34.70 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.366 | 2.442 | 3.080 | 3.422 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 755 | 755 | 622 | 666 |
| d_b, Bicycle Delay [s] | 17.44 | 17.44 | 21.38 | 20.02 |
| l_b,int, Bicycle LOS Score for Intersection | 1.840 | 1.862 | 2.417 | 2.561 |
| Bicycle LOS | A | A | B | B |

## Sequence

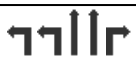
| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 12: Brea Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 45.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.874 |

**Intersection Setup**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Brea Boulevard | | | Brea Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 451 | 669 | 307 | 490 | 984 | 274 | 296 | 1462 | 302 | 396 | 1512 | 435 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 451 | 669 | 307 | 490 | 984 | 274 | 296 | 1462 | 302 | 396 | 1512 | 435 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 113 | 167 | 77 | 123 | 246 | 69 | 74 | 366 | 76 | 99 | 378 | 109 |
| Total Analysis Volume [veh/h] | 451 | 669 | 307 | 490 | 984 | 274 | 296 | 1462 | 302 | 396 | 1512 | 435 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 20 | 41 | 0 | 21 | 42 | 0 | 15 | 41 | 0 | 17 | 43 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | R | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 16 | 33 | 33 | 17 | 34 | 34 | 11 | 41 | 41 | 13 | 43 | 43 |
| g / C, Green / Cycle | 0.13 | 0.28 | 0.28 | 0.14 | 0.29 | 0.29 | 0.09 | 0.34 | 0.34 | 0.11 | 0.36 | 0.36 |
| (v / s)_i Volume / Saturation Flow Rate | 0.13 | 0.12 | 0.16 | 0.14 | 0.26 | 0.14 | 0.08 | 0.26 | 0.16 | 0.11 | 0.27 | 0.23 |
| s, saturation flow rate [veh/h] | 3500 | 5700 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 469 | 1574 | 525 | 498 | 1081 | 540 | 325 | 1932 | 644 | 383 | 2026 | 675 |
| d1, Uniform Delay [s] | 51.69 | 35.65 | 37.53 | 51.37 | 41.50 | 35.94 | 54.00 | 35.30 | 31.21 | 53.50 | 33.96 | 32.36 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 12.07 | 0.18 | 1.04 | 15.22 | 3.38 | 0.74 | 9.86 | 2.82 | 2.44 | 30.99 | 2.56 | 4.69 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.96 | 0.43 | 0.59 | 0.98 | 0.91 | 0.51 | 0.91 | 0.76 | 0.47 | 1.03 | 0.75 | 0.64 |
| d, Delay for Lane Group [s/veh] | 63.77 | 35.84 | 38.58 | 66.59 | 44.88 | 36.68 | 63.86 | 38.13 | 33.65 | 84.48 | 36.51 | 37.04 |
| Lane Group LOS | E | D | D | E | D | D | E | D | C | F | D | D |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 7.52 | 5.39 | 7.93 | 8.38 | 14.42 | 6.82 | 4.87 | 13.06 | 7.32 | 7.41 | 13.24 | 11.38 |
| 50th-Percentile Queue Length [ft/ln] | 187.97 | 134.79 | 198.18 | 209.58 | 360.53 | 170.52 | 121.83 | 326.56 | 182.90 | 185.29 | 331.03 | 284.38 |
| 95th-Percentile Queue Length [veh/ln] | 12.02 | 9.20 | 12.54 | 13.13 | 20.65 | 11.10 | 8.49 | 18.99 | 11.75 | 12.04 | 19.21 | 16.91 |
| 95th-Percentile Queue Length [ft/ln] | 300.40 | 229.99 | 313.62 | 328.30 | 516.22 | 277.60 | 212.34 | 474.75 | 293.80 | 300.96 | 480.23 | 422.66 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 63.77 | 35.84 | 38.58 | 66.59 | 44.88 | 36.68 | 63.86 | 38.13 | 33.65 | 84.48 | 36.51 | 37.04 |
| Movement LOS | E | D | D | E | D | D | E | D | C | F | D | D |
| d_A, Approach Delay [s/veh] | 45.25 | | | 49.68 | | | 41.17 | | | 44.72 | | |
| Approach LOS | D | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 45.00 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.874 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.118 | 3.123 | 3.329 | 3.362 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 616 | 633 | 616 | 650 |
| d_b, Bicycle Delay [s] | 28.73 | 28.04 | 28.73 | 27.37 |
| l_b,int, Bicycle LOS Score for Intersection | 2.344 | 3.002 | 2.693 | 2.848 |
| Bicycle LOS | B | C | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 13: Randolph Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 47.2 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.927 |

**Intersection Setup**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | No | | |

**Volumes**

| Name | Randolph Avenue | | | Randolph Avenue | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 107 | 49 | 209 | 467 | 90 | 367 | 360 | 1684 | 68 | 151 | 1996 | 520 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 107 | 49 | 209 | 467 | 90 | 367 | 360 | 1684 | 68 | 151 | 1996 | 520 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 27 | 12 | 52 | 117 | 23 | 92 | 90 | 421 | 17 | 38 | 499 | 130 |
| Total Analysis Volume [veh/h] | 107 | 49 | 209 | 467 | 90 | 367 | 360 | 1684 | 68 | 151 | 1996 | 520 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 17 | 0 | 0 | 40 | 0 | 17 | 48 | 0 | 15 | 46 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 28 | 0 | 0 | 29 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 15 | 15 | 15 | 32 | 32 | 13 | 46 | 46 | 11 | 44 | 44 |
| g / C, Green / Cycle | 0.13 | 0.13 | 0.13 | 0.26 | 0.26 | 0.11 | 0.38 | 0.38 | 0.09 | 0.37 | 0.37 |
| (v / s)_i Volume / Saturation Flow Rate | 0.06 | 0.03 | 0.11 | 0.13 | 0.24 | 0.10 | 0.30 | 0.31 | 0.08 | 0.35 | 0.27 |
| s, saturation flow rate [veh/h] | 1800 | 1800 | 1900 | 3500 | 1900 | 3500 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 229 | 229 | 241 | 925 | 502 | 381 | 1456 | 728 | 166 | 2090 | 697 |
| d1, Uniform Delay [s] | 48.64 | 47.02 | 51.40 | 37.51 | 42.80 | 53.14 | 32.81 | 33.30 | 54.00 | 37.06 | 33.15 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.31 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.49 | 0.46 | 9.03 | 0.43 | 16.22 | 11.87 | 4.52 | 10.01 | 16.70 | 11.62 | 7.16 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.47 | 0.21 | 0.87 | 0.51 | 0.91 | 0.95 | 0.79 | 0.82 | 0.91 | 0.96 | 0.75 |
| d, Delay for Lane Group [s/veh] | 50.12 | 47.49 | 60.43 | 37.94 | 59.01 | 65.02 | 37.32 | 43.31 | 70.69 | 48.68 | 40.31 |
| Lane Group LOS | D | D | E | D | E | E | D | D | E | D | D |
| Critical Lane Group | No | No | Yes | No | Yes | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 3.08 | 1.35 | 6.76 | 5.89 | 15.29 | 6.01 | 15.57 | 17.40 | 5.28 | 20.90 | 14.43 |
| 50th-Percentile Queue Length [ft/ln] | 76.95 | 33.76 | 169.11 | 147.25 | 382.28 | 150.32 | 389.15 | 435.00 | 132.12 | 522.47 | 360.65 |
| 95th-Percentile Queue Length [veh/ln] | 5.54 | 2.43 | 11.03 | 9.87 | 21.70 | 10.03 | 22.04 | 24.24 | 9.06 | 28.40 | 20.65 |
| 95th-Percentile Queue Length [ft/ln] | 138.51 | 60.77 | 275.75 | 246.75 | 542.60 | 250.85 | 550.92 | 606.02 | 226.38 | 709.90 | 516.37 |

**Movement, Approach, & Intersection Results**

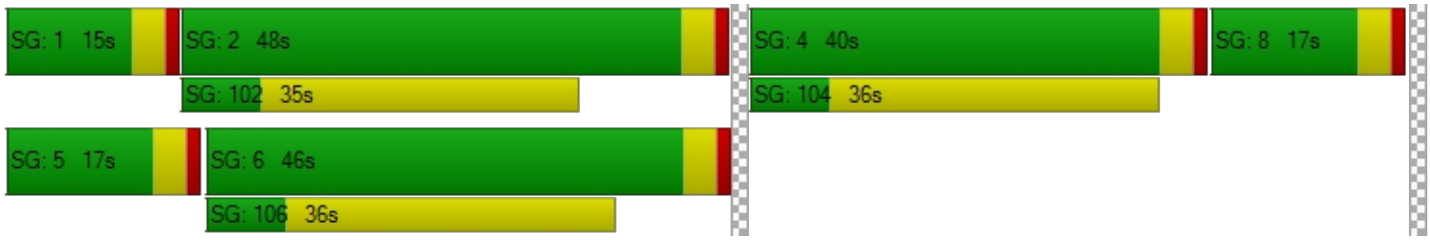
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 50.12 | 47.49 | 60.43 | 37.94 | 59.01 | 59.01 | 65.02 | 39.20 | 43.31 | 70.69 | 48.68 | 40.31 |
| Movement LOS | D | D | E | D | E | E | E | D | D | E | D | D |
| d_A, Approach Delay [s/veh] | 55.67 | | | 48.36 | | | 43.74 | | | 48.29 | | |
| Approach LOS | E | | | D | | | D | | | D | | |
| d_I, Intersection Delay [s/veh] | 47.16 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.927 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.52 | 49.52 | 49.52 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.309 | 2.675 | 3.298 | 0.000 |
| Crosswalk LOS | B | B | C | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 217 | 600 | 733 | 700 |
| d_b, Bicycle Delay [s] | 47.72 | 29.41 | 24.08 | 25.36 |
| l_b,int, Bicycle LOS Score for Intersection | 1.861 | 3.084 | 2.721 | 3.026 |
| Bicycle LOS | A | C | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 148.1 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | F |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.408 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 331 | 665 | 780 | 677 | 464 | 195 | 146 | 1791 | 244 | 699 | 2208 | 1173 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 331 | 665 | 780 | 677 | 464 | 195 | 146 | 1791 | 244 | 699 | 2208 | 1173 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 83 | 166 | 195 | 169 | 116 | 49 | 37 | 448 | 61 | 175 | 552 | 293 |
| Total Analysis Volume [veh/h] | 331 | 665 | 780 | 677 | 464 | 195 | 146 | 1791 | 244 | 699 | 2208 | 1173 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 29 | 41 | 0 | 27 | 39 | 0 | 10 | 34 | 0 | 18 | 42 | 42 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 23 | 0 | 0 | 23 | 23 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 14 | 37 | 37 | 23 | 46 | 46 | 6 | 30 | 30 | 14 | 38 | 65 |
| g / C, Green / Cycle | 0.12 | 0.31 | 0.31 | 0.19 | 0.38 | 0.38 | 0.05 | 0.25 | 0.25 | 0.12 | 0.32 | 0.54 |
| (v / s)_i Volume / Saturation Flow Rate | 0.09 | 0.18 | 0.41 | 0.34 | 0.18 | 0.17 | 0.04 | 0.27 | 0.27 | 0.20 | 0.39 | 0.62 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 2000 | 1900 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 405 | 1166 | 583 | 383 | 728 | 728 | 176 | 1431 | 477 | 409 | 1811 | 1031 |
| d1, Uniform Delay [s] | 51.85 | 34.94 | 41.59 | 48.51 | 27.90 | 27.38 | 56.48 | 44.94 | 44.94 | 53.00 | 40.95 | 27.45 |
| k, delay calibration | 0.11 | 0.11 | 0.50 | 0.21 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.12 | 0.44 | 163.23 | 349.04 | 0.48 | 0.41 | 9.46 | 42.01 | 64.52 | 321.09 | 104.02 | 73.99 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.82 | 0.57 | 1.34 | 1.77 | 0.47 | 0.43 | 0.83 | 1.06 | 1.08 | 1.71 | 1.22 | 1.14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 55.96 | 35.38 | 204.83 | 397.55 | 28.38 | 27.78 | 65.94 | 86.96 | 109.47 | 374.09 | 144.97 | 101.44 |
| Lane Group LOS | E | D | F | F | C | C | E | F | F | F | F | F |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 5.09 | 8.21 | 43.44 | 24.30 | 7.52 | 6.74 | 2.42 | 19.65 | 22.63 | 24.40 | 35.02 | 49.10 |
| 50th-Percentile Queue Length [ft/ln] | 127.35 | 205.31 | 1086.03 | 607.43 | 188.06 | 168.56 | 60.60 | 491.21 | 565.79 | 609.96 | 875.51 | 1227.49 |
| 95th-Percentile Queue Length [veh/ln] | 8.80 | 12.91 | 64.01 | 39.84 | 12.02 | 11.00 | 4.36 | 27.89 | 31.87 | 38.65 | 50.48 | 67.11 |
| 95th-Percentile Queue Length [ft/ln] | 219.89 | 322.81 | 1600.31 | 996.01 | 300.51 | 275.02 | 109.09 | 697.31 | 796.73 | 966.17 | 1262.03 | 1677.80 |

**Movement, Approach, & Intersection Results**

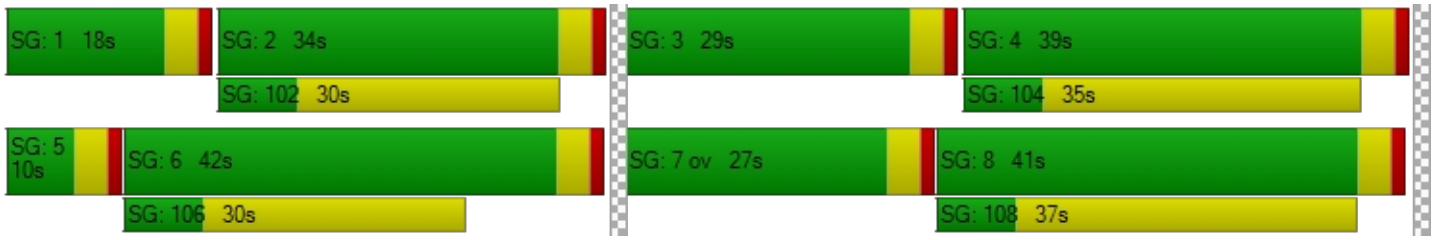
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 55.96 | 35.38 | 204.83 | 397.55 | 28.22 | 27.78 | 65.94 | 90.37 | 109.47 | 374.09 | 144.97 | 101.44 |
| Movement LOS | E | D | F | F | C | C | E | F | F | F | F | F |
| d_A, Approach Delay [s/veh] | 113.64 | | | 215.31 | | | 90.87 | | | 171.71 | | |
| Approach LOS | F | | | F | | | F | | | F | | |
| d_I, Intersection Delay [s/veh] | 148.11 | | | | | | | | | | | |
| Intersection LOS | F | | | | | | | | | | | |
| Intersection V/C | 1.408 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.51 | 49.51 | 49.51 | 49.51 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.051 | 3.006 | 3.395 | 3.695 |
| Crosswalk LOS | C | C | C | D |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 617 | 583 | 500 | 633 |
| d_b, Bicycle Delay [s] | 28.71 | 30.11 | 33.76 | 28.02 |
| l_b,int, Bicycle LOS Score for Intersection | 3.025 | 2.662 | 2.459 | 3.804 |
| Bicycle LOS | C | B | B | D |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 15: SR-57 SB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 20.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.845 |

**Intersection Setup**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | | | | No | | | No | | | No | | |
| Crosswalk | No | | | Yes | | | No | | | No | | |

**Volumes**

| Name | | | | SR-57 SB Ramps | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 581 | 0 | 836 | 0 | 2386 | 1272 | 0 | 2891 | 367 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 581 | 0 | 836 | 0 | 2386 | 1272 | 0 | 2891 | 367 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 145 | 0 | 209 | 0 | 597 | 318 | 0 | 723 | 92 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 581 | 0 | 836 | 0 | 2386 | 1272 | 0 | 2891 | 367 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_di, Inbound Pedestrian Volume crossing m | | 0 | | | 0 | | | 0 | | | 0 | |
| v_co, Outbound Pedestrian Volume crossing | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ci, Inbound Pedestrian Volume crossing mi | | 0 | | | 0 | | | 0 | | | 0 | |
| v_ab, Corner Pedestrian Volume [ped/h] | | 0 | | | 0 | | | 0 | | | 0 | |
| Bicycle Volume [bicycles/h] | | 0 | | | 0 | | | 0 | | | 0 | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 100 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 8.00 |

**Phasing & Timing**

| Control Type | Permiss | Permiss | Permiss | Split | Permiss | Split | Permiss | Permiss | Unsigna | Permiss | Permiss | Unsigna |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | - | - | - | - | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 56 | 0 | 0 | 0 | 44 | 0 | 0 | 44 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | | | No | | | | No | | | No | |
| Maximum Recall | | | | No | | | | No | | | No | |
| Pedestrian Recall | | | | No | | | | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | | L | C | R | C | C |
|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 32 | 32 | 32 | 60 | 60 |
| g / C, Green / Cycle | | 0.32 | 0.32 | 0.32 | 0.60 | 0.60 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.27 | 0.27 | 0.25 | 0.42 | 0.51 |
| s, saturation flow rate [veh/h] | | 1750 | 1750 | 1900 | 5700 | 5700 |
| c, Capacity [veh/h] | | 553 | 553 | 601 | 3442 | 3442 |
| d1, Uniform Delay [s] | | 32.00 | 32.00 | 31.09 | 13.48 | 15.90 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 3.88 | 3.88 | 2.33 | 1.17 | 2.65 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.85 | 0.85 | 0.79 | 0.69 | 0.84 |
| d, Delay for Lane Group [s/veh] | | 35.88 | 35.88 | 33.42 | 14.65 | 18.55 |
| Lane Group LOS | | D | D | C | B | B |
| Critical Lane Group | | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | | 11.01 | 11.01 | 10.50 | 11.49 | 16.73 |
| 50th-Percentile Queue Length [ft/ln] | | 275.17 | 275.17 | 262.59 | 287.13 | 418.19 |
| 95th-Percentile Queue Length [veh/ln] | | 16.45 | 16.45 | 15.82 | 17.04 | 23.44 |
| 95th-Percentile Queue Length [ft/ln] | | 411.19 | 411.19 | 395.47 | 426.08 | 585.88 |

**Movement, Approach, & Intersection Results**

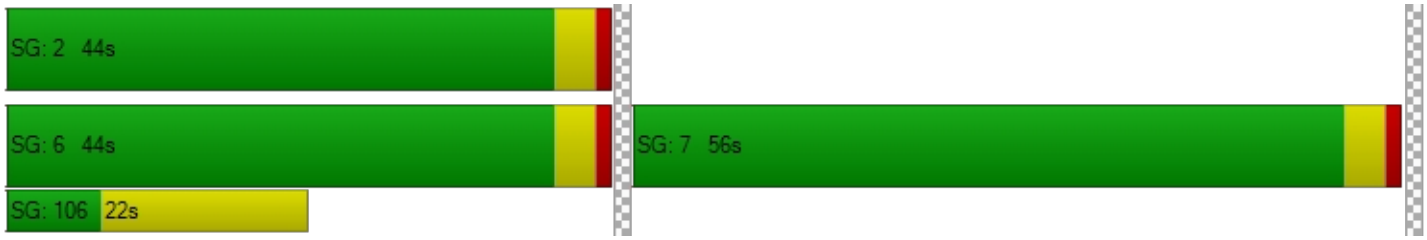
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 35.88 | 0.00 | 34.49 | 0.00 | 14.65 | 0.00 | 0.00 | 18.55 | 0.00 |
| Movement LOS | | | | D | | C | | B | | | B | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 35.06 | | | 14.65 | | | 18.55 | | |
| Approach LOS | A | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 20.65 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.845 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 0.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 0.00 | 39.57 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 0.000 | 2.481 | 0.000 | 0.000 |
| Crosswalk LOS | F | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 1041 | 801 | 801 |
| d_b, Bicycle Delay [s] | 49.97 | 11.50 | 17.97 | 17.97 |
| l_b,int, Bicycle LOS Score for Intersection | 4.132 | 3.898 | 2.872 | 3.150 |
| Bicycle LOS | D | D | C | C |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 16: SR-57 NB Ramps at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 42.6 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.952 |

**Intersection Setup**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | No | | |

**Volumes**

| Name | SR-57 NB Ramps | | | Shopping Center | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 1581 | 117 | 638 | 0 | 0 | 372 | 389 | 2123 | 702 | 0 | 2238 | 60 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1581 | 117 | 638 | 0 | 0 | 372 | 389 | 2123 | 702 | 0 | 2238 | 60 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 395 | 29 | 160 | 0 | 0 | 93 | 97 | 531 | 176 | 0 | 560 | 15 |
| Total Analysis Volume [veh/h] | 1581 | 117 | 638 | 0 | 0 | 372 | 389 | 2123 | 702 | 0 | 2238 | 60 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Permiss | Overlap | Protecte | Permiss | Unsigna | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 0 | 5 | 5 | 2 | 0 | 0 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | 5 | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 0 | 6 | 6 | 6 | 0 | 0 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 47 | 0 | 0 | 0 | 31 | 31 | 73 | 0 | 0 | 42 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 19 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | | No | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | | No | No | No | | | No | |
| Maximum Recall | | No | | | | No | No | No | | | No | |
| Pedestrian Recall | | No | | | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 43 | 43 | 43 | 27 | 27 | 69 | 38 | 38 |
| g / C, Green / Cycle | 0.36 | 0.36 | 0.36 | 0.23 | 0.23 | 0.58 | 0.32 | 0.32 |
| (v / s)_i Volume / Saturation Flow Rate | 0.33 | 0.34 | 0.31 | 0.10 | 0.22 | 0.37 | 0.30 | 0.30 |
| s, saturation flow rate [veh/h] | 3500 | 1750 | 1900 | 3800 | 1800 | 5700 | 5700 | 1900 |
| c, Capacity [veh/h] | 1244 | 622 | 675 | 855 | 405 | 3293 | 1820 | 607 |
| d1, Uniform Delay [s] | 37.11 | 37.66 | 36.20 | 39.92 | 45.94 | 17.03 | 39.82 | 39.82 |
| k, delay calibration | 0.11 | 0.42 | 0.37 | 0.11 | 0.35 | 0.50 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 3.49 | 23.44 | 11.58 | 0.35 | 28.83 | 0.99 | 11.79 | 25.54 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.92 | 0.95 | 0.88 | 0.43 | 0.96 | 0.64 | 0.95 | 0.95 |
| d, Delay for Lane Group [s/veh] | 40.60 | 61.10 | 47.78 | 40.27 | 74.77 | 18.02 | 51.61 | 65.36 |
| Lane Group LOS | D | E | D | D | E | B | D | E |
| Critical Lane Group | No | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 16.54 | 20.70 | 18.18 | 4.77 | 14.63 | 12.92 | 18.29 | 20.61 |
| 50th-Percentile Queue Length [ft/ln] | 413.43 | 517.61 | 454.50 | 119.29 | 365.72 | 323.00 | 457.33 | 515.28 |
| 95th-Percentile Queue Length [veh/ln] | 23.21 | 28.17 | 25.17 | 8.35 | 20.90 | 18.81 | 25.31 | 28.06 |
| 95th-Percentile Queue Length [ft/ln] | 580.16 | 704.17 | 629.31 | 208.85 | 522.53 | 470.37 | 632.69 | 701.41 |

**Movement, Approach, & Intersection Results**

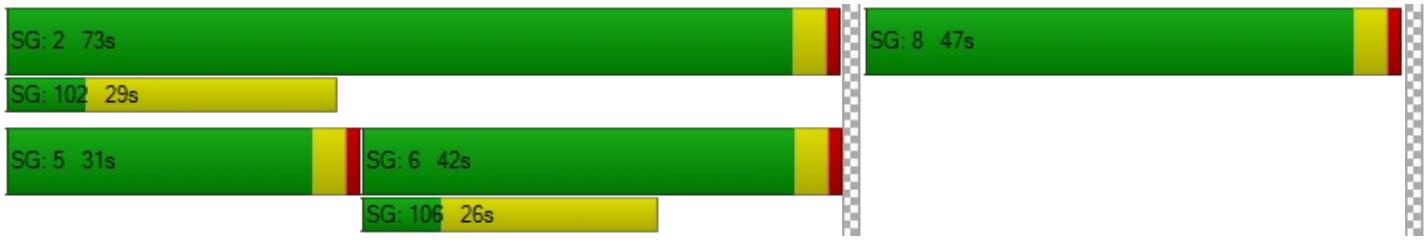
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 46.07 | 61.10 | 48.91 | 0.00 | 0.00 | 40.27 | 74.77 | 18.02 | 0.00 | 0.00 | 54.77 | 65.36 |
| Movement LOS | D | E | D | | | D | E | B | | | D | E |
| d_A, Approach Delay [s/veh] | 47.62 | | | 40.27 | | | 26.81 | | | 55.05 | | |
| Approach LOS | D | | | D | | | C | | | E | | |
| d_I, Intersection Delay [s/veh] | 42.57 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.952 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 0.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.49 | 49.49 | 0.00 | 0.00 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.769 | 2.259 | 0.000 | 0.000 |
| Crosswalk LOS | C | B | F | F |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 717 | 450 | 1150 | 634 |
| d_b, Bicycle Delay [s] | 24.69 | 36.02 | 10.83 | 28.00 |
| l_b,int, Bicycle LOS Score for Intersection | 5.414 | 1.560 | 2.941 | 2.508 |
| Bicycle LOS | F | A | C | B |

## Sequence

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 17: Associated Road at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 35.9 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.842 |

**Intersection Setup**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | Associated Road | | | Associated Road | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 262 | 198 | 141 | 320 | 254 | 204 | 256 | 2033 | 270 | 191 | 1850 | 227 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 262 | 198 | 141 | 320 | 254 | 204 | 256 | 2033 | 270 | 191 | 1850 | 227 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 66 | 50 | 35 | 80 | 64 | 51 | 64 | 508 | 68 | 48 | 463 | 57 |
| Total Analysis Volume [veh/h] | 262 | 198 | 141 | 320 | 254 | 204 | 256 | 2033 | 270 | 191 | 1850 | 227 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 115 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 15 | 39 | 0 | 16 | 40 | 0 | 24 | 42 | 0 | 18 | 36 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 28 | 0 | 0 | 29 | 0 | 0 | 26 | 0 | 0 | 25 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | C | L | C | R | L | C | C | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 11 | 17 | 17 | 12 | 18 | 18 | 18 | 56 | 56 | 14 | 52 | 52 |
| g / C, Green / Cycle | 0.09 | 0.14 | 0.14 | 0.10 | 0.16 | 0.16 | 0.16 | 0.49 | 0.49 | 0.12 | 0.45 | 0.45 |
| (v / s)_i Volume / Saturation Flow Rate | 0.07 | 0.09 | 0.08 | 0.09 | 0.13 | 0.11 | 0.14 | 0.40 | 0.41 | 0.11 | 0.27 | 0.28 |
| s, saturation flow rate [veh/h] | 3500 | 1900 | 1900 | 3500 | 1900 | 1900 | 1800 | 3800 | 1900 | 1800 | 5700 | 1900 |
| c, Capacity [veh/h] | 322 | 274 | 274 | 367 | 299 | 299 | 285 | 1861 | 931 | 220 | 2583 | 861 |
| d1, Uniform Delay [s] | 51.29 | 46.54 | 45.97 | 50.74 | 47.17 | 45.78 | 47.50 | 25.00 | 25.40 | 49.63 | 23.62 | 23.85 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.12 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.01 | 2.67 | 1.93 | 6.47 | 6.70 | 2.75 | 10.49 | 4.15 | 8.90 | 10.12 | 1.04 | 3.27 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.81 | 0.66 | 0.58 | 0.87 | 0.85 | 0.68 | 0.90 | 0.82 | 0.84 | 0.87 | 0.60 | 0.61 |
| d, Delay for Lane Group [s/veh] | 56.29 | 49.21 | 47.91 | 57.22 | 53.87 | 48.52 | 57.98 | 29.15 | 34.30 | 59.74 | 24.65 | 27.12 |
| Lane Group LOS | E | D | D | E | D | D | E | C | C | E | C | C |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 3.93 | 5.07 | 4.39 | 4.86 | 7.61 | 5.72 | 8.00 | 18.11 | 20.01 | 6.00 | 10.56 | 11.47 |
| 50th-Percentile Queue Length [ft/ln] | 98.14 | 126.80 | 109.73 | 121.52 | 190.20 | 143.11 | 199.95 | 452.66 | 500.21 | 149.94 | 264.11 | 286.70 |
| 95th-Percentile Queue Length [veh/ln] | 7.07 | 8.77 | 7.83 | 8.48 | 12.13 | 9.65 | 12.64 | 25.09 | 27.34 | 10.01 | 15.89 | 17.02 |
| 95th-Percentile Queue Length [ft/ln] | 176.65 | 219.13 | 195.63 | 211.91 | 303.29 | 241.21 | 315.90 | 627.13 | 683.61 | 250.35 | 397.37 | 425.55 |

**Movement, Approach, & Intersection Results**

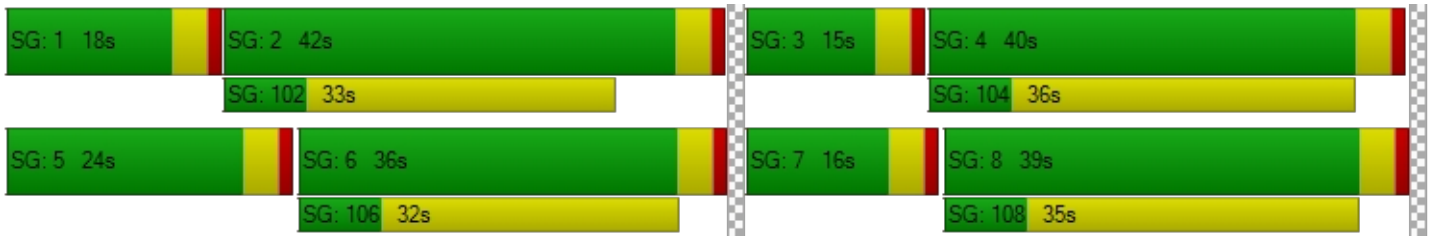
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 56.29 | 49.09 | 47.91 | 57.22 | 53.87 | 48.52 | 57.98 | 30.44 | 34.30 | 59.74 | 25.06 | 27.12 |
| Movement LOS | E | D | D | E | D | D | E | C | C | E | C | C |
| d_A, Approach Delay [s/veh] | 51.95 | | | 53.84 | | | 33.60 | | | 28.18 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 35.94 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.842 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 47.05 | 47.05 | 47.05 | 47.05 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.568 | 2.702 | 3.331 | 3.318 |
| Crosswalk LOS | B | B | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 608 | 626 | 661 | 556 |
| d_b, Bicycle Delay [s] | 27.84 | 27.15 | 25.80 | 29.97 |
| l_b,int, Bicycle LOS Score for Intersection | 2.055 | 2.843 | 2.967 | 2.495 |
| Bicycle LOS | B | C | C | B |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



**Intersection Level Of Service Report**
**Intersection 18: Castlegate Lane/Placentia Avenue at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 23.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.811 |

**Intersection Setup**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | No | | | Yes | | |

**Volumes**

| Name | Placentia Avenue | | | Castlegate Lane | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 211 | 18 | 276 | 28 | 12 | 13 | 26 | 2161 | 327 | 228 | 2180 | 50 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 211 | 18 | 276 | 28 | 12 | 13 | 26 | 2161 | 327 | 228 | 2180 | 50 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 53 | 5 | 69 | 7 | 3 | 3 | 7 | 540 | 82 | 57 | 545 | 13 |
| Total Analysis Volume [veh/h] | 211 | 18 | 276 | 28 | 12 | 13 | 26 | 2161 | 327 | 228 | 2180 | 50 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 90 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 0 | 8 | 0 | 0 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 6 | 0 | 0 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 26 | 0 | 0 | 10 | 0 | 10 | 32 | 0 | 22 | 44 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 |
| Pedestrian Clearance [s] | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 14 | 0 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | | No | | No | No | | No | No | |
| Maximum Recall | | No | | | No | | No | No | | No | No | |
| Pedestrian Recall | | No | | | No | | No | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | R | L | C | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 16 | 16 | 16 | 4 | 4 | 3 | 41 | 41 | 13 | 51 | 51 |
| g / C, Green / Cycle | 0.17 | 0.17 | 0.17 | 0.05 | 0.05 | 0.03 | 0.45 | 0.45 | 0.15 | 0.57 | 0.57 |
| (v / s)_i Volume / Saturation Flow Rate | 0.07 | 0.07 | 0.15 | 0.02 | 0.01 | 0.01 | 0.38 | 0.17 | 0.13 | 0.39 | 0.40 |
| s, saturation flow rate [veh/h] | 1750 | 1750 | 1900 | 1800 | 1900 | 1800 | 5700 | 1900 | 1800 | 3800 | 1900 |
| c, Capacity [veh/h] | 304 | 304 | 330 | 90 | 96 | 60 | 2561 | 854 | 268 | 2148 | 1074 |
| d1, Uniform Delay [s] | 32.92 | 32.94 | 36.01 | 41.31 | 41.21 | 42.76 | 22.02 | 16.51 | 37.38 | 13.87 | 14.27 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.77 | 0.77 | 5.57 | 1.91 | 1.44 | 4.88 | 3.61 | 1.30 | 7.37 | 1.78 | 4.02 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.37 | 0.38 | 0.84 | 0.31 | 0.26 | 0.43 | 0.84 | 0.38 | 0.85 | 0.68 | 0.71 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 33.69 | 33.71 | 41.58 | 43.23 | 42.65 | 47.64 | 25.63 | 17.82 | 44.75 | 15.65 | 18.29 |
| Lane Group LOS | C | C | D | D | D | D | C | B | D | B | B |
| Critical Lane Group | No | No | Yes | Yes | No | No | Yes | No | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 2.24 | 2.25 | 6.26 | 0.64 | 0.57 | 0.64 | 13.46 | 4.60 | 5.36 | 10.03 | 11.40 |
| 50th-Percentile Queue Length [ft/ln] | 55.90 | 56.35 | 156.41 | 16.06 | 14.19 | 16.10 | 336.58 | 115.03 | 133.99 | 250.69 | 284.94 |
| 95th-Percentile Queue Length [veh/ln] | 4.02 | 4.06 | 10.36 | 1.16 | 1.02 | 1.16 | 19.48 | 8.12 | 9.16 | 15.22 | 16.93 |
| 95th-Percentile Queue Length [ft/ln] | 100.61 | 101.43 | 258.96 | 28.91 | 25.54 | 28.97 | 487.02 | 202.97 | 228.90 | 380.53 | 423.35 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 33.70 | 33.71 | 41.58 | 43.23 | 42.65 | 42.65 | 47.64 | 25.63 | 17.82 | 44.75 | 16.52 | 18.29 |
| Movement LOS | C | C | D | D | D | D | D | C | B | D | B | B |
| d_A, Approach Delay [s/veh] | 38.01 | | | 42.95 | | | 24.84 | | | 19.17 | | |
| Approach LOS | D | | | D | | | C | | | B | | |
| d_I, Intersection Delay [s/veh] | 23.70 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.811 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 0.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 34.72 | 34.72 | 0.00 | 34.72 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.392 | 1.988 | 0.000 | 3.279 |
| Crosswalk LOS | B | A | F | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 488 | 133 | 622 | 888 |
| d_b, Bicycle Delay [s] | 25.73 | 39.24 | 21.40 | 13.92 |
| l_b,int, Bicycle LOS Score for Intersection | 2.393 | 1.647 | 2.942 | 2.912 |
| Bicycle LOS | B | A | C | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 4 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



*APPENDIX D-VII*

# YEAR 2045 PLUS PROJECT WITH IMPROVEMENTS TRAFFIC CONDITIONS

Brea Mall Expansion, Brea

Vistro File: N:\...\4099 HCM Network.vistro
Report File: N:\...\AM 2045+P-MIT.pdf

Scenario 18 [MIT] AM 2045+P
4/13/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 14 | State College Boulevard at Imperial Highway | Signalized | HCM 6th Edition | SB Left | 0.830 | 34.7 | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 34.7 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.830 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 125 | 186 | 479 | 151 | 502 | 33 | 37 | 1775 | 214 | 534 | 1953 | 203 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 125 | 186 | 479 | 151 | 502 | 33 | 37 | 1775 | 214 | 534 | 1953 | 203 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 31 | 47 | 120 | 38 | 126 | 8 | 9 | 444 | 54 | 134 | 488 | 51 |
| Total Analysis Volume [veh/h] | 125 | 186 | 479 | 151 | 502 | 33 | 37 | 1775 | 214 | 534 | 1953 | 203 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 115 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 13 | 44 | 0 | 10 | 41 | 0 | 10 | 37 | 0 | 24 | 51 | 51 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 23 | 0 | 0 | 26 | 26 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 6 | 32 | 32 | 6 | 32 | 32 | 4 | 42 | 42 | 19 | 57 | 67 |
| g / C, Green / Cycle | 0.05 | 0.27 | 0.27 | 0.05 | 0.27 | 0.27 | 0.04 | 0.37 | 0.37 | 0.17 | 0.50 | 0.58 |
| (v / s)_i Volume / Saturation Flow Rate | 0.04 | 0.05 | 0.25 | 0.04 | 0.13 | 0.02 | 0.01 | 0.26 | 0.27 | 0.15 | 0.34 | 0.11 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 185 | 1041 | 521 | 185 | 1041 | 521 | 130 | 2080 | 693 | 592 | 2832 | 1111 |
| d1, Uniform Delay [s] | 53.52 | 31.89 | 40.55 | 53.94 | 34.95 | 30.86 | 53.92 | 31.36 | 31.64 | 46.88 | 22.15 | 11.11 |
| k, delay calibration | 0.11 | 0.11 | 0.26 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.23 | 0.08 | 14.71 | 8.39 | 0.35 | 0.05 | 1.19 | 2.11 | 6.67 | 5.42 | 1.40 | 0.36 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.67 | 0.18 | 0.92 | 0.81 | 0.48 | 0.06 | 0.28 | 0.71 | 0.73 | 0.90 | 0.69 | 0.18 |
| d, Delay for Lane Group [s/veh] | 57.76 | 31.97 | 55.26 | 62.32 | 35.29 | 30.92 | 55.11 | 33.47 | 38.30 | 52.30 | 23.55 | 11.48 |
| Lane Group LOS | E | C | E | E | D | C | E | C | D | D | C | B |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 1.88 | 2.00 | 15.13 | 2.38 | 5.92 | 0.69 | 0.54 | 12.03 | 13.30 | 7.91 | 13.42 | 2.47 |
| 50th-Percentile Queue Length [ft/ln] | 47.11 | 49.93 | 378.24 | 59.43 | 148.04 | 17.23 | 13.58 | 300.75 | 332.61 | 197.63 | 335.49 | 61.83 |
| 95th-Percentile Queue Length [veh/ln] | 3.39 | 3.59 | 21.51 | 4.28 | 9.91 | 1.24 | 0.98 | 17.72 | 19.29 | 12.52 | 19.43 | 4.45 |
| 95th-Percentile Queue Length [ft/ln] | 84.80 | 89.87 | 537.71 | 106.97 | 247.81 | 31.01 | 24.44 | 442.96 | 482.16 | 312.90 | 485.68 | 111.29 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 57.76 | 31.97 | 55.26 | 62.32 | 35.29 | 30.92 | 55.11 | 34.27 | 38.30 | 52.30 | 23.55 | 11.48 |
| Movement LOS | E | C | E | E | D | C | E | C | D | D | C | B |
| d_A, Approach Delay [s/veh] | 50.17 | | | 41.03 | | | 35.07 | | | 28.35 | | |
| Approach LOS | D | | | D | | | D | | | C | | |
| d_I, Intersection Delay [s/veh] | 34.74 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.830 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 47.05 | 47.05 | 47.05 | 47.05 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.890 | 2.761 | 3.309 | 3.475 |
| Crosswalk LOS | C | C | C | C |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 695 | 643 | 574 | 817 |
| d_b, Bicycle Delay [s] | 24.47 | 26.47 | 29.25 | 20.12 |
| l_b,int, Bicycle LOS Score for Intersection | 2.211 | 2.126 | 2.395 | 3.039 |
| Bicycle LOS | B | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



Brea Mall Expansion, Brea

Vistro File: N:\...\4099 HCM Network.vistro
Report File: N:\...\PM 2045+P-MIT.pdf

Scenario 17 [MIT] PM 2045+P
4/13/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 14 | State College Boulevard at Imperial Highway | Signalized | HCM 6th Edition | EB Right | 0.961 | 48.0 | D |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 48.0 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.961 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 391 | 655 | 471 | 481 | 339 | 103 | 118 | 2096 | 122 | 497 | 2061 | 591 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 391 | 655 | 471 | 481 | 339 | 103 | 118 | 2096 | 122 | 497 | 2061 | 591 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 98 | 164 | 118 | 120 | 85 | 26 | 30 | 524 | 31 | 124 | 515 | 148 |
| Total Analysis Volume [veh/h] | 391 | 655 | 471 | 481 | 339 | 103 | 118 | 2096 | 122 | 497 | 2061 | 591 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 21 | 41 | 0 | 21 | 41 | 0 | 10 | 37 | 0 | 21 | 48 | 48 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 23 | 0 | 0 | 26 | 26 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 15 | 33 | 33 | 17 | 34 | 34 | 6 | 37 | 37 | 17 | 48 | 69 |
| g / C, Green / Cycle | 0.13 | 0.27 | 0.27 | 0.14 | 0.29 | 0.29 | 0.05 | 0.31 | 0.31 | 0.14 | 0.40 | 0.58 |
| (v / s)_i Volume / Saturation Flow Rate | 0.11 | 0.17 | 0.25 | 0.14 | 0.09 | 0.05 | 0.03 | 0.29 | 0.31 | 0.14 | 0.36 | 0.31 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 452 | 1035 | 517 | 498 | 1085 | 542 | 177 | 1766 | 589 | 498 | 2289 | 1097 |
| d1, Uniform Delay [s] | 51.27 | 38.43 | 42.29 | 51.22 | 33.68 | 32.43 | 56.03 | 40.14 | 41.20 | 51.49 | 33.69 | 15.58 |
| k, delay calibration | 0.11 | 0.11 | 0.32 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 5.06 | 0.65 | 16.08 | 12.20 | 0.16 | 0.17 | 4.28 | 9.97 | 33.85 | 18.15 | 6.24 | 1.90 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.86 | 0.63 | 0.91 | 0.97 | 0.31 | 0.19 | 0.67 | 0.93 | 0.99 | 1.00 | 0.90 | 0.54 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 56.33 | 39.08 | 58.37 | 63.41 | 33.84 | 32.60 | 60.31 | 50.11 | 75.05 | 69.64 | 39.92 | 17.48 |
| Lane Group LOS | E | D | E | E | C | C | E | D | E | E | D | B |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 6.08 | 8.55 | 15.70 | 8.02 | 3.92 | 2.31 | 1.86 | 17.04 | 22.36 | 8.71 | 19.67 | 10.19 |
| 50th-Percentile Queue Length [ft/ln] | 151.94 | 213.77 | 392.39 | 200.45 | 98.01 | 57.63 | 46.60 | 426.06 | 558.91 | 217.70 | 491.70 | 254.70 |
| 95th-Percentile Queue Length [veh/ln] | 10.12 | 13.35 | 22.19 | 12.66 | 7.06 | 4.15 | 3.36 | 23.81 | 30.11 | 13.55 | 26.94 | 15.42 |
| 95th-Percentile Queue Length [ft/ln] | 253.02 | 333.67 | 554.82 | 316.55 | 176.42 | 103.73 | 83.88 | 595.31 | 752.77 | 338.69 | 673.53 | 385.57 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 56.33 | 39.08 | 58.37 | 63.41 | 33.84 | 32.60 | 60.31 | 55.57 | 75.05 | 69.64 | 39.92 | 17.48 |
| Movement LOS | E | D | E | E | C | C | E | E | E | E | D | B |
| d_A, Approach Delay [s/veh] | 49.51 | | | 49.11 | | | 56.82 | | | 40.40 | | |
| Approach LOS | D | | | D | | | E | | | D | | |
| d_I, Intersection Delay [s/veh] | 48.00 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.961 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.54 | 49.54 | 49.54 | 49.54 |
| l_p,int, Pedestrian LOS Score for Intersection | 2.952 | 2.926 | 3.393 | 3.584 |
| Crosswalk LOS | C | C | C | D |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 616 | 616 | 550 | 733 |
| d_b, Bicycle Delay [s] | 28.73 | 28.73 | 31.57 | 24.09 |
| l_b,int, Bicycle LOS Score for Intersection | 2.811 | 2.321 | 2.523 | 3.292 |
| Bicycle LOS | C | B | B | C |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



Brea Mall Expansion, Brea

Vistro File: N:\...\4099 HCM Network.vistro
Report File: N:\...\Sat 2045+P-MIT.pdf

Scenario 16 [MIT] Sat MD 2045+P
4/13/2022

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 14 | State College Boulevard at Imperial Highway | Signalized | HCM 6th Edition | WB Left | 1.286 | 107.4 | F |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**Intersection 14: State College Boulevard at Imperial Highway**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 107.4 |
| Analysis Method: | HCM 6th Edition | Level Of Service: | F |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 1.286 |

**Intersection Setup**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration |  | | |  | | |  | | |  | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Entry Pocket | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Entry Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exit Pocket Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Speed [mph] | 30.00 | | | 30.00 | | | 30.00 | | | 30.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Curb Present | No | | | No | | | No | | | No | | |
| Crosswalk | Yes | | | Yes | | | Yes | | | Yes | | |

**Volumes**

| Name | State College Boulevard | | | State College Boulevard | | | Imperial Highway | | | Imperial Highway | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 331 | 665 | 780 | 677 | 464 | 195 | 146 | 1791 | 244 | 699 | 2208 | 1173 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 331 | 665 | 780 | 677 | 464 | 195 | 146 | 1791 | 244 | 699 | 2208 | 1173 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 83 | 166 | 195 | 169 | 116 | 49 | 37 | 448 | 61 | 175 | 552 | 293 |
| Total Analysis Volume [veh/h] | 331 | 665 | 780 | 677 | 464 | 195 | 146 | 1791 | 244 | 699 | 2208 | 1173 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_di, Inbound Pedestrian Volume crossing m | 0 | | | 0 | | | 0 | | | 0 | | |
| v_co, Outbound Pedestrian Volume crossing | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 | | | 0 | | | 0 | | | 0 | | |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | - |
| Cycle Length [s] | 120 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 0.0 |
| Offset Reference | Lead Green - Beginning of First Green |
| Permissive Mode | SingleBand |
| Lost time [s] | 16.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal Group | 3 | 8 | 0 | 7 | 4 | 0 | 5 | 2 | 0 | 1 | 6 | 6 |
| Auxiliary Signal Groups | | | | | | | | | | | | 6,7 |
| Lead / Lag | Lead | - | - | Lead | - | - | Lead | - | - | Lead | - | - |
| Minimum Green [s] | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | 6 | 6 | 6 |
| Maximum Green [s] | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 0 | 30 | 30 | 30 |
| Amber [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| All red [s] | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 |
| Split [s] | 25 | 42 | 0 | 22 | 39 | 0 | 10 | 34 | 0 | 22 | 46 | 46 |
| Vehicle Extension [s] | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 7 | 7 |
| Pedestrian Clearance [s] | 0 | 30 | 0 | 0 | 28 | 0 | 0 | 23 | 0 | 0 | 26 | 26 |
| Delayed Vehicle Green [s] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| Minimum Recall | No | No | | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group | L | C | R | L | C | R | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 |
| g_i, Effective Green Time [s] | 14 | 38 | 38 | 18 | 42 | 42 | 6 | 30 | 30 | 18 | 42 | 64 |
| g / C, Green / Cycle | 0.11 | 0.32 | 0.32 | 0.15 | 0.35 | 0.35 | 0.05 | 0.25 | 0.25 | 0.15 | 0.35 | 0.53 |
| (v / s)_i Volume / Saturation Flow Rate | 0.09 | 0.18 | 0.41 | 0.19 | 0.12 | 0.10 | 0.04 | 0.27 | 0.27 | 0.20 | 0.39 | 0.62 |
| s, saturation flow rate [veh/h] | 3500 | 3800 | 1900 | 3500 | 3800 | 1900 | 3500 | 5700 | 1900 | 3500 | 5700 | 1900 |
| c, Capacity [veh/h] | 400 | 1198 | 599 | 525 | 1333 | 667 | 176 | 1433 | 478 | 525 | 2002 | 1016 |
| d1, Uniform Delay [s] | 51.98 | 34.11 | 41.09 | 51.00 | 28.80 | 28.18 | 56.49 | 44.93 | 44.93 | 51.00 | 38.93 | 27.93 |
| k, delay calibration | 0.11 | 0.11 | 0.50 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.39 | 0.40 | 147.98 | 133.21 | 0.16 | 0.24 | 9.67 | 41.73 | 64.24 | 151.75 | 54.52 | 81.02 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| X, volume / capacity | 0.83 | 0.56 | 1.30 | 1.29 | 0.35 | 0.29 | 0.83 | 1.06 | 1.08 | 1.33 | 1.10 | 1.15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d, Delay for Lane Group [s/veh] | 56.36 | 34.51 | 189.07 | 184.21 | 28.96 | 28.42 | 66.16 | 86.65 | 109.16 | 202.75 | 93.45 | 108.95 |
| Lane Group LOS | E | C | F | F | C | C | E | F | F | F | F | F |
| Critical Lane Group | No | No | Yes | No | No | No | No | No | Yes | Yes | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | 5.11 | 8.10 | 42.04 | 17.58 | 4.98 | 4.11 | 2.43 | 19.63 | 22.61 | 18.94 | 29.40 | 50.47 |
| 50th-Percentile Queue Length [ft/ln] | 127.83 | 202.40 | 1051.00 | 439.56 | 124.47 | 102.87 | 60.71 | 490.65 | 565.29 | 473.38 | 735.07 | 1261.75 |
| 95th-Percentile Queue Length [veh/ln] | 8.82 | 12.76 | 61.49 | 27.25 | 8.64 | 7.41 | 4.37 | 27.85 | 31.83 | 29.38 | 40.91 | 69.50 |
| 95th-Percentile Queue Length [ft/ln] | 220.54 | 319.06 | 1537.15 | 681.17 | 215.96 | 185.17 | 109.28 | 696.32 | 795.78 | 734.56 | 1022.80 | 1737.56 |

**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 56.36 | 34.51 | 189.07 | 184.21 | 28.96 | 28.42 | 66.16 | 90.07 | 109.16 | 202.75 | 93.45 | 108.95 |
| Movement LOS | E | C | F | F | C | C | E | F | F | F | F | F |
| d_A, Approach Delay [s/veh] | 106.47 | | | 107.55 | | | 90.60 | | | 116.63 | | |
| Approach LOS | F | | | F | | | F | | | F | | |
| d_I, Intersection Delay [s/veh] | 107.36 | | | | | | | | | | | |
| Intersection LOS | F | | | | | | | | | | | |
| Intersection V/C | 1.286 | | | | | | | | | | | |

**Other Modes**

| | | | | |
|---|---|---|---|---|
| g_Walk,mi, Effective Walk Time [s] | 11.0 | 11.0 | 11.0 | 11.0 |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 49.51 | 49.51 | 49.51 | 49.51 |
| l_p,int, Pedestrian LOS Score for Intersection | 3.051 | 3.070 | 3.395 | 3.695 |
| Crosswalk LOS | C | C | C | D |
| s_b, Saturation Flow Rate of the bicycle lane | 2000 | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 633 | 583 | 500 | 700 |
| d_b, Bicycle Delay [s] | 28.02 | 30.11 | 33.75 | 25.35 |
| l_b,int, Bicycle LOS Score for Intersection | 3.025 | 2.662 | 2.459 | 3.804 |
| Bicycle LOS | C | B | B | D |

## Sequence

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



# APPENDIX E

## YEAR 2045 MODELING WORKSHEETS

**1. State College Boulevard at Lambert Road**

**AM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 151 | NORTHBOUND | |
| | THRU | 192 | IN ... | 483 |
| | RIGHT | 133 | OUT ... | 1338 |
| SOUTH BOUND | LEFT | 865 | SOUTHBOUND | |
| | THRU | 582 | IN ... | 1481 |
| | RIGHT | 8 | OUT ... | 665 |
| EAST BOUND | LEFT | 14 | EASTBOUND | |
| | THRU | 1220 | IN ... | 1625 |
| | RIGHT | 196 | OUT ... | 1481 |
| WEST BOUND | LEFT | 431 | WESTBOUND | |
| | THRU | 1519 | IN ... | 2259 |
| | RIGHT | 534 | OUT ... | 2365 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 151 | 182 |
| | THRU | 192 | 233 |
| | RIGHT | 133 | 216 |
| SOUTH BOUND | LEFT | 865 | 972 |
| | THRU | 582 | 629 |
| | RIGHT | 8 | 8 |
| EAST BOUND | LEFT | 14 | 16 |
| | THRU | 1,220 | 1,474 |
| | RIGHT | 196 | 243 |
| WEST BOUND | LEFT | 431 | 503 |
| | THRU | 1,519 | 1,896 |
| | RIGHT | 534 | 605 |

**2. SR-57 SB Ramps at Lambert Road**

**AM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 0 | NORTHBOUND | |
| | THRU | 0 | IN ... | 0 |
| | RIGHT | 0 | OUT ... | 682 |
| SOUTH BOUND | LEFT | 1026 | SOUTHBOUND | |
| | THRU | 0 | IN ... | 1583 |
| | RIGHT | 513 | OUT ... | 0 |
| EAST BOUND | LEFT | 0 | EASTBOUND | |
| | THRU | 1659 | IN ... | 2371 |
| | RIGHT | 565 | OUT ... | 2315 |
| WEST BOUND | LEFT | 217 | WESTBOUND | |
| | THRU | 2027 | IN ... | 2020 |
| | RIGHT | 0 | OUT ... | 2976 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 0 | 0 |
| | THRU | 0 | 0 |
| | RIGHT | 0 | 0 |
| SOUTH BOUND | LEFT | 1,026 | 1,105 |
| | THRU | 0 | 0 |
| | RIGHT | 513 | 743 |
| EAST BOUND | LEFT | 0 | 0 |
| | THRU | 1,659 | 2,001 |
| | RIGHT | 565 | 667 |
| WEST BOUND | LEFT | 217 | 271 |
| | THRU | 2,027 | 2,325 |
| | RIGHT | 0 | 0 |

**3. SR-57 NB Ramps at Lambert Road**

**AM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 1019 | NORTHBOUND | |
| | THRU | 0 | IN ... | 1,466 |
| | RIGHT | 482 | OUT ... | 0 |
| SOUTH BOUND | LEFT | 0 | SOUTHBOUND | |
| | THRU | 0 | IN ... | 0 |
| | RIGHT | 0 | OUT ... | 787 |
| EAST BOUND | LEFT | 275 | EASTBOUND | |
| | THRU | 2399 | IN ... | 2,965 |
| | RIGHT | 0 | OUT ... | 2,032 |
| WEST BOUND | LEFT | 0 | WESTBOUND | |
| | THRU | 1237 | IN ... | 1,562 |
| | RIGHT | 475 | OUT ... | 3,174 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 1,019 | 1,134 |
| | THRU | 0 | 0 |
| | RIGHT | 482 | 542 |
| SOUTH BOUND | LEFT | 0 | 0 |
| | THRU | 0 | 0 |
| | RIGHT | 0 | 0 |
| EAST BOUND | LEFT | 275 | 428 |
| | THRU | 2,399 | 2,660 |
| | RIGHT | 0 | 0 |
| WEST BOUND | LEFT | 0 | 0 |
| | THRU | 1,237 | 1,473 |
| | RIGHT | 475 | 523 |

**4. Randolph Avenue at Birch Street**

**AM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 23 | NORTHBOUND | |
| | THRU | 40 | IN ... | 138 |
| | RIGHT | 85 | OUT ... | 127 |
| SOUTH BOUND | LEFT | 37 | SOUTHBOUND | |
| | THRU | 35 | IN ... | 157 |
| | RIGHT | 25 | OUT ... | 129 |
| EAST BOUND | LEFT | 39 | EASTBOUND | |
| | THRU | 554 | IN ... | 690 |
| | RIGHT | 89 | OUT ... | 586 |
| WEST BOUND | LEFT | 70 | WESTBOUND | |
| | THRU | 468 | IN ... | 653 |
| | RIGHT | 43 | OUT ... | 797 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 23 | 26 |
| | THRU | 40 | 44 |
| | RIGHT | 85 | 98 |
| SOUTH BOUND | LEFT | 37 | 86 |
| | THRU | 35 | 38 |
| | RIGHT | 25 | 37 |
| EAST BOUND | LEFT | 39 | 43 |
| | THRU | 554 | 653 |
| | RIGHT | 89 | 99 |
| WEST BOUND | LEFT | 70 | 84 |
| | THRU | 468 | 594 |
| | RIGHT | 43 | 61 |

**5. State College Boulevard at Birch Street**

**AM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 76 | NORTHBOUND | |
| | THRU | 120 | IN ... | 288 |
| | RIGHT | 96 | OUT ... | 1,101 |
| SOUTH BOUND | LEFT | 628 | SOUTHBOUND | |
| | THRU | 779 | IN ... | 1,673 |
| | RIGHT | 145 | OUT ... | 463 |
| EAST BOUND | LEFT | 75 | EASTBOUND | |
| | THRU | 502 | IN ... | 745 |
| | RIGHT | 47 | OUT ... | 848 |
| WEST BOUND | LEFT | 78 | WESTBOUND | |
| | THRU | 555 | IN ... | 995 |
| | RIGHT | 273 | OUT ... | 1,287 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 76 | 80 |
| | THRU | 120 | 159 |
| | RIGHT | 96 | 105 |
| SOUTH BOUND | LEFT | 628 | 731 |
| | THRU | 779 | 928 |
| | RIGHT | 145 | 244 |
| EAST BOUND | LEFT | 75 | 121 |
| | THRU | 502 | 593 |
| | RIGHT | 47 | 69 |
| WEST BOUND | LEFT | 78 | 103 |
| | THRU | 555 | 622 |
| | RIGHT | 273 | 319 |

**6. S Associated Road at Birch Street**

**AM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 234 | NORTHBOUND | |
| | THRU | 6 | IN ... | 542 |
| | RIGHT | 307 | OUT ... | 554 |
| SOUTH BOUND | LEFT | 55 | SOUTHBOUND | |
| | THRU | 28 | IN ... | 91 |
| | RIGHT | 8 | OUT ... | 19 |
| EAST BOUND | LEFT | 2 | EASTBOUND | |
| | THRU | 909 | IN ... | 1,211 |
| | RIGHT | 302 | OUT ... | 1,060 |
| WEST BOUND | LEFT | 341 | WESTBOUND | |
| | THRU | 747 | IN ... | 1,136 |
| | RIGHT | 11 | OUT ... | 1,348 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 234 | 268 |
| | THRU | 6 | 6 |
| | RIGHT | 307 | 339 |
| SOUTH BOUND | LEFT | 55 | 60 |
| | THRU | 28 | 30 |
| | RIGHT | 8 | 9 |
| EAST BOUND | LEFT | 2 | 5 |
| | THRU | 909 | 1,035 |
| | RIGHT | 302 | 352 |
| WEST BOUND | LEFT | 341 | 375 |
| | THRU | 747 | 829 |
| | RIGHT | 11 | 12 |

**7. Randolph Avenue at Madison Way**

**AM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 25 | NORTHBOUND | |
| | THRU | 130 | IN ... | 153 |
| | RIGHT | 8 | OUT ... | 109 |
| SOUTH BOUND | LEFT | 6 | SOUTHBOUND | |
| | THRU | 119 | IN ... | 72 |
| | RIGHT | 14 | OUT ... | 152 |
| EAST BOUND | LEFT | 32 | EASTBOUND | |
| | THRU | 2 | IN ... | 91 |
| | RIGHT | 57 | OUT ... | 39 |
| WEST BOUND | LEFT | 0 | WESTBOUND | |
| | THRU | 0 | IN ... | 0 |
| | RIGHT | 0 | OUT ... | 16 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 25 | 28 |
| | THRU | 130 | 146 |
| | RIGHT | 8 | 9 |
| SOUTH BOUND | LEFT | 6 | 6 |
| | THRU | 119 | 137 |
| | RIGHT | 14 | 18 |
| EAST BOUND | LEFT | 32 | 36 |
| | THRU | 2 | 3 |
| | RIGHT | 57 | 62 |
| WEST BOUND | LEFT | 0 | 0 |
| | THRU | 0 | 0 |
| | RIGHT | 0 | 0 |

**8. Randolph Avenue at Brea Mall**

**AM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 13 | NORTHBOUND | |
| | THRU | 163 | IN ... | 232 |
| | RIGHT | 66 | OUT ... | 101 |
| SOUTH BOUND | LEFT | 15 | SOUTHBOUND | |
| | THRU | 141 | IN ... | 95 |
| | RIGHT | 6 | OUT ... | 159 |
| EAST BOUND | LEFT | 1 | EASTBOUND | |
| | THRU | 0 | IN ... | 2 |
| | RIGHT | 1 | OUT ... | 19 |
| WEST BOUND | LEFT | 26 | WESTBOUND | |
| | THRU | 0 | IN ... | 31 |
| | RIGHT | 5 | OUT ... | 81 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 13 | 14 |
| | THRU | 163 | 190 |
| | RIGHT | 66 | 72 |
| SOUTH BOUND | LEFT | 15 | 17 |
| | THRU | 141 | 166 |
| | RIGHT | 6 | 6 |
| EAST BOUND | LEFT | 1 | 1 |
| | THRU | 0 | 0 |
| | RIGHT | 1 | 1 |
| WEST BOUND | LEFT | 26 | 28 |
| | THRU | 0 | 0 |
| | RIGHT | 5 | 7 |

**9. Brea Mall South at State College Boulevard**

**AM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 32 | NORTHBOUND | |
| | THRU | 5 | IN ... | 52 |
| | RIGHT | 15 | OUT ... | 44 |
| SOUTH BOUND | LEFT | 3 | SOUTHBOUND | |
| | THRU | 2 | IN ... | 32 |
| | RIGHT | 27 | OUT ... | 94 |
| EAST BOUND | LEFT | 77 | EASTBOUND | |
| | THRU | 238 | IN ... | 326 |
| | RIGHT | 15 | OUT ... | 575 |
| WEST BOUND | LEFT | 27 | WESTBOUND | |
| | THRU | 319 | IN ... | 555 |
| | RIGHT | 12 | OUT ... | 252 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 32 | 34 |
| | THRU | 5 | 9 |
| | RIGHT | 15 | 17 |
| SOUTH BOUND | LEFT | 3 | 3 |
| | THRU | 2 | 6 |
| | RIGHT | 27 | 28 |
| EAST BOUND | LEFT | 77 | 84 |
| | THRU | 238 | 284 |
| | RIGHT | 15 | 17 |
| WEST BOUND | LEFT | 27 | 30 |
| | THRU | 319 | 512 |
| | RIGHT | 12 | 15 |

**10. Harbor Boulevard at Imperial Highway**

**AM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 302 | NORTHBOUND | |
| | THRU | 601 | IN ... | 1390 |
| | RIGHT | 259 | OUT ... | 2666 |
| SOUTH BOUND | LEFT | 143 | SOUTHBOUND | |
| | THRU | 1241 | IN ... | 1795 |
| | RIGHT | 279 | OUT ... | 1143 |
| EAST BOUND | LEFT | 183 | EASTBOUND | |
| | THRU | 1296 | IN ... | 2323 |
| | RIGHT | 361 | OUT ... | 1806 |
| WEST BOUND | LEFT | 282 | WESTBOUND | |
| | THRU | 1143 | IN ... | 1714 |
| | RIGHT | 99 | OUT ... | 1605 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 302 | 387 |
| | THRU | 601 | 773 |
| | RIGHT | 259 | 293 |
| SOUTH BOUND | LEFT | 143 | 179 |
| | THRU | 1,241 | 1,484 |
| | RIGHT | 279 | 334 |
| EAST BOUND | LEFT | 183 | 303 |
| | THRU | 1,296 | 1,465 |
| | RIGHT | 361 | 759 |
| WEST BOUND | LEFT | 282 | 424 |
| | THRU | 1,143 | 1,309 |
| | RIGHT | 99 | 275 |

**11. Puente Street at Imperial Highway**

**AM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 59 | NORTHBOUND | |
| | THRU | 113 | IN ... | 206 |
| | RIGHT | 152 | OUT ... | 212 |
| SOUTH BOUND | LEFT | 120 | SOUTHBOUND | |
| | THRU | 84 | IN ... | 679 |
| | RIGHT | 133 | OUT ... | 465 |
| EAST BOUND | LEFT | 218 | EASTBOUND | |
| | THRU | 1314 | IN ... | 1,700 |
| | RIGHT | 78 | OUT ... | 1,696 |
| WEST BOUND | LEFT | 48 | WESTBOUND | |
| | THRU | 1195 | IN ... | 1,639 |
| | RIGHT | 156 | OUT ... | 1,851 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 59 | 64 |
| | THRU | 113 | 124 |
| | RIGHT | 152 | 166 |
| SOUTH BOUND | LEFT | 120 | 295 |
| | THRU | 84 | 121 |
| | RIGHT | 133 | 263 |
| EAST BOUND | LEFT | 218 | 246 |
| | THRU | 1,314 | 1,450 |
| | RIGHT | 78 | 85 |
| WEST BOUND | LEFT | 48 | 53 |
| | THRU | 1,195 | 1,553 |
| | RIGHT | 156 | 193 |

**12. Brea Boulevard at Imperial Highway**

**AM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 426 | NORTHBOUND | |
| | THRU | 452 | IN ... | 1,212 |
| | RIGHT | 142 | OUT ... | 1,817 |
| SOUTH BOUND | LEFT | 126 | SOUTHBOUND | |
| | THRU | 944 | IN ... | 1,544 |
| | RIGHT | 163 | OUT ... | 807 |
| EAST BOUND | LEFT | 130 | EASTBOUND | |
| | THRU | 1478 | IN ... | 2,223 |
| | RIGHT | 345 | OUT ... | 2,131 |
| WEST BOUND | LEFT | 150 | WESTBOUND | |
| | THRU | 1409 | IN ... | 1,815 |
| | RIGHT | 63 | OUT ... | 2,039 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 426 | 473 |
| | THRU | 452 | 579 |
| | RIGHT | 142 | 187 |
| SOUTH BOUND | LEFT | 126 | 181 |
| | THRU | 944 | 1,217 |
| | RIGHT | 163 | 219 |
| EAST BOUND | LEFT | 130 | 174 |
| | THRU | 1,478 | 1,689 |
| | RIGHT | 345 | 395 |
| WEST BOUND | LEFT | 150 | 205 |
| | THRU | 1,409 | 1,769 |
| | RIGHT | 63 | 122 |

**13. Randolph Avenue at Imperial Highway**

**AM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 15 | NORTHBOUND | |
| | THRU | 14 | IN ... | 84 |
| | RIGHT | 53 | OUT ... | 47 |
| SOUTH BOUND | LEFT | 125 | SOUTHBOUND | |
| | THRU | 14 | IN ... | 183 |
| | RIGHT | 29 | OUT ... | 278 |
| EAST BOUND | LEFT | 58 | EASTBOUND | |
| | THRU | 1516 | IN ... | 1,876 |
| | RIGHT | 9 | OUT ... | 1,703 |
| WEST BOUND | LEFT | 24 | WESTBOUND | |
| | THRU | 1466 | IN ... | 1,797 |
| | RIGHT | 143 | OUT ... | 1,913 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 15 | 39 |
| | THRU | 14 | 20 |
| | RIGHT | 53 | 71 |
| SOUTH BOUND | LEFT | 125 | 140 |
| | THRU | 14 | 22 |
| | RIGHT | 29 | 41 |
| EAST BOUND | LEFT | 58 | 96 |
| | THRU | 1,516 | 1,741 |
| | RIGHT | 9 | 27 |
| WEST BOUND | LEFT | 24 | 43 |
| | THRU | 1,466 | 1,880 |
| | RIGHT | 143 | 164 |

**14. State College Boulevard at Imperial Highway**

**AM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 97 | NORTHBOUND | |
| | THRU | 137 | IN ... | 706 |
| | RIGHT | 397 | OUT ... | 1,206 |
| SOUTH BOUND | LEFT | 84 | SOUTHBOUND | |
| | THRU | 341 | IN ... | 648 |
| | RIGHT | 26 | OUT ... | 300 |
| EAST BOUND | LEFT | 33 | EASTBOUND | |
| | THRU | 1518 | IN ... | 1,941 |
| | RIGHT | 171 | OUT ... | 1,804 |
| WEST BOUND | LEFT | 431 | WESTBOUND | |
| | THRU | 1517 | IN ... | 2,353 |
| | RIGHT | 134 | OUT ... | 2,339 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 97 | 121 |
| | THRU | 137 | 168 |
| | RIGHT | 397 | 479 |
| SOUTH BOUND | LEFT | 84 | 127 |
| | THRU | 341 | 487 |
| | RIGHT | 26 | 33 |
| EAST BOUND | LEFT | 33 | 37 |
| | THRU | 1,518 | 1,733 |
| | RIGHT | 171 | 204 |
| WEST BOUND | LEFT | 431 | 534 |
| | THRU | 1,517 | 1,937 |
| | RIGHT | 134 | 153 |

**15. SR-57 SB Ramps at Imperial Highway**

**AM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 0 | NORTHBOUND | |
| | THRU | 0 | IN ... | 0 |
| | RIGHT | 0 | OUT ... | 622 |
| SOUTH BOUND | LEFT | 574 | SOUTHBOUND | |
| | THRU | 0 | IN ... | 1,167 |
| | RIGHT | 460 | OUT ... | 167 |
| EAST BOUND | LEFT | 0 | EASTBOUND | |
| | THRU | 1410 | IN ... | 2,389 |
| | RIGHT | 639 | OUT ... | 2,376 |
| WEST BOUND | LEFT | 0 | WESTBOUND | |
| | THRU | 1645 | IN ... | 1,957 |
| | RIGHT | 180 | OUT ... | 2,347 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 0 | 0 |
| | THRU | 0 | 0 |
| | RIGHT | 0 | 0 |
| SOUTH BOUND | LEFT | 574 | 642 |
| | THRU | 0 | 0 |
| | RIGHT | 460 | 570 |
| EAST BOUND | LEFT | 0 | 0 |
| | THRU | 1,410 | 1,750 |
| | RIGHT | 639 | 762 |
| WEST BOUND | LEFT | 0 | 0 |
| | THRU | 1,645 | 2,063 |
| | RIGHT | 180 | 212 |

**16. SR-57 NB Ramps at Imperial Highway**

**AM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 831 | NORTHBOUND | |
| | THRU | 175 | IN ... | 1,775 |
| | RIGHT | 783 | OUT ... | 610 |
| SOUTH BOUND | LEFT | 0 | SOUTHBOUND | |
| | THRU | 0 | IN ... | 95 |
| | RIGHT | 95 | OUT ... | 341 |
| EAST BOUND | LEFT | 160 | EASTBOUND | |
| | THRU | 1281 | IN ... | 2,335 |
| | RIGHT | 531 | OUT ... | 2,528 |
| WEST BOUND | LEFT | 0 | WESTBOUND | |
| | THRU | 1400 | IN ... | 1,675 |
| | RIGHT | 6 | OUT ... | 2,399 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 831 | 1,071 |
| | THRU | 175 | 164 |
| | RIGHT | 783 | 893 |
| SOUTH BOUND | LEFT | 0 | 0 |
| | THRU | 0 | 0 |
| | RIGHT | 95 | 95 |
| EAST BOUND | LEFT | 160 | 170 |
| | THRU | 1,281 | 1,559 |
| | RIGHT | 531 | 610 |
| WEST BOUND | LEFT | 0 | 0 |
| | THRU | 1,400 | 1,663 |
| | RIGHT | 6 | 14 |

**17. Associated Road at Imperial Highway**

**AM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 144 | NORTHBOUND | |
| | THRU | 202 | IN ... | 420 |
| | RIGHT | 69 | OUT ... | 347 |
| SOUTH BOUND | LEFT | 145 | SOUTHBOUND | |
| | THRU | 320 | IN ... | 438 |
| | RIGHT | 143 | OUT ... | 352 |
| EAST BOUND | LEFT | 145 | EASTBOUND | |
| | THRU | 1794 | IN ... | 2371 |
| | RIGHT | 97 | OUT ... | 2094 |
| WEST BOUND | LEFT | 89 | WESTBOUND | |
| | THRU | 1538 | IN ... | 2008 |
| | RIGHT | 82 | OUT ... | 2445 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 144 | 155 |
| | THRU | 202 | 222 |
| | RIGHT | 69 | 95 |
| SOUTH BOUND | LEFT | 145 | 179 |
| | THRU | 320 | 352 |
| | RIGHT | 143 | 174 |
| EAST BOUND | LEFT | 145 | 227 |
| | THRU | 1,794 | 2,209 |
| | RIGHT | 97 | 107 |
| WEST BOUND | LEFT | 89 | 98 |
| | THRU | 1,538 | 1,831 |
| | RIGHT | 82 | 107 |

**18. Castlegate Lane/Placentia Avenue at Imperial Highway**

**AM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 168 | NORTHBOUND | |
| | THRU | 12 | IN ... | 345 |
| | RIGHT | 141 | OUT ... | 723 |
| SOUTH BOUND | LEFT | 24 | SOUTHBOUND | |
| | THRU | 27 | IN ... | 65 |
| | RIGHT | 14 | OUT ... | 57 |
| EAST BOUND | LEFT | 13 | EASTBOUND | |
| | THRU | 1756 | IN ... | 2553 |
| | RIGHT | 347 | OUT ... | 1887 |
| WEST BOUND | LEFT | 170 | WESTBOUND | |
| | THRU | 1406 | IN ... | 1901 |
| | RIGHT | 32 | OUT ... | 2197 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 168 | 197 |
| | THRU | 12 | 13 |
| | RIGHT | 141 | 156 |
| SOUTH BOUND | LEFT | 24 | 26 |
| | THRU | 27 | 29 |
| | RIGHT | 14 | 15 |
| EAST BOUND | LEFT | 13 | 15 |
| | THRU | 1,756 | 2,039 |
| | RIGHT | 347 | 490 |
| WEST BOUND | LEFT | 170 | 204 |
| | THRU | 1,406 | 1,675 |
| | RIGHT | 32 | 35 |

**1. State College Boulevard at Lambert Road**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 302 | NORTHBOUND | |
| | THRU | 576 | IN ... | 1196 |
| | RIGHT | 253 | OUT ... | 924 |
| SOUTH BOUND | LEFT | 545 | SOUTHBOUND | |
| | THRU | 372 | IN ... | 878 |
| | RIGHT | 15 | OUT ... | 1298 |
| EAST BOUND | LEFT | 38 | EASTBOUND | |
| | THRU | 1140 | IN ... | 1248 |
| | RIGHT | 245 | OUT ... | 1425 |
| WEST BOUND | LEFT | 316 | WESTBOUND | |
| | THRU | 1008 | IN ... | 2087 |
| | RIGHT | 686 | OUT ... | 1760 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 302 | 336 |
| | THRU | 576 | 646 |
| | RIGHT | 253 | 335 |
| SOUTH BOUND | LEFT | 545 | 616 |
| | THRU | 372 | 432 |
| | RIGHT | 15 | 17 |
| EAST BOUND | LEFT | 38 | 42 |
| | THRU | 1,140 | 1,594 |
| | RIGHT | 245 | 282 |
| WEST BOUND | LEFT | 316 | 429 |
| | THRU | 1,008 | 1,267 |
| | RIGHT | 686 | 778 |

**2. SR-57 SB Ramps at Lambert Road**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 0 | NORTHBOUND | |
| | THRU | 0 | IN ... | 0 |
| | RIGHT | 0 | OUT ... | 949 |
| SOUTH BOUND | LEFT | 443 | SOUTHBOUND | |
| | THRU | 0 | IN ... | 1174 |
| | RIGHT | 697 | OUT ... | 0 |
| EAST BOUND | LEFT | 0 | EASTBOUND | |
| | THRU | 1115 | IN ... | 1683 |
| | RIGHT | 746 | OUT ... | 2384 |
| WEST BOUND | LEFT | 226 | WESTBOUND | |
| | THRU | 1610 | IN ... | 1922 |
| | RIGHT | 0 | OUT ... | 1447 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 0 | 0 |
| | THRU | 0 | 0 |
| | RIGHT | 0 | 0 |
| SOUTH BOUND | LEFT | 443 | 494 |
| | THRU | 0 | 0 |
| | RIGHT | 697 | 914 |
| EAST BOUND | LEFT | 0 | 0 |
| | THRU | 1,115 | 1,563 |
| | RIGHT | 746 | 900 |
| WEST BOUND | LEFT | 226 | 277 |
| | THRU | 1,610 | 1,886 |
| | RIGHT | 0 | 0 |

**3. SR-57 NB Ramps at Lambert Road**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 636 | NORTHBOUND | |
| | THRU | 0 | IN ... | 847 |
| | RIGHT | 260 | OUT ... | 0 |
| SOUTH BOUND | LEFT | 0 | SOUTHBOUND | |
| | THRU | 0 | IN ... | 0 |
| | RIGHT | 0 | OUT ... | 896 |
| EAST BOUND | LEFT | 356 | EASTBOUND | |
| | THRU | 1407 | IN ... | 1,652 |
| | RIGHT | 0 | OUT ... | 1,746 |
| WEST BOUND | LEFT | 0 | WESTBOUND | |
| | THRU | 1024 | IN ... | 1,718 |
| | RIGHT | 511 | OUT ... | 1,573 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 636 | 728 |
| | THRU | 0 | 0 |
| | RIGHT | 260 | 329 |
| SOUTH BOUND | LEFT | 0 | 0 |
| | THRU | 0 | 0 |
| | RIGHT | 0 | 0 |
| EAST BOUND | LEFT | 356 | 615 |
| | THRU | 1,407 | 1,663 |
| | RIGHT | 0 | 0 |
| WEST BOUND | LEFT | 0 | 0 |
| | THRU | 1,024 | 1,244 |
| | RIGHT | 511 | 569 |

**4. Randolph Avenue at Birch Street**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 129 | NORTHBOUND | |
| | THRU | 56 | IN ... | 403 |
| | RIGHT | 162 | OUT ... | 330 |
| SOUTH BOUND | LEFT | 50 | SOUTHBOUND | |
| | THRU | 48 | IN ... | 217 |
| | RIGHT | 106 | OUT ... | 217 |
| EAST BOUND | LEFT | 77 | EASTBOUND | |
| | THRU | 608 | IN ... | 817 |
| | RIGHT | 93 | OUT ... | 1,359 |
| WEST BOUND | LEFT | 183 | WESTBOUND | |
| | THRU | 1034 | IN ... | 1,343 |
| | RIGHT | 38 | OUT ... | 875 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 129 | 143 |
| | THRU | 56 | 75 |
| | RIGHT | 162 | 186 |
| SOUTH BOUND | LEFT | 50 | 55 |
| | THRU | 48 | 53 |
| | RIGHT | 106 | 112 |
| EAST BOUND | LEFT | 77 | 93 |
| | THRU | 608 | 767 |
| | RIGHT | 93 | 103 |
| WEST BOUND | LEFT | 183 | 206 |
| | THRU | 1,034 | 1,212 |
| | RIGHT | 38 | 49 |

**5. State College Boulevard at Birch Street**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 139 | NORTHBOUND | |
| | THRU | 353 | IN ... | 723 |
| | RIGHT | 156 | OUT ... | 624 |
| SOUTH BOUND | LEFT | 310 | SOUTHBOUND | |
| | THRU | 324 | IN ... | 864 |
| | RIGHT | 257 | OUT ... | 1,206 |
| EAST BOUND | LEFT | 194 | EASTBOUND | |
| | THRU | 741 | IN ... | 1,144 |
| | RIGHT | 154 | OUT ... | 1,433 |
| WEST BOUND | LEFT | 141 | WESTBOUND | |
| | THRU | 949 | IN ... | 1,780 |
| | RIGHT | 602 | OUT ... | 1,248 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 139 | 161 |
| | THRU | 353 | 447 |
| | RIGHT | 156 | 174 |
| SOUTH BOUND | LEFT | 310 | 369 |
| | THRU | 324 | 397 |
| | RIGHT | 257 | 344 |
| EAST BOUND | LEFT | 194 | 308 |
| | THRU | 741 | 840 |
| | RIGHT | 154 | 164 |
| WEST BOUND | LEFT | 141 | 147 |
| | THRU | 949 | 1,074 |
| | RIGHT | 602 | 707 |

**6. S Associated Road at Birch Street**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 460 | NORTHBOUND | |
| | THRU | 32 | IN ... | 830 |
| | RIGHT | 342 | OUT ... | 548 |
| SOUTH BOUND | LEFT | 11 | SOUTHBOUND | |
| | THRU | 19 | IN ... | 36 |
| | RIGHT | 6 | OUT ... | 62 |
| EAST BOUND | LEFT | 13 | EASTBOUND | |
| | THRU | 855 | IN ... | 1,183 |
| | RIGHT | 287 | OUT ... | 1,735 |
| WEST BOUND | LEFT | 284 | WESTBOUND | |
| | THRU | 1213 | IN ... | 1,566 |
| | RIGHT | 17 | OUT ... | 1,270 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 460 | 525 |
| | THRU | 32 | 35 |
| | RIGHT | 342 | 373 |
| SOUTH BOUND | LEFT | 11 | 12 |
| | THRU | 19 | 21 |
| | RIGHT | 6 | 9 |
| EAST BOUND | LEFT | 13 | 17 |
| | THRU | 855 | 978 |
| | RIGHT | 287 | 330 |
| WEST BOUND | LEFT | 284 | 310 |
| | THRU | 1,213 | 1,384 |
| | RIGHT | 17 | 18 |

**7. Randolph Avenue at Madison Way**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 46 | NORTHBOUND | |
| | THRU | 308 | IN ... | 451 |
| | RIGHT | 41 | OUT ... | 373 |
| SOUTH BOUND | LEFT | 27 | SOUTHBOUND | |
| | THRU | 245 | IN ... | 305 |
| | RIGHT | 27 | OUT ... | 461 |
| EAST BOUND | LEFT | 60 | EASTBOUND | |
| | THRU | 4 | IN ... | 114 |
| | RIGHT | 50 | OUT ... | 77 |
| WEST BOUND | LEFT | 72 | WESTBOUND | |
| | THRU | 4 | IN ... | 113 |
| | RIGHT | 37 | OUT ... | 72 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 46 | 48 |
| | THRU | 308 | 361 |
| | RIGHT | 41 | 45 |
| SOUTH BOUND | LEFT | 27 | 29 |
| | THRU | 245 | 273 |
| | RIGHT | 27 | 32 |
| EAST BOUND | LEFT | 60 | 68 |
| | THRU | 4 | 4 |
| | RIGHT | 50 | 55 |
| WEST BOUND | LEFT | 72 | 79 |
| | THRU | 4 | 4 |
| | RIGHT | 37 | 38 |

**8. Randolph Avenue at Brea Mall**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 16 | NORTHBOUND | |
| | THRU | 314 | IN ... | 696 |
| | RIGHT | 310 | OUT ... | 626 |
| SOUTH BOUND | LEFT | 36 | SOUTHBOUND | |
| | THRU | 345 | IN ... | 406 |
| | RIGHT | 19 | OUT ... | 432 |
| EAST BOUND | LEFT | 17 | EASTBOUND | |
| | THRU | 3 | IN ... | 32 |
| | RIGHT | 12 | OUT ... | 38 |
| WEST BOUND | LEFT | 263 | WESTBOUND | |
| | THRU | 3 | IN ... | 311 |
| | RIGHT | 45 | OUT ... | 349 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 16 | 17 |
| | THRU | 314 | 367 |
| | RIGHT | 310 | 338 |
| SOUTH BOUND | LEFT | 36 | 39 |
| | THRU | 345 | 392 |
| | RIGHT | 19 | 21 |
| EAST BOUND | LEFT | 17 | 18 |
| | THRU | 3 | 3 |
| | RIGHT | 12 | 12 |
| WEST BOUND | LEFT | 263 | 288 |
| | THRU | 3 | 3 |
| | RIGHT | 45 | 48 |

**9. Brea Mall South at State College Boulevard**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 138 | NORTHBOUND | |
| | THRU | 19 | IN ... | 221 |
| | RIGHT | 64 | OUT ... | 130 |
| SOUTH BOUND | LEFT | 43 | SOUTHBOUND | |
| | THRU | 13 | IN ... | 424 |
| | RIGHT | 368 | OUT ... | 520 |
| EAST BOUND | LEFT | 475 | EASTBOUND | |
| | THRU | 494 | IN ... | 1068 |
| | RIGHT | 22 | OUT ... | 925 |
| WEST BOUND | LEFT | 95 | WESTBOUND | |
| | THRU | 414 | IN ... | 540 |
| | RIGHT | 26 | OUT ... | 678 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 138 | 151 |
| | THRU | 19 | 26 |
| | RIGHT | 64 | 67 |
| SOUTH BOUND | LEFT | 43 | 45 |
| | THRU | 13 | 20 |
| | RIGHT | 368 | 402 |
| EAST BOUND | LEFT | 475 | 519 |
| | THRU | 494 | 596 |
| | RIGHT | 22 | 23 |
| WEST BOUND | LEFT | 95 | 104 |
| | THRU | 414 | 490 |
| | RIGHT | 26 | 28 |

**10. Harbor Boulevard at Imperial Highway**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 426 | NORTHBOUND | |
| | THRU | 1091 | IN ... | 2374 |
| | RIGHT | 211 | OUT ... | 1892 |
| SOUTH BOUND | LEFT | 196 | SOUTHBOUND | |
| | THRU | 852 | IN ... | 1525 |
| | RIGHT | 306 | OUT ... | 1687 |
| EAST BOUND | LEFT | 268 | EASTBOUND | |
| | THRU | 1189 | IN ... | 1837 |
| | RIGHT | 287 | OUT ... | 2645 |
| WEST BOUND | LEFT | 425 | WESTBOUND | |
| | THRU | 1498 | IN ... | 2110 |
| | RIGHT | 219 | OUT ... | 1622 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 426 | 786 |
| | THRU | 1,091 | 1,305 |
| | RIGHT | 211 | 282 |
| SOUTH BOUND | LEFT | 196 | 288 |
| | THRU | 852 | 1,020 |
| | RIGHT | 306 | 439 |
| EAST BOUND | LEFT | 268 | 336 |
| | THRU | 1,189 | 1,353 |
| | RIGHT | 287 | 417 |
| WEST BOUND | LEFT | 425 | 455 |
| | THRU | 1,498 | 1,686 |
| | RIGHT | 219 | 299 |

**11. Puente Street at Imperial Highway**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 35 | NORTHBOUND | |
| | THRU | 47 | IN ... | 159 |
| | RIGHT | 81 | OUT ... | 182 |
| SOUTH BOUND | LEFT | 163 | SOUTHBOUND | |
| | THRU | 104 | IN ... | 496 |
| | RIGHT | 204 | OUT ... | 573 |
| EAST BOUND | LEFT | 125 | EASTBOUND | |
| | THRU | 1421 | IN ... | 1,702 |
| | RIGHT | 37 | OUT ... | 1,981 |
| WEST BOUND | LEFT | 103 | WESTBOUND | |
| | THRU | 1643 | IN ... | 2,279 |
| | RIGHT | 253 | OUT ... | 1,900 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 35 | 38 |
| | THRU | 47 | 51 |
| | RIGHT | 81 | 89 |
| SOUTH BOUND | LEFT | 163 | 236 |
| | THRU | 104 | 113 |
| | RIGHT | 204 | 228 |
| EAST BOUND | LEFT | 125 | 146 |
| | THRU | 1,421 | 1,694 |
| | RIGHT | 37 | 40 |
| WEST BOUND | LEFT | 103 | 112 |
| | THRU | 1,643 | 1,915 |
| | RIGHT | 253 | 399 |

**12. Brea Boulevard at Imperial Highway**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 504 | NORTHBOUND | |
| | THRU | 802 | IN ... | 1,796 |
| | RIGHT | 243 | OUT ... | 1,389 |
| SOUTH BOUND | LEFT | 205 | SOUTHBOUND | |
| | THRU | 629 | IN ... | 1,137 |
| | RIGHT | 175 | OUT ... | 1,378 |
| EAST BOUND | LEFT | 187 | EASTBOUND | |
| | THRU | 1650 | IN ... | 2,385 |
| | RIGHT | 405 | OUT ... | 2,627 |
| WEST BOUND | LEFT | 224 | WESTBOUND | |
| | THRU | 1687 | IN ... | 2,292 |
| | RIGHT | 138 | OUT ... | 2,215 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 504 | 553 |
| | THRU | 802 | 983 |
| | RIGHT | 243 | 290 |
| SOUTH BOUND | LEFT | 205 | 277 |
| | THRU | 629 | 710 |
| | RIGHT | 175 | 228 |
| EAST BOUND | LEFT | 187 | 254 |
| | THRU | 1,650 | 1,928 |
| | RIGHT | 405 | 455 |
| WEST BOUND | LEFT | 224 | 266 |
| | THRU | 1,687 | 1,874 |
| | RIGHT | 138 | 207 |

**13. Randolph Avenue at Imperial Highway**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 43 | NORTHBOUND | |
| | THRU | 33 | IN ... | 137 |
| | RIGHT | 59 | OUT ... | 112 |
| SOUTH BOUND | LEFT | 314 | SOUTHBOUND | |
| | THRU | 24 | IN ... | 477 |
| | RIGHT | 208 | OUT ... | 571 |
| EAST BOUND | LEFT | 245 | EASTBOUND | |
| | THRU | 1593 | IN ... | 1,982 |
| | RIGHT | 27 | OUT ... | 2,335 |
| WEST BOUND | LEFT | 56 | WESTBOUND | |
| | THRU | 1841 | IN ... | 2,490 |
| | RIGHT | 322 | OUT ... | 2,069 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 43 | 61 |
| | THRU | 33 | 41 |
| | RIGHT | 59 | 72 |
| SOUTH BOUND | LEFT | 314 | 350 |
| | THRU | 24 | 32 |
| | RIGHT | 208 | 230 |
| EAST BOUND | LEFT | 245 | 270 |
| | THRU | 1,593 | 1,897 |
| | RIGHT | 27 | 47 |
| WEST BOUND | LEFT | 56 | 77 |
| | THRU | 1,841 | 2,110 |
| | RIGHT | 322 | 356 |

**14. State College Boulevard at Imperial Highway**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 351 | NORTHBOUND | |
| | THRU | 536 | IN ... | 1,432 |
| | RIGHT | 344 | OUT ... | 819 |
| SOUTH BOUND | LEFT | 417 | SOUTHBOUND | |
| | THRU | 275 | IN ... | 790 |
| | RIGHT | 93 | OUT ... | 1,185 |
| EAST BOUND | LEFT | 107 | EASTBOUND | |
| | THRU | 1759 | IN ... | 2,060 |
| | RIGHT | 91 | OUT ... | 2,502 |
| WEST BOUND | LEFT | 439 | WESTBOUND | |
| | THRU | 1787 | IN ... | 3,057 |
| | RIGHT | 465 | OUT ... | 2,832 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 351 | 385 |
| | THRU | 536 | 628 |
| | RIGHT | 344 | 471 |
| SOUTH BOUND | LEFT | 417 | 464 |
| | THRU | 275 | 331 |
| | RIGHT | 93 | 103 |
| EAST BOUND | LEFT | 107 | 118 |
| | THRU | 1,759 | 2,074 |
| | RIGHT | 91 | 118 |
| WEST BOUND | LEFT | 439 | 497 |
| | THRU | 1,787 | 2,034 |
| | RIGHT | 465 | 518 |

**15. SR-57 SB Ramps at Imperial Highway**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 0 | NORTHBOUND | |
| | THRU | 0 | IN ... | 0 |
| | RIGHT | 0 | OUT ... | 860 |
| SOUTH BOUND | LEFT | 651 | SOUTHBOUND | |
| | THRU | 0 | IN ... | 1,230 |
| | RIGHT | 522 | OUT ... | 392 |
| EAST BOUND | LEFT | 0 | EASTBOUND | |
| | THRU | 1637 | IN ... | 2,851 |
| | RIGHT | 902 | OUT ... | 3,058 |
| WEST BOUND | LEFT | 0 | WESTBOUND | |
| | THRU | 2170 | IN ... | 2,792 |
| | RIGHT | 386 | OUT ... | 2,564 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 0 | 0 |
| | THRU | 0 | 0 |
| | RIGHT | 0 | 0 |
| SOUTH BOUND | LEFT | 651 | 721 |
| | THRU | 0 | 0 |
| | RIGHT | 522 | 624 |
| EAST BOUND | LEFT | 0 | 0 |
| | THRU | 1,637 | 1,958 |
| | RIGHT | 902 | 1,083 |
| WEST BOUND | LEFT | 0 | 0 |
| | THRU | 2,170 | 2,434 |
| | RIGHT | 386 | 438 |

**16. SR-57 NB Ramps at Imperial Highway**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 886 | NORTHBOUND | |
| | THRU | 62 | IN ... | 1,355 |
| | RIGHT | 408 | OUT ... | 490 |
| SOUTH BOUND | LEFT | 0 | SOUTHBOUND | |
| | THRU | 0 | IN ... | 256 |
| | RIGHT | 256 | OUT ... | 298 |
| EAST BOUND | LEFT | 191 | EASTBOUND | |
| | THRU | 1738 | IN ... | 2,565 |
| | RIGHT | 360 | OUT ... | 3,786 |
| WEST BOUND | LEFT | 0 | WESTBOUND | |
| | THRU | 2267 | IN ... | 2,646 |
| | RIGHT | 45 | OUT ... | 2,248 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 886 | 1,067 |
| | THRU | 62 | 67 |
| | RIGHT | 408 | 476 |
| SOUTH BOUND | LEFT | 0 | 0 |
| | THRU | 0 | 0 |
| | RIGHT | 256 | 257 |
| EAST BOUND | LEFT | 191 | 198 |
| | THRU | 1,738 | 2,016 |
| | RIGHT | 360 | 490 |
| WEST BOUND | LEFT | 0 | 0 |
| | THRU | 2,267 | 2,607 |
| | RIGHT | 45 | 44 |

**17. Associated Road at Imperial Highway**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 211 | NORTHBOUND | |
| | THRU | 252 | IN ... | 544 |
| | RIGHT | 82 | OUT ... | 639 |
| SOUTH BOUND | LEFT | 284 | SOUTHBOUND | |
| | THRU | 339 | IN ... | 776 |
| | RIGHT | 218 | OUT ... | 565 |
| EAST BOUND | LEFT | 247 | EASTBOUND | |
| | THRU | 1745 | IN ... | 2231 |
| | RIGHT | 137 | OUT ... | 2404 |
| WEST BOUND | LEFT | 170 | WESTBOUND | |
| | THRU | 1641 | IN ... | 2383 |
| | RIGHT | 166 | OUT ... | 2327 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 211 | 222 |
| | THRU | 252 | 275 |
| | RIGHT | 82 | 105 |
| SOUTH BOUND | LEFT | 284 | 312 |
| | THRU | 339 | 371 |
| | RIGHT | 218 | 274 |
| EAST BOUND | LEFT | 247 | 293 |
| | THRU | 1,745 | 2,028 |
| | RIGHT | 137 | 151 |
| WEST BOUND | LEFT | 170 | 213 |
| | THRU | 1,641 | 1,997 |
| | RIGHT | 166 | 201 |

**18. Castlegate Lane/Placentia Avenue at Imperial Highway**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 235 | NORTHBOUND | |
| | THRU | 46 | IN ... | 614 |
| | RIGHT | 258 | OUT ... | 530 |
| SOUTH BOUND | LEFT | 24 | SOUTHBOUND | |
| | THRU | 22 | IN ... | 60 |
| | RIGHT | 14 | OUT ... | 119 |
| EAST BOUND | LEFT | 18 | EASTBOUND | |
| | THRU | 1755 | IN ... | 2263 |
| | RIGHT | 274 | OUT ... | 2461 |
| WEST BOUND | LEFT | 224 | WESTBOUND | |
| | THRU | 1806 | IN ... | 2433 |
| | RIGHT | 55 | OUT ... | 2260 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 235 | 286 |
| | THRU | 46 | 50 |
| | RIGHT | 258 | 282 |
| SOUTH BOUND | LEFT | 24 | 27 |
| | THRU | 22 | 24 |
| | RIGHT | 14 | 16 |
| EAST BOUND | LEFT | 18 | 20 |
| | THRU | 1,755 | 1,954 |
| | RIGHT | 274 | 300 |
| WEST BOUND | LEFT | 224 | 249 |
| | THRU | 1,806 | 2,160 |
| | RIGHT | 55 | 61 |

**1. State College Boulevard at Lambert Road**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 128 | NORTHBOUND | |
| | THRU | 247 | IN ... | 787 |
| | RIGHT | 318 | OUT ... | 1251 |
| SOUTH BOUND | LEFT | 496 | SOUTHBOUND | |
| | THRU | 351 | IN ... | 820 |
| | RIGHT | 5 | OUT ... | 952 |
| EAST BOUND | LEFT | 18 | EASTBOUND | |
| | THRU | 970 | IN ... | 1094 |
| | RIGHT | 259 | OUT ... | 1555 |
| WEST BOUND | LEFT | 650 | WESTBOUND | |
| | THRU | 1334 | IN ... | 2755 |
| | RIGHT | 689 | OUT ... | 1641 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 128 | 154 |
| | THRU | 247 | 290 |
| | RIGHT | 318 | 408 |
| SOUTH BOUND | LEFT | 496 | 574 |
| | THRU | 351 | 406 |
| | RIGHT | 5 | 5 |
| EAST BOUND | LEFT | 18 | 20 |
| | THRU | 970 | 1,301 |
| | RIGHT | 259 | 290 |
| WEST BOUND | LEFT | 650 | 780 |
| | THRU | 1,334 | 1,721 |
| | RIGHT | 689 | 789 |

**2. SR-57 SB Ramps at Lambert Road**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 0 | NORTHBOUND | |
| | THRU | 0 | IN ... | 0 |
| | RIGHT | 0 | OUT ... | 665 |
| SOUTH BOUND | LEFT | 794 | SOUTHBOUND | |
| | THRU | 0 | IN ... | 1854 |
| | RIGHT | 1020 | OUT ... | 0 |
| EAST BOUND | LEFT | 0 | EASTBOUND | |
| | THRU | 1250 | IN ... | 1628 |
| | RIGHT | 520 | OUT ... | 2755 |
| WEST BOUND | LEFT | 165 | WESTBOUND | |
| | THRU | 1654 | IN ... | 1890 |
| | RIGHT | 0 | OUT ... | 1959 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 0 | 0 |
| | THRU | 0 | 0 |
| | RIGHT | 0 | 0 |
| SOUTH BOUND | LEFT | 794 | 879 |
| | THRU | 0 | 0 |
| | RIGHT | 1,020 | 1,309 |
| EAST BOUND | LEFT | 0 | 0 |
| | THRU | 1,250 | 1,659 |
| | RIGHT | 520 | 609 |
| WEST BOUND | LEFT | 165 | 217 |
| | THRU | 1,654 | 1,978 |
| | RIGHT | 0 | 0 |

**3. SR-57 NB Ramps at Lambert Road**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 1031 | NORTHBOUND | |
| | THRU | 0 | IN ... | 1,404 |
| | RIGHT | 421 | OUT ... | 0 |
| SOUTH BOUND | LEFT | 0 | SOUTHBOUND | |
| | THRU | 0 | IN ... | 0 |
| | RIGHT | 0 | OUT ... | 974 |
| EAST BOUND | LEFT | 539 | EASTBOUND | |
| | THRU | 1510 | IN ... | 1,964 |
| | RIGHT | 0 | OUT ... | 1,889 |
| WEST BOUND | LEFT | 0 | WESTBOUND | |
| | THRU | 788 | IN ... | 1,314 |
| | RIGHT | 399 | OUT ... | 1,868 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 1,031 | 1,159 |
| | THRU | 0 | 0 |
| | RIGHT | 421 | 500 |
| SOUTH BOUND | LEFT | 0 | 0 |
| | THRU | 0 | 0 |
| | RIGHT | 0 | 0 |
| EAST BOUND | LEFT | 539 | 752 |
| | THRU | 1,510 | 1,789 |
| | RIGHT | 0 | 0 |
| WEST BOUND | LEFT | 0 | 0 |
| | THRU | 788 | 1,035 |
| | RIGHT | 399 | 448 |

**4. Randolph Avenue at Birch Street**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 96 | NORTHBOUND | |
| | THRU | 74 | IN ... | 338 |
| | RIGHT | 168 | OUT ... | 314 |
| SOUTH BOUND | LEFT | 54 | SOUTHBOUND | |
| | THRU | 37 | IN ... | 192 |
| | RIGHT | 77 | OUT ... | 185 |
| EAST BOUND | LEFT | 86 | EASTBOUND | |
| | THRU | 564 | IN ... | 815 |
| | RIGHT | 121 | OUT ... | 1,037 |
| WEST BOUND | LEFT | 146 | WESTBOUND | |
| | THRU | 710 | IN ... | 1,015 |
| | RIGHT | 25 | OUT ... | 849 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 96 | 107 |
| | THRU | 74 | 81 |
| | RIGHT | 168 | 192 |
| SOUTH BOUND | LEFT | 54 | 63 |
| | THRU | 37 | 39 |
| | RIGHT | 77 | 92 |
| EAST BOUND | LEFT | 86 | 93 |
| | THRU | 564 | 736 |
| | RIGHT | 121 | 134 |
| WEST BOUND | LEFT | 146 | 168 |
| | THRU | 710 | 891 |
| | RIGHT | 25 | 27 |

**5. State College Boulevard at Birch Street**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 123 | NORTHBOUND | |
| | THRU | 263 | IN ... | 706 |
| | RIGHT | 176 | OUT ... | 875 |
| SOUTH BOUND | LEFT | 252 | SOUTHBOUND | |
| | THRU | 549 | IN ... | 1,230 |
| | RIGHT | 429 | OUT ... | 790 |
| EAST BOUND | LEFT | 225 | EASTBOUND | |
| | THRU | 691 | IN ... | 1,172 |
| | RIGHT | 162 | OUT ... | 1,345 |
| WEST BOUND | LEFT | 164 | WESTBOUND | |
| | THRU | 656 | IN ... | 1,137 |
| | RIGHT | 216 | OUT ... | 1,156 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 123 | 165 |
| | THRU | 263 | 340 |
| | RIGHT | 176 | 205 |
| SOUTH BOUND | LEFT | 252 | 301 |
| | THRU | 549 | 645 |
| | RIGHT | 429 | 531 |
| EAST BOUND | LEFT | 225 | 321 |
| | THRU | 691 | 822 |
| | RIGHT | 162 | 180 |
| WEST BOUND | LEFT | 164 | 180 |
| | THRU | 656 | 790 |
| | RIGHT | 216 | 270 |

**6. S Associated Road at Birch Street**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 318 | NORTHBOUND | |
| | THRU | 19 | IN ... | 501 |
| | RIGHT | 167 | OUT ... | 475 |
| SOUTH BOUND | LEFT | 12 | SOUTHBOUND | |
| | THRU | 21 | IN ... | 46 |
| | RIGHT | 13 | OUT ... | 40 |
| EAST BOUND | LEFT | 8 | EASTBOUND | |
| | THRU | 705 | IN ... | 1,071 |
| | RIGHT | 334 | OUT ... | 1,078 |
| WEST BOUND | LEFT | 152 | WESTBOUND | |
| | THRU | 689 | IN ... | 894 |
| | RIGHT | 13 | OUT ... | 927 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 318 | 358 |
| | THRU | 19 | 21 |
| | RIGHT | 167 | 174 |
| SOUTH BOUND | LEFT | 12 | 13 |
| | THRU | 21 | 23 |
| | RIGHT | 13 | 17 |
| EAST BOUND | LEFT | 8 | 11 |
| | THRU | 705 | 855 |
| | RIGHT | 334 | 371 |
| WEST BOUND | LEFT | 152 | 155 |
| | THRU | 689 | 846 |
| | RIGHT | 13 | 15 |

**7. Randolph Avenue at Madison Way**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 21 | NORTHBOUND | |
| | THRU | 273 | IN ... | 545 |
| | RIGHT | 111 | OUT ... | 412 |
| SOUTH BOUND | LEFT | 69 | SOUTHBOUND | |
| | THRU | 259 | IN ... | 365 |
| | RIGHT | 20 | OUT ... | 491 |
| EAST BOUND | LEFT | 34 | EASTBOUND | |
| | THRU | 11 | IN ... | 103 |
| | RIGHT | 58 | OUT ... | 45 |
| WEST BOUND | LEFT | 80 | WESTBOUND | |
| | THRU | 4 | IN ... | 141 |
| | RIGHT | 57 | OUT ... | 191 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 21 | 23 |
| | THRU | 273 | 395 |
| | RIGHT | 111 | 120 |
| SOUTH BOUND | LEFT | 69 | 76 |
| | THRU | 259 | 280 |
| | RIGHT | 20 | 25 |
| EAST BOUND | LEFT | 34 | 40 |
| | THRU | 11 | 12 |
| | RIGHT | 58 | 63 |
| WEST BOUND | LEFT | 80 | 87 |
| | THRU | 4 | 4 |
| | RIGHT | 57 | 60 |

**8. Randolph Avenue at Brea Mall**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 22 | NORTHBOUND | |
| | THRU | 324 | IN ... | 937 |
| | RIGHT | 414 | OUT ... | 726 |
| SOUTH BOUND | LEFT | 41 | SOUTHBOUND | |
| | THRU | 292 | IN ... | 368 |
| | RIGHT | 21 | OUT ... | 564 |
| EAST BOUND | LEFT | 24 | EASTBOUND | |
| | THRU | 14 | IN ... | 64 |
| | RIGHT | 26 | OUT ... | 49 |
| WEST BOUND | LEFT | 380 | WESTBOUND | |
| | THRU | 6 | IN ... | 461 |
| | RIGHT | 75 | OUT ... | 469 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 22 | 26 |
| | THRU | 324 | 467 |
| | RIGHT | 414 | 453 |
| SOUTH BOUND | LEFT | 41 | 45 |
| | THRU | 292 | 336 |
| | RIGHT | 21 | 23 |
| EAST BOUND | LEFT | 24 | 25 |
| | THRU | 14 | 16 |
| | RIGHT | 26 | 28 |
| WEST BOUND | LEFT | 380 | 415 |
| | THRU | 6 | 6 |
| | RIGHT | 75 | 82 |

**9. Brea Mall South at State College Boulevard**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 168 | NORTHBOUND | |
| | THRU | 24 | IN ... | 282 |
| | RIGHT | 90 | OUT ... | 134 |
| SOUTH BOUND | LEFT | 60 | SOUTHBOUND | |
| | THRU | 19 | IN ... | 588 |
| | RIGHT | 509 | OUT ... | 710 |
| EAST BOUND | LEFT | 651 | EASTBOUND | |
| | THRU | 350 | IN ... | 1270 |
| | RIGHT | 29 | OUT ... | 1276 |
| WEST BOUND | LEFT | 86 | WESTBOUND | |
| | THRU | 583 | IN ... | 714 |
| | RIGHT | 35 | OUT ... | 650 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 168 | 184 |
| | THRU | 24 | 34 |
| | RIGHT | 90 | 99 |
| SOUTH BOUND | LEFT | 60 | 65 |
| | THRU | 19 | 29 |
| | RIGHT | 509 | 555 |
| EAST BOUND | LEFT | 651 | 711 |
| | THRU | 350 | 511 |
| | RIGHT | 29 | 41 |
| WEST BOUND | LEFT | 86 | 93 |
| | THRU | 583 | 674 |
| | RIGHT | 35 | 38 |

**10. Harbor Boulevard at Imperial Highway**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 343 | NORTHBOUND | |
| | THRU | 746 | IN ... | 2002 |
| | RIGHT | 198 | OUT ... | 1634 |
| SOUTH BOUND | LEFT | 210 | SOUTHBOUND | |
| | THRU | 775 | IN ... | 1385 |
| | RIGHT | 270 | OUT ... | 1390 |
| EAST BOUND | LEFT | 315 | EASTBOUND | |
| | THRU | 1105 | IN ... | 1778 |
| | RIGHT | 272 | OUT ... | 2257 |
| WEST BOUND | LEFT | 345 | WESTBOUND | |
| | THRU | 1206 | IN ... | 1690 |
| | RIGHT | 175 | OUT ... | 1537 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 343 | 719 |
| | THRU | 746 | 989 |
| | RIGHT | 198 | 282 |
| SOUTH BOUND | LEFT | 210 | 246 |
| | THRU | 775 | 896 |
| | RIGHT | 270 | 315 |
| EAST BOUND | LEFT | 315 | 371 |
| | THRU | 1,105 | 1,277 |
| | RIGHT | 272 | 391 |
| WEST BOUND | LEFT | 345 | 368 |
| | THRU | 1,206 | 1,380 |
| | RIGHT | 175 | 231 |

**11. Puente Street at Imperial Highway**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 26 | NORTHBOUND | |
| | THRU | 30 | IN ... | 147 |
| | RIGHT | 93 | OUT ... | 109 |
| SOUTH BOUND | LEFT | 121 | SOUTHBOUND | |
| | THRU | 42 | IN ... | 297 |
| | RIGHT | 114 | OUT ... | 322 |
| EAST BOUND | LEFT | 69 | EASTBOUND | |
| | THRU | 1269 | IN ... | 1,476 |
| | RIGHT | 36 | OUT ... | 1,551 |
| WEST BOUND | LEFT | 77 | WESTBOUND | |
| | THRU | 1308 | IN ... | 1,839 |
| | RIGHT | 148 | OUT ... | 1,703 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 26 | 28 |
| | THRU | 30 | 33 |
| | RIGHT | 93 | 107 |
| SOUTH BOUND | LEFT | 121 | 184 |
| | THRU | 42 | 46 |
| | RIGHT | 114 | 134 |
| EAST BOUND | LEFT | 69 | 86 |
| | THRU | 1,269 | 1,413 |
| | RIGHT | 36 | 39 |
| WEST BOUND | LEFT | 77 | 84 |
| | THRU | 1,308 | 1,451 |
| | RIGHT | 148 | 242 |

**12. Brea Boulevard at Imperial Highway**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 399 | NORTHBOUND | |
| | THRU | 471 | IN ... | 1,404 |
| | RIGHT | 260 | OUT ... | 1,542 |
| SOUTH BOUND | LEFT | 259 | SOUTHBOUND | |
| | THRU | 826 | IN ... | 1,389 |
| | RIGHT | 173 | OUT ... | 1,101 |
| EAST BOUND | LEFT | 176 | EASTBOUND | |
| | THRU | 1379 | IN ... | 1,942 |
| | RIGHT | 255 | OUT ... | 2,122 |
| WEST BOUND | LEFT | 333 | WESTBOUND | |
| | THRU | 1305 | IN ... | 2,049 |
| | RIGHT | 145 | OUT ... | 2,025 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 399 | 451 |
| | THRU | 471 | 664 |
| | RIGHT | 260 | 291 |
| SOUTH BOUND | LEFT | 259 | 490 |
| | THRU | 826 | 980 |
| | RIGHT | 173 | 266 |
| EAST BOUND | LEFT | 176 | 288 |
| | THRU | 1,379 | 1,446 |
| | RIGHT | 255 | 302 |
| WEST BOUND | LEFT | 333 | 369 |
| | THRU | 1,305 | 1,477 |
| | RIGHT | 145 | 435 |

**13. Randolph Avenue at Imperial Highway**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 67 | NORTHBOUND | |
| | THRU | 38 | IN ... | 283 |
| | RIGHT | 172 | OUT ... | 238 |
| SOUTH BOUND | LEFT | 398 | SOUTHBOUND | |
| | THRU | 76 | IN ... | 448 |
| | RIGHT | 285 | OUT ... | 686 |
| EAST BOUND | LEFT | 307 | EASTBOUND | |
| | THRU | 1422 | IN ... | 1,891 |
| | RIGHT | 32 | OUT ... | 2,221 |
| WEST BOUND | LEFT | 109 | WESTBOUND | |
| | THRU | 1561 | IN ... | 2,472 |
| | RIGHT | 450 | OUT ... | 2,113 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 67 | 107 |
| | THRU | 38 | 49 |
| | RIGHT | 172 | 209 |
| SOUTH BOUND | LEFT | 398 | 441 |
| | THRU | 76 | 90 |
| | RIGHT | 285 | 314 |
| EAST BOUND | LEFT | 307 | 338 |
| | THRU | 1,422 | 1,672 |
| | RIGHT | 32 | 68 |
| WEST BOUND | LEFT | 109 | 151 |
| | THRU | 1,561 | 1,984 |
| | RIGHT | 450 | 497 |

**14. State College Boulevard at Imperial Highway**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 265 | NORTHBOUND | |
| | THRU | 499 | IN ... | 1,749 |
| | RIGHT | 562 | OUT ... | 1,203 |
| SOUTH BOUND | LEFT | 561 | SOUTHBOUND | |
| | THRU | 376 | IN ... | 1,126 |
| | RIGHT | 177 | OUT ... | 1,946 |
| EAST BOUND | LEFT | 132 | EASTBOUND | |
| | THRU | 1491 | IN ... | 1,907 |
| | RIGHT | 176 | OUT ... | 2,570 |
| WEST BOUND | LEFT | 633 | WESTBOUND | |
| | THRU | 1763 | IN ... | 3,900 |
| | RIGHT | 922 | OUT ... | 3,022 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 265 | 326 |
| | THRU | 499 | 655 |
| | RIGHT | 562 | 780 |
| SOUTH BOUND | LEFT | 561 | 617 |
| | THRU | 376 | 442 |
| | RIGHT | 177 | 195 |
| EAST BOUND | LEFT | 132 | 146 |
| | THRU | 1,491 | 1,758 |
| | RIGHT | 176 | 239 |
| WEST BOUND | LEFT | 633 | 699 |
| | THRU | 1,763 | 2,178 |
| | RIGHT | 922 | 1,155 |

**15. SR-57 SB Ramps at Imperial Highway**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 0 | NORTHBOUND | |
| | THRU | 0 | IN ... | 0 |
| | RIGHT | 0 | OUT ... | 945 |
| SOUTH BOUND | LEFT | 536 | SOUTHBOUND | |
| | THRU | 0 | IN ... | 1,332 |
| | RIGHT | 726 | OUT ... | 366 |
| EAST BOUND | LEFT | 0 | EASTBOUND | |
| | THRU | 1895 | IN ... | 3,349 |
| | RIGHT | 1011 | OUT ... | 3,733 |
| WEST BOUND | LEFT | 0 | WESTBOUND | |
| | THRU | 2455 | IN ... | 3,172 |
| | RIGHT | 353 | OUT ... | 2,770 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 0 | 0 |
| | THRU | 0 | 0 |
| | RIGHT | 0 | 0 |
| SOUTH BOUND | LEFT | 536 | 583 |
| | THRU | 0 | 0 |
| | RIGHT | 726 | 831 |
| EAST BOUND | LEFT | 0 | 0 |
| | THRU | 1,895 | 2,323 |
| | RIGHT | 1,011 | 1,242 |
| WEST BOUND | LEFT | 0 | 0 |
| | THRU | 2,455 | 2,848 |
| | RIGHT | 353 | 366 |

**16. SR-57 NB Ramps at Imperial Highway**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 1261 | NORTHBOUND | |
| | THRU | 156 | IN ... | 1,968 |
| | RIGHT | 552 | OUT ... | 690 |
| SOUTH BOUND | LEFT | 0 | SOUTHBOUND | |
| | THRU | 0 | IN ... | 236 |
| | RIGHT | 236 | OUT ... | 447 |
| EAST BOUND | LEFT | 259 | EASTBOUND | |
| | THRU | 1727 | IN ... | 2,896 |
| | RIGHT | 554 | OUT ... | 3,798 |
| WEST BOUND | LEFT | 0 | WESTBOUND | |
| | THRU | 1771 | IN ... | 2,231 |
| | RIGHT | 32 | OUT ... | 2,392 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 1,261 | 1,568 |
| | THRU | 156 | 134 |
| | RIGHT | 552 | 636 |
| SOUTH BOUND | LEFT | 0 | 0 |
| | THRU | 0 | 0 |
| | RIGHT | 236 | 270 |
| EAST BOUND | LEFT | 259 | 281 |
| | THRU | 1,727 | 2,075 |
| | RIGHT | 554 | 690 |
| WEST BOUND | LEFT | 0 | 0 |
| | THRU | 1,771 | 2,208 |
| | RIGHT | 32 | 38 |

**17. Associated Road at Imperial Highway**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 238 | NORTHBOUND | |
| | THRU | 181 | IN ... | 526 |
| | RIGHT | 109 | OUT ... | 607 |
| SOUTH BOUND | LEFT | 324 | SOUTHBOUND | |
| | THRU | 233 | IN ... | 658 |
| | RIGHT | 180 | OUT ... | 458 |
| EAST BOUND | LEFT | 211 | EASTBOUND | |
| | THRU | 1652 | IN ... | 2208 |
| | RIGHT | 239 | OUT ... | 2209 |
| WEST BOUND | LEFT | 144 | WESTBOUND | |
| | THRU | 1449 | IN ... | 2225 |
| | RIGHT | 205 | OUT ... | 2309 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
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*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 238 | 260 |
| | THRU | 181 | 195 |
| | RIGHT | 109 | 142 |
| SOUTH BOUND | LEFT | 324 | 321 |
| | THRU | 233 | 250 |
| | RIGHT | 180 | 203 |
| EAST BOUND | LEFT | 211 | 253 |
| | THRU | 1,652 | 1,992 |
| | RIGHT | 239 | 265 |
| WEST BOUND | LEFT | 144 | 192 |
| | THRU | 1,449 | 1,823 |
| | RIGHT | 205 | 228 |

**18. Castlegate Lane/Placentia Avenue at Imperial Highway**

**PM PEAK HOUR**

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

| APPROACH | TURN MOVEMENT | BY COUNT | APPROACH | FY TOTAL |
|---|---|---|---|---|
| NORTH BOUND | LEFT | 154 | NORTHBOUND | |
| | THRU | 17 | IN ... | 496 |
| | RIGHT | 231 | OUT ... | 493 |
| SOUTH BOUND | LEFT | 25 | SOUTHBOUND | |
| | THRU | 11 | IN ... | 48 |
| | RIGHT | 12 | OUT ... | 86 |
| EAST BOUND | LEFT | 24 | EASTBOUND | |
| | THRU | 1817 | IN ... | 2329 |
| | RIGHT | 272 | OUT ... | 2378 |
| WEST BOUND | LEFT | 200 | WESTBOUND | |
| | THRU | 1727 | IN ... | 2399 |
| | RIGHT | 45 | OUT ... | 2313 |

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
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*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

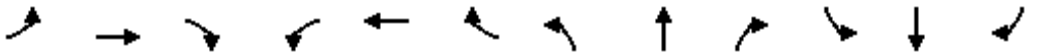
| APPROACH | TURN MOVEMENT | BY COUNT | FY FORECAST |
|---|---|---|---|
| NORTH BOUND | LEFT | 154 | 206 |
| | THRU | 17 | 18 |
| | RIGHT | 231 | 272 |
| SOUTH BOUND | LEFT | 25 | 28 |
| | THRU | 11 | 12 |
| | RIGHT | 12 | 13 |
| EAST BOUND | LEFT | 24 | 26 |
| | THRU | 1,817 | 2,133 |
| | RIGHT | 272 | 314 |
| WEST BOUND | LEFT | 200 | 223 |
| | THRU | 1,727 | 2,159 |
| | RIGHT | 45 | 50 |

# APPENDIX F

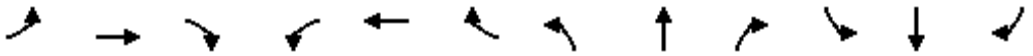
## SYNCHRO QUEUING WORKSHEETS

*APPENDIX F-I*

# YEAR 2026 TRAFFIC CONDITIONS



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 62 | 1683 | 26 | 41 | 1790 | 154 | 37 | 19 | 68 | 133 | 21 | 32 |
| Future Volume (vph) | 62 | 1683 | 26 | 41 | 1790 | 154 | 37 | 19 | 68 | 133 | 21 | 32 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (ft) | 165 | | 0 | 190 | | 310 | 0 | | 0 | 160 | | 0 |
| Storage Lanes | 2 | | 0 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.91 | 0.91 | 1.00 | 0.91 | 1.00 | 0.91 | 0.91 | 0.95 | 0.97 | 1.00 | 1.00 |
| Frt | | 0.998 | | | | 0.850 | | 0.888 | | | 0.909 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | 0.998 | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 4808 | 0 | 1676 | 4818 | 1500 | 1526 | 2846 | 0 | 3252 | 1604 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | 0.998 | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 4808 | 0 | 1676 | 4818 | 1500 | 1526 | 2846 | 0 | 3252 | 1604 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 2 | | | | 167 | | 88 | | | 40 | |
| Link Speed (mph) | | 45 | | | 45 | | | 30 | | | 40 | |
| Link Distance (ft) | | 3572 | | | 626 | | | 275 | | | 499 | |
| Travel Time (s) | | 54.1 | | | 9.5 | | | 6.3 | | | 8.5 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.85 | 0.85 | 0.85 | 0.77 | 0.77 | 0.77 | 0.81 | 0.81 | 0.81 |
| Adj. Flow (vph) | 69 | 1870 | 29 | 48 | 2106 | 181 | 48 | 25 | 88 | 164 | 26 | 40 |
| Shared Lane Traffic (%) | | | | | | | 10% | | | | | |
| Lane Group Flow (vph) | 69 | 1899 | 0 | 48 | 2106 | 181 | 43 | 118 | 0 | 164 | 66 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | Perm | Split | NA | | Split | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | | | | 8 | | | | | | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Minimum Split (s) | 10.0 | 40.0 | | 10.0 | 41.0 | 41.0 | 11.0 | 11.0 | | 41.0 | 41.0 | |
| Total Split (s) | 11.0 | 58.0 | | 10.0 | 57.0 | 57.0 | 11.0 | 11.0 | | 41.0 | 41.0 | |
| Total Split (%) | 9.2% | 48.3% | | 8.3% | 47.5% | 47.5% | 9.2% | 9.2% | | 34.2% | 34.2% | |
| Maximum Green (s) | 7.0 | 53.0 | | 6.0 | 52.0 | 52.0 | 6.0 | 6.0 | | 36.0 | 36.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lag | Lead | | Lag | Lead | Lead | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | C-Max | | None | C-Max | C-Max | Max | Max | | Max | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | | 28.0 | | | 29.0 | 29.0 | | | | 29.0 | 29.0 | |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | 2 | | | | 2 | 2 | |
| Act Effct Green (s) | 6.8 | 53.0 | | 6.0 | 52.2 | 52.2 | 8.0 | 8.0 | | 36.0 | 36.0 | |
| Actuated g/C Ratio | 0.06 | 0.44 | | 0.05 | 0.44 | 0.44 | 0.07 | 0.07 | | 0.30 | 0.30 | |
| v/c Ratio | 0.38 | 0.89 | | 0.58 | 1.01 | 0.24 | 0.43 | 0.44 | | 0.17 | 0.13 | |
| Control Delay | 34.3 | 8.5 | | 50.0 | 23.8 | 0.5 | 69.0 | 23.6 | | 25.8 | 12.2 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 1.9 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 34.3 | 8.5 | | 50.0 | 25.6 | 0.5 | 69.0 | 23.6 | | 25.8 | 12.2 | |
| LOS | C | A | | D | C | A | E | C | | C | B | |
| Approach Delay | | 9.4 | | | 24.2 | | | 35.8 | | | 21.9 | |
| Approach LOS | | A | | | C | | | D | | | C | |
| Queue Length 50th (ft) | 29 | 47 | | 40 | ~97 | 0 | 36 | 12 | | 38 | 8 | |
| Queue Length 95th (ft) | m32 | m53 | | m46 | #109 | m1 | #72 | 32 | | 70 | 48 | |
| Internal Link Dist (ft) | | 3492 | | | 546 | | | 195 | | | 419 | |
| Turn Bay Length (ft) | 165 | | | 190 | | 310 | | | | 160 | | |
| Base Capacity (vph) | 189 | 2124 | | 83 | 2095 | 746 | 101 | 271 | | 975 | 509 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 14 | 0 | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 0.37 | 0.89 | | 0.58 | 1.01 | 0.24 | 0.43 | 0.44 | | 0.17 | 0.13 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green | | | |
| Natural Cycle: 115 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 1.01 | | | |
| Intersection Signal Delay: 18.3 | | Intersection LOS: B | |
| Intersection Capacity Utilization 55.5% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |

~ Volume exceeds capacity, queue is theoretically infinite.

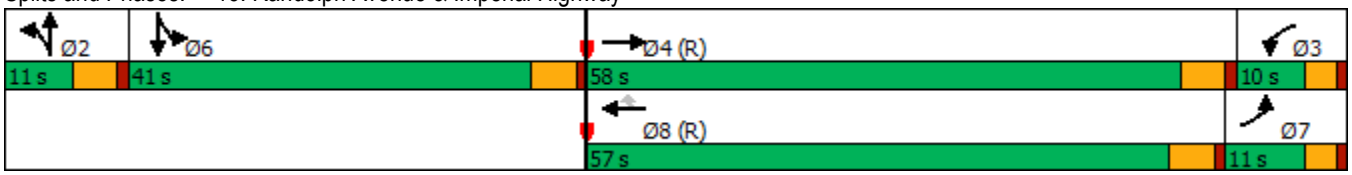
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

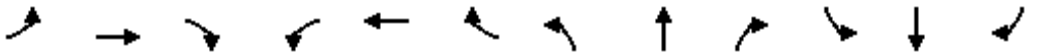
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Randolph Avenue & Imperial Highway



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 35 | 1684 | 194 | 462 | 1845 | 146 | 115 | 160 | 429 | 102 | 392 | 28 |
| Future Volume (vph) | 35 | 1684 | 194 | 462 | 1845 | 146 | 115 | 160 | 429 | 102 | 392 | 28 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1000 | 1800 | 1800 |
| Storage Length (ft) | 180 | | 290 | 325 | | 250 | 150 | | 200 | 260 | | 0 |
| Storage Lanes | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | | 0 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.86 | 0.86 | 0.97 | 0.91 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 0.95 |
| Frt | | 0.985 | | | | 0.850 | | | 0.850 | | 0.990 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 5980 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 1807 | 3319 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 5980 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 1807 | 3319 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 24 | | | | 153 | | | 370 | | 6 | |
| Link Speed (mph) | | 45 | | | 45 | | | 40 | | | 40 | |
| Link Distance (ft) | | 626 | | | 521 | | | 1426 | | | 728 | |
| Travel Time (s) | | 9.5 | | | 7.9 | | | 24.3 | | | 12.4 | |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.90 | 0.90 | 0.90 | 0.91 | 0.91 | 0.91 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 38 | 1851 | 213 | 513 | 2050 | 162 | 126 | 176 | 471 | 109 | 417 | 30 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 38 | 2064 | 0 | 513 | 2050 | 162 | 126 | 176 | 471 | 109 | 447 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 2.17 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | pm+ov | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | 8 | | | 2 | | | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | |
| Minimum Split (s) | 10.0 | 35.0 | | 10.0 | 42.0 | 10.0 | 10.0 | 42.0 | 42.0 | 10.0 | 40.0 | |
| Total Split (s) | 10.0 | 42.0 | | 23.0 | 55.0 | 13.0 | 13.0 | 42.0 | 42.0 | 13.0 | 42.0 | |
| Total Split (%) | 8.3% | 35.0% | | 19.2% | 45.8% | 10.8% | 10.8% | 35.0% | 35.0% | 10.8% | 35.0% | |
| Maximum Green (s) | 6.0 | 37.0 | | 19.0 | 50.0 | 9.0 | 9.0 | 37.0 | 37.0 | 9.0 | 37.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | |
| Lead/Lag | Lag | Lag | | Lead | Lead | Lag | Lag | Lead | Lead | Lag | Lead | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | C-Max | | None | C-Max | None | None | Max | Max | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | 7.0 | | 7.0 | |
| Flash Dont Walk (s) | | 23.0 | | | 30.0 | | | 30.0 | 30.0 | | 28.0 | |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | | | 2 | 2 | | 2 | |
| Act Effct Green (s) | 6.0 | 37.0 | | 19.0 | 54.0 | 68.0 | 9.0 | 37.0 | 37.0 | 9.0 | 37.0 | |
| Actuated g/C Ratio | 0.05 | 0.31 | | 0.16 | 0.45 | 0.57 | 0.08 | 0.31 | 0.31 | 0.08 | 0.31 | |
| v/c Ratio | 0.23 | 1.11 | | 1.00 | 0.95 | 0.18 | 0.52 | 0.17 | 0.66 | 0.81 | 0.44 | |
| Control Delay | 37.4 | 76.6 | | 77.8 | 42.1 | 5.2 | 61.5 | 30.9 | 12.8 | 78.5 | 14.1 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 7.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 37.4 | 76.6 | | 77.8 | 49.4 | 5.2 | 61.5 | 30.9 | 12.8 | 78.5 | 14.1 | |
| LOS | D | E | | E | D | A | E | C | B | E | B | |
| Approach Delay | | 75.9 | | | 52.1 | | | 24.8 | | | 26.7 | |
| Approach LOS | | E | | | D | | | C | | | C | |
| Queue Length 50th (ft) | 12 | ~509 | | 199 | ~624 | 16 | 49 | 52 | 58 | 45 | 49 | |
| Queue Length 95th (ft) | m17 | #588 | | m#286 | #722 | m25 | 81 | 81 | 179 | #98 | 70 | |
| Internal Link Dist (ft) | | 546 | | | 441 | | | 1346 | | | 648 | |
| Turn Bay Length (ft) | 180 | | | 325 | | 250 | 150 | | 200 | 260 | | |
| Base Capacity (vph) | 162 | 1860 | | 515 | 2169 | 907 | 243 | 1033 | 718 | 135 | 1027 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 120 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.23 | 1.11 | | 1.00 | 1.00 | 0.18 | 0.52 | 0.17 | 0.66 | 0.81 | 0.44 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 45 (38%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow | | | |
| Natural Cycle: 115 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 1.11 | | | |
| Intersection Signal Delay: 54.5 | | Intersection LOS: D | |
| Intersection Capacity Utilization 75.5% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

~ Volume exceeds capacity, queue is theoretically infinite.

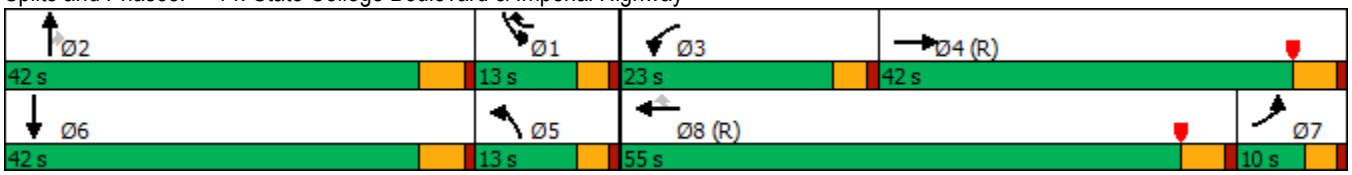
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: State College Boulevard & Imperial Highway



*APPENDIX F-II*

# YEAR 2026 PLUS PROJECT TRAFFIC CONDITIONS

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 104 | 1683 | 26 | 41 | 1790 | 172 | 37 | 19 | 68 | 185 | 21 | 69 |
| Future Volume (vph) | 104 | 1683 | 26 | 41 | 1790 | 172 | 37 | 19 | 68 | 185 | 21 | 69 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (ft) | 165 | | 0 | 190 | | 310 | 0 | | 0 | 160 | | 0 |
| Storage Lanes | 2 | | 0 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.91 | 0.91 | 1.00 | 0.91 | 1.00 | 0.91 | 0.91 | 0.95 | 0.97 | 1.00 | 1.00 |
| Frt | | 0.998 | | | | 0.850 | | 0.888 | | | 0.885 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | 0.998 | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 4808 | 0 | 1676 | 4818 | 1500 | 1526 | 2846 | 0 | 3252 | 1562 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | 0.998 | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 4808 | 0 | 1676 | 4818 | 1500 | 1526 | 2846 | 0 | 3252 | 1562 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 2 | | | | 186 | | 88 | | | 85 | |
| Link Speed (mph) | | 45 | | | 45 | | | 30 | | | 40 | |
| Link Distance (ft) | | 3572 | | | 626 | | | 275 | | | 499 | |
| Travel Time (s) | | 54.1 | | | 9.5 | | | 6.3 | | | 8.5 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.85 | 0.85 | 0.85 | 0.77 | 0.77 | 0.77 | 0.81 | 0.81 | 0.81 |
| Adj. Flow (vph) | 116 | 1870 | 29 | 48 | 2106 | 202 | 48 | 25 | 88 | 228 | 26 | 85 |
| Shared Lane Traffic (%) | | | | | | | 10% | | | | | |
| Lane Group Flow (vph) | 116 | 1899 | 0 | 48 | 2106 | 202 | 43 | 118 | 0 | 228 | 111 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | Perm | Split | NA | | Split | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | | | | 8 | | | | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Minimum Split (s) | 10.0 | 40.0 | | 10.0 | 41.0 | 41.0 | 11.0 | 11.0 | | 41.0 | 41.0 | |
| Total Split (s) | 11.0 | 58.0 | | 10.0 | 57.0 | 57.0 | 11.0 | 11.0 | | 41.0 | 41.0 | |
| Total Split (%) | 9.2% | 48.3% | | 8.3% | 47.5% | 47.5% | 9.2% | 9.2% | | 34.2% | 34.2% | |
| Maximum Green (s) | 7.0 | 53.0 | | 6.0 | 52.0 | 52.0 | 6.0 | 6.0 | | 36.0 | 36.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lag | Lead | | Lag | Lead | Lead | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | C-Max | | None | C-Max | C-Max | Max | Max | | Max | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | | 28.0 | | | 29.0 | 29.0 | | | | 29.0 | 29.0 | |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | 2 | | | | 2 | 2 | |
| Act Effct Green (s) | 7.0 | 55.0 | | 6.0 | 52.0 | 52.0 | 6.0 | 6.0 | | 36.0 | 36.0 | |
| Actuated g/C Ratio | 0.06 | 0.46 | | 0.05 | 0.43 | 0.43 | 0.05 | 0.05 | | 0.30 | 0.30 | |
| v/c Ratio | 0.62 | 0.86 | | 0.58 | 1.01 | 0.27 | 0.57 | 0.52 | | 0.23 | 0.21 | |
| Control Delay | 37.9 | 7.9 | | 49.7 | 24.6 | 0.6 | 83.4 | 27.0 | | 31.9 | 14.9 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 2.1 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 37.9 | 7.9 | | 49.7 | 26.7 | 0.6 | 83.4 | 27.0 | | 31.9 | 14.9 | |
| LOS | D | A | | D | C | A | F | C | | C | B | |
| Approach Delay | | 9.6 | | | 25.0 | | | 42.1 | | | 26.3 | |
| Approach LOS | | A | | | C | | | D | | | C | |
| Queue Length 50th (ft) | 49 | 54 | | 40 | ~98 | 0 | 36 | 12 | | 54 | 6 | |
| Queue Length 95th (ft) | m52 | m57 | | m46 | #110 | m1 | #72 | 32 | | 103 | 72 | |
| Internal Link Dist (ft) | | 3492 | | | 546 | | | 195 | | | 419 | |
| Turn Bay Length (ft) | 165 | | | 190 | | 310 | | | | 160 | | |
| Base Capacity (vph) | 189 | 2203 | | 83 | 2087 | 755 | 76 | 226 | | 975 | 528 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 15 | 0 | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 0.61 | 0.86 | | 0.58 | 1.02 | 0.27 | 0.57 | 0.52 | | 0.23 | 0.21 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green | | | |
| Natural Cycle: 115 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 1.01 | | | |
| Intersection Signal Delay: 19.3 | | Intersection LOS: B | |
| Intersection Capacity Utilization 65.4% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

~ Volume exceeds capacity, queue is theoretically infinite.

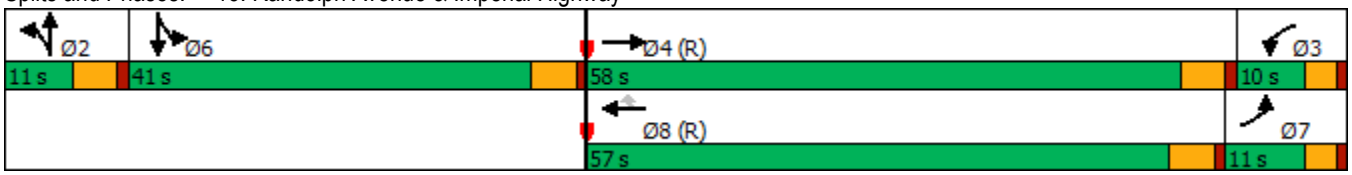
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Randolph Avenue & Imperial Highway



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 35 | 1725 | 204 | 462 | 1859 | 196 | 119 | 178 | 429 | 126 | 407 | 28 |
| Future Volume (vph) | 35 | 1725 | 204 | 462 | 1859 | 196 | 119 | 178 | 429 | 126 | 407 | 28 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1000 | 1800 | 1800 |
| Storage Length (ft) | 180 | | 290 | 325 | | 250 | 150 | | 200 | 260 | | 0 |
| Storage Lanes | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | | 0 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.86 | 0.86 | 0.97 | 0.91 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 0.95 |
| Frt | | 0.984 | | | | 0.850 | | | 0.850 | | 0.990 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 5973 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 1807 | 3319 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 5973 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 1807 | 3319 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 25 | | | | 204 | | | 361 | | 6 | |
| Link Speed (mph) | | 45 | | | 45 | | | 40 | | | 40 | |
| Link Distance (ft) | | 626 | | | 521 | | | 1426 | | | 728 | |
| Travel Time (s) | | 9.5 | | | 7.9 | | | 24.3 | | | 12.4 | |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.90 | 0.90 | 0.90 | 0.91 | 0.91 | 0.91 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 38 | 1896 | 224 | 513 | 2066 | 218 | 131 | 196 | 471 | 134 | 433 | 30 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 38 | 2120 | 0 | 513 | 2066 | 218 | 131 | 196 | 471 | 134 | 463 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 2.17 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | pm+ov | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | 8 | | | 2 | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | |
| Minimum Split (s) | 10.0 | 35.0 | | 10.0 | 42.0 | 10.0 | 10.0 | 42.0 | 42.0 | 10.0 | 40.0 | |
| Total Split (s) | 10.0 | 42.0 | | 23.0 | 55.0 | 13.0 | 13.0 | 42.0 | 42.0 | 13.0 | 42.0 | |
| Total Split (%) | 8.3% | 35.0% | | 19.2% | 45.8% | 10.8% | 10.8% | 35.0% | 35.0% | 10.8% | 35.0% | |
| Maximum Green (s) | 6.0 | 37.0 | | 19.0 | 50.0 | 9.0 | 9.0 | 37.0 | 37.0 | 9.0 | 37.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | |
| Lead/Lag | Lag | Lag | | Lead | Lead | Lag | Lag | Lead | Lead | Lag | Lead | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | C-Max | | None | C-Max | None | None | Max | Max | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | 7.0 | | 7.0 | |
| Flash Dont Walk (s) | | 23.0 | | | 30.0 | | | 30.0 | 30.0 | | 28.0 | |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | | | 2 | 2 | | 2 | |
| Act Effct Green (s) | 6.0 | 37.0 | | 19.0 | 54.0 | 68.0 | 9.0 | 37.0 | 37.0 | 9.0 | 37.0 | |
| Actuated g/C Ratio | 0.05 | 0.31 | | 0.16 | 0.45 | 0.57 | 0.08 | 0.31 | 0.31 | 0.08 | 0.31 | |
| v/c Ratio | 0.23 | 1.14 | | 1.00 | 0.95 | 0.23 | 0.54 | 0.19 | 0.66 | 0.99 | 0.45 | |
| Control Delay | 38.6 | 91.2 | | 77.6 | 42.8 | 5.2 | 62.2 | 31.1 | 13.5 | 118.1 | 16.0 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 8.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 38.6 | 91.2 | | 77.6 | 51.7 | 5.2 | 62.2 | 31.1 | 13.5 | 118.1 | 16.0 | |
| LOS | D | F | | E | D | A | E | C | B | F | B | |
| Approach Delay | | 90.2 | | | 52.8 | | | 25.8 | | | 38.9 | |
| Approach LOS | | F | | | D | | | C | | | D | |
| Queue Length 50th (ft) | 12 | ~537 | | 199 | ~633 | 23 | 51 | 58 | 64 | 56 | 58 | |
| Queue Length 95th (ft) | m18 | #615 | | m#276 | m#731 | m34 | 85 | 89 | 188 | #126 | 87 | |
| Internal Link Dist (ft) | | 546 | | | 441 | | | 1346 | | | 648 | |
| Turn Bay Length (ft) | 180 | | | 325 | | 250 | 150 | | 200 | 260 | | |
| Base Capacity (vph) | 162 | 1858 | | 514 | 2168 | 938 | 243 | 1033 | 712 | 135 | 1027 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 120 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.23 | 1.14 | | 1.00 | 1.01 | 0.23 | 0.54 | 0.19 | 0.66 | 0.99 | 0.45 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 45 (38%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow | | | |
| Natural Cycle: 115 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 1.14 | | | |
| Intersection Signal Delay: 60.8 | | Intersection LOS: E | |
| Intersection Capacity Utilization 76.7% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

~ Volume exceeds capacity, queue is theoretically infinite.

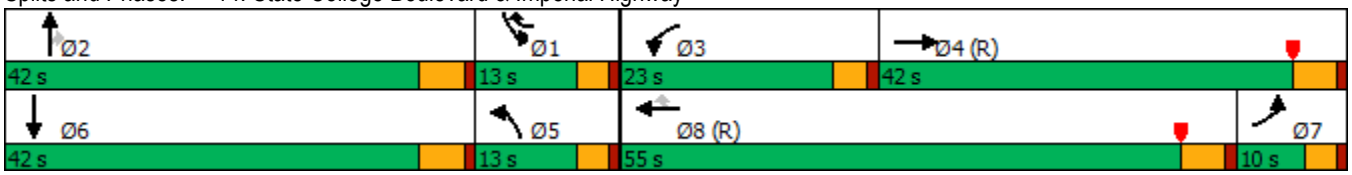
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: State College Boulevard & Imperial Highway



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 320 | 1807 | 45 | 73 | 2051 | 368 | 58 | 39 | 69 | 352 | 30 | 239 |
| Future Volume (vph) | 320 | 1807 | 45 | 73 | 2051 | 368 | 58 | 39 | 69 | 352 | 30 | 239 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (ft) | 165 | | 0 | 190 | | 310 | 0 | | 0 | 160 | | 0 |
| Storage Lanes | 2 | | 0 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.91 | 0.91 | 1.00 | 0.91 | 1.00 | 0.91 | 0.91 | 0.95 | 0.97 | 1.00 | 1.00 |
| Frt | | 0.996 | | | | 0.850 | | 0.909 | | | 0.867 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | 0.997 | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 4798 | 0 | 1676 | 4818 | 1500 | 1526 | 2911 | 0 | 3252 | 1530 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | 0.997 | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 4798 | 0 | 1676 | 4818 | 1500 | 1526 | 2911 | 0 | 3252 | 1530 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 4 | | | | 328 | | 78 | | | 145 | |
| Link Speed (mph) | | 45 | | | 45 | | | 30 | | | 40 | |
| Link Distance (ft) | | 3572 | | | 626 | | | 275 | | | 499 | |
| Travel Time (s) | | 54.1 | | | 9.5 | | | 6.3 | | | 8.5 | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.89 | 0.89 | 0.89 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 337 | 1902 | 47 | 77 | 2159 | 387 | 65 | 44 | 78 | 400 | 34 | 272 |
| Shared Lane Traffic (%) | | | | | | | 10% | | | | | |
| Lane Group Flow (vph) | 337 | 1949 | 0 | 77 | 2159 | 387 | 58 | 129 | 0 | 400 | 306 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | Perm | Split | NA | | Split | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | | | | 8 | | | | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Minimum Split (s) | 10.0 | 40.0 | | 10.0 | 41.0 | 41.0 | 11.0 | 11.0 | | 41.0 | 41.0 | |
| Total Split (s) | 15.0 | 57.0 | | 11.0 | 53.0 | 53.0 | 11.0 | 11.0 | | 41.0 | 41.0 | |
| Total Split (%) | 12.5% | 47.5% | | 9.2% | 44.2% | 44.2% | 9.2% | 9.2% | | 34.2% | 34.2% | |
| Maximum Green (s) | 11.0 | 52.0 | | 7.0 | 48.0 | 48.0 | 6.0 | 6.0 | | 36.0 | 36.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lag | Lead | | Lag | Lead | Lead | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | C-Max | | None | C-Max | C-Max | Max | Max | | Max | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | | 28.0 | | | 29.0 | 29.0 | | | | 29.0 | 29.0 | |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | 2 | | | | 2 | 2 | |
| Act Effct Green (s) | 11.0 | 52.0 | | 7.0 | 48.0 | 48.0 | 6.0 | 6.0 | | 36.0 | 36.0 | |
| Actuated g/C Ratio | 0.09 | 0.43 | | 0.06 | 0.40 | 0.40 | 0.05 | 0.05 | | 0.30 | 0.30 | |
| v/c Ratio | 1.13 | 0.94 | | 0.79 | 1.12 | 0.49 | 0.76 | 0.59 | | 0.41 | 0.55 | |
| Control Delay | 107.2 | 10.1 | | 42.6 | 75.1 | 1.8 | 108.5 | 35.8 | | 33.3 | 23.7 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 107.2 | 10.1 | | 42.6 | 75.1 | 1.8 | 108.5 | 35.8 | | 33.3 | 23.7 | |
| LOS | F | B | | D | E | A | F | D | | C | C | |
| Approach Delay | | 24.4 | | | 63.3 | | | 58.3 | | | 29.1 | |
| Approach LOS | | C | | | E | | | E | | | C | |
| Queue Length 50th (ft) | ~160 | 125 | | 63 | ~682 | 18 | 49 | 21 | | 111 | 81 | |
| Queue Length 95th (ft) | m#162 | m123 | | m57 | m219 | m14 | #132 | 54 | | 218 | 261 | |
| Internal Link Dist (ft) | | 3492 | | | 546 | | | 195 | | | 419 | |
| Turn Bay Length (ft) | 165 | | | 190 | | 310 | | | | 160 | | |
| Base Capacity (vph) | 298 | 2081 | | 97 | 1927 | 796 | 76 | 219 | | 975 | 560 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 7 | 0 | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 1.13 | 0.94 | | 0.79 | 1.12 | 0.49 | 0.76 | 0.59 | | 0.41 | 0.55 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 68 (57%), Referenced to phase 4:EBT and 8:WBT, Start of Green | | | |
| Natural Cycle: 115 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 1.13 | | | |
| Intersection Signal Delay: 43.7 | | Intersection LOS: D | |
| Intersection Capacity Utilization 89.5% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

~ Volume exceeds capacity, queue is theoretically infinite.

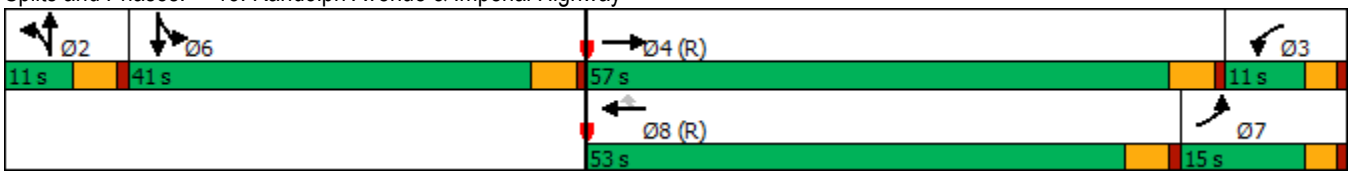
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Randolph Avenue & Imperial Highway



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 112 | 1991 | 116 | 474 | 2019 | 574 | 391 | 625 | 370 | 463 | 323 | 98 |
| Future Volume (vph) | 112 | 1991 | 116 | 474 | 2019 | 574 | 391 | 625 | 370 | 463 | 323 | 98 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1000 | 1800 | 1800 |
| Storage Length (ft) | 180 | | 290 | 325 | | 250 | 150 | | 200 | 260 | | 0 |
| Storage Lanes | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | | 0 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.86 | 0.86 | 0.97 | 0.91 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 0.95 |
| Frt | | 0.992 | | | | 0.850 | | | 0.850 | | 0.965 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 6022 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 1807 | 3236 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 6022 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 1807 | 3236 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 10 | | | | 109 | | | 201 | | 34 | |
| Link Speed (mph) | | 45 | | | 45 | | | 40 | | | 40 | |
| Link Distance (ft) | | 626 | | | 521 | | | 1426 | | | 728 | |
| Travel Time (s) | | 9.5 | | | 7.9 | | | 24.3 | | | 12.4 | |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 117 | 2074 | 121 | 494 | 2103 | 598 | 434 | 694 | 411 | 514 | 359 | 109 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 117 | 2195 | 0 | 494 | 2103 | 598 | 434 | 694 | 411 | 514 | 468 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 2.17 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | pm+ov | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | 8 | | | 2 | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | |
| Minimum Split (s) | 10.0 | 35.0 | | 10.0 | 42.0 | 10.0 | 10.0 | 42.0 | 42.0 | 10.0 | 40.0 | |
| Total Split (s) | 10.0 | 44.0 | | 15.0 | 49.0 | 19.0 | 21.0 | 42.0 | 42.0 | 19.0 | 40.0 | |
| Total Split (%) | 8.3% | 36.7% | | 12.5% | 40.8% | 15.8% | 17.5% | 35.0% | 35.0% | 15.8% | 33.3% | |
| Maximum Green (s) | 6.0 | 39.0 | | 11.0 | 44.0 | 15.0 | 17.0 | 37.0 | 37.0 | 15.0 | 35.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | |
| Lead/Lag | Lag | Lag | | Lead | Lead | Lead | Lag | Lag | Lag | Lead | Lead | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | C-Max | | None | C-Max | None | None | Max | Max | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | 7.0 | | 7.0 | |
| Flash Dont Walk (s) | | 23.0 | | | 30.0 | | | 30.0 | 30.0 | | 28.0 | |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | | | 2 | 2 | | 2 | |
| Act Effct Green (s) | 6.0 | 39.0 | | 11.0 | 44.0 | 60.0 | 17.0 | 37.0 | 37.0 | 15.0 | 35.0 | |
| Actuated g/C Ratio | 0.05 | 0.32 | | 0.09 | 0.37 | 0.50 | 0.14 | 0.31 | 0.31 | 0.12 | 0.29 | |
| v/c Ratio | 0.72 | 1.12 | | 1.66 | 1.19 | 0.74 | 0.94 | 0.67 | 0.68 | 2.28 | 0.48 | |
| Control Delay | 50.1 | 78.7 | | 334.4 | 123.6 | 13.0 | 81.3 | 40.1 | 24.6 | 611.6 | 31.9 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 50.1 | 78.7 | | 334.4 | 124.3 | 13.0 | 81.3 | 40.1 | 24.6 | 611.6 | 31.9 | |
| LOS | D | E | | F | F | B | F | D | C | F | C | |
| Approach Delay | | 77.2 | | | 135.9 | | | 47.5 | | | 335.3 | |
| Approach LOS | | E | | | F | | | D | | | F | |
| Queue Length 50th (ft) | 44 | ~556 | | ~285 | ~730 | 208 | 173 | 246 | 144 | ~342 | 176 | |
| Queue Length 95th (ft) | m52 | m#625 | | m#296 | m#752 | m236 | #273 | 314 | 265 | #451 | 235 | |
| Internal Link Dist (ft) | | 546 | | | 441 | | | 1346 | | | 648 | |
| Turn Bay Length (ft) | 180 | | | 325 | | 250 | 150 | | 200 | 260 | | |
| Base Capacity (vph) | 162 | 1963 | | 298 | 1766 | 804 | 460 | 1033 | 601 | 225 | 967 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 325 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.72 | 1.12 | | 1.66 | 1.46 | 0.74 | 0.94 | 0.67 | 0.68 | 2.28 | 0.48 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 116 (97%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow | | | |
| Natural Cycle: 115 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 2.28 | | | |
| Intersection Signal Delay: 126.5 | | Intersection LOS: F | |
| Intersection Capacity Utilization 105.1% | | ICU Level of Service G | |
| Analysis Period (min) 15 | | | |

~ Volume exceeds capacity, queue is theoretically infinite.

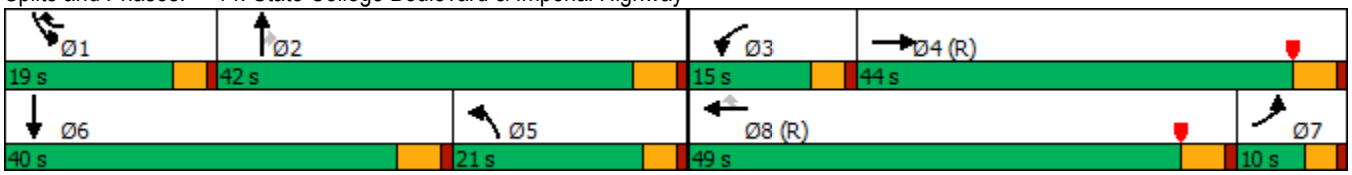
Queue shown is maximum after two cycles.

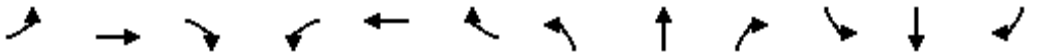
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

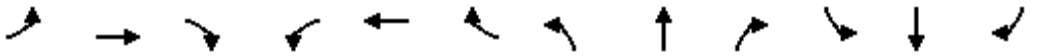
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: State College Boulevard & Imperial Highway





| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 344 | 1626 | 65 | 142 | 1880 | 496 | 102 | 47 | 199 | 446 | 86 | 352 |
| Future Volume (vph) | 344 | 1626 | 65 | 142 | 1880 | 496 | 102 | 47 | 199 | 446 | 86 | 352 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (ft) | 165 | | 0 | 190 | | 310 | 0 | | 0 | 160 | | 0 |
| Storage Lanes | 2 | | 0 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.91 | 0.91 | 1.00 | 0.91 | 1.00 | 0.91 | 0.91 | 0.95 | 0.97 | 1.00 | 1.00 |
| Frt | | 0.994 | | | | 0.850 | | 0.883 | | | 0.880 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | 0.998 | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 4789 | 0 | 1676 | 4818 | 1500 | 1526 | 2830 | 0 | 3252 | 1553 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | 0.998 | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 4789 | 0 | 1676 | 4818 | 1500 | 1526 | 2830 | 0 | 3252 | 1553 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 6 | | | | 463 | | 180 | | | 175 | |
| Link Speed (mph) | | 45 | | | 45 | | | 30 | | | 40 | |
| Link Distance (ft) | | 3572 | | | 626 | | | 275 | | | 499 | |
| Travel Time (s) | | 54.1 | | | 9.5 | | | 6.3 | | | 8.5 | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.98 | 0.98 | 0.98 | 0.83 | 0.83 | 0.83 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 366 | 1730 | 69 | 145 | 1918 | 506 | 123 | 57 | 240 | 496 | 96 | 391 |
| Shared Lane Traffic (%) | | | | | | | 10% | | | | | |
| Lane Group Flow (vph) | 366 | 1799 | 0 | 145 | 1918 | 506 | 111 | 309 | 0 | 496 | 487 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | Perm | Split | NA | | Split | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | | | | 8 | | | | | | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Minimum Split (s) | 10.0 | 40.0 | | 10.0 | 41.0 | 41.0 | 11.0 | 11.0 | | 41.0 | 41.0 | |
| Total Split (s) | 17.0 | 52.0 | | 15.0 | 50.0 | 50.0 | 12.0 | 12.0 | | 41.0 | 41.0 | |
| Total Split (%) | 14.2% | 43.3% | | 12.5% | 41.7% | 41.7% | 10.0% | 10.0% | | 34.2% | 34.2% | |
| Maximum Green (s) | 13.0 | 47.0 | | 11.0 | 45.0 | 45.0 | 7.0 | 7.0 | | 36.0 | 36.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lag | Lead | | Lag | Lead | Lead | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | C-Max | | None | C-Max | C-Max | Max | Max | | Max | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | | 28.0 | | | 29.0 | 29.0 | | | | 29.0 | 29.0 | |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | 2 | | | | 2 | 2 | |
| Act Effct Green (s) | 13.0 | 47.0 | | 11.0 | 45.0 | 45.0 | 7.0 | 7.0 | | 36.0 | 36.0 | |
| Actuated g/C Ratio | 0.11 | 0.39 | | 0.09 | 0.38 | 0.38 | 0.06 | 0.06 | | 0.30 | 0.30 | |
| v/c Ratio | 1.04 | 0.96 | | 0.95 | 1.06 | 0.59 | 1.25 | 0.95dr | | 0.51 | 0.83 | |
| Control Delay | 67.8 | 11.7 | | 56.9 | 41.7 | 0.5 | 221.8 | 57.1 | | 36.9 | 38.0 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 67.8 | 11.7 | | 56.9 | 41.7 | 1.5 | 221.8 | 57.1 | | 36.9 | 38.0 | |
| LOS | E | B | | E | D | A | F | E | | D | D | |
| Approach Delay | | 21.2 | | | 34.6 | | | 100.7 | | | 37.5 | |
| Approach LOS | | C | | | C | | | F | | | D | |
| Queue Length 50th (ft) | ~162 | 172 | | 120 | ~576 | 5 | ~117 | 54 | | 163 | 236 | |
| Queue Length 95th (ft) | m#153 | m164 | | m106 | m99 | m0 | #224 | #118 | | 217 | #419 | |
| Internal Link Dist (ft) | | 3492 | | | 546 | | | 195 | | | 419 | |
| Turn Bay Length (ft) | 165 | | | 190 | | 310 | | | | 160 | | |
| Base Capacity (vph) | 352 | 1879 | | 153 | 1806 | 851 | 89 | 334 | | 975 | 588 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 148 | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 1.04 | 0.96 | | 0.95 | 1.06 | 0.72 | 1.25 | 0.93 | | 0.51 | 0.83 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 114 (95%), Referenced to phase 4:EBT and 8:WBT, Start of Green | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.25 | |
| Intersection Signal Delay: 34.9 | Intersection LOS: C |
| Intersection Capacity Utilization 99.7% | ICU Level of Service F |
| Analysis Period (min) 15 | |

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

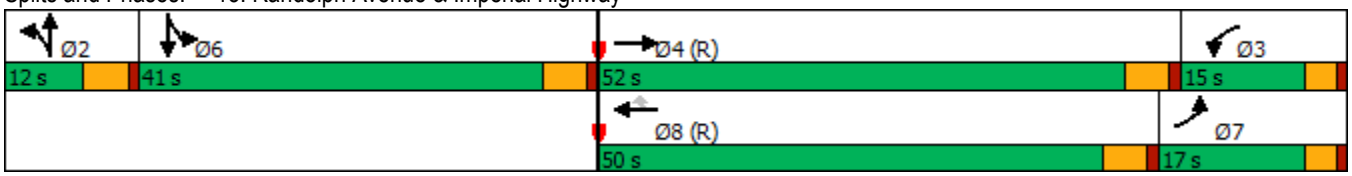
\# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

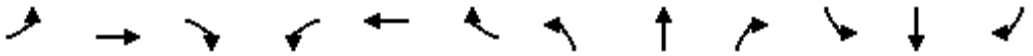
m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 13: Randolph Avenue & Imperial Highway



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 139 | 1695 | 233 | 684 | 2092 | 991 | 331 | 564 | 607 | 655 | 443 | 186 |
| Future Volume (vph) | 139 | 1695 | 233 | 684 | 2092 | 991 | 331 | 564 | 607 | 655 | 443 | 186 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1000 | 1800 | 1800 |
| Storage Length (ft) | 180 | | 290 | 325 | | 250 | 150 | | 200 | 260 | | 0 |
| Storage Lanes | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | | 0 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.86 | 0.86 | 0.97 | 0.91 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 0.95 |
| Frt | | 0.982 | | | | 0.850 | | | 0.850 | | 0.956 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 5961 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 1807 | 3205 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 5961 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 1807 | 3205 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 30 | | | | 93 | | | 207 | | 54 | |
| Link Speed (mph) | | 45 | | | 45 | | | 40 | | | 40 | |
| Link Distance (ft) | | 626 | | | 521 | | | 1426 | | | 728 | |
| Travel Time (s) | | 9.5 | | | 7.9 | | | 24.3 | | | 12.4 | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.92 | 0.92 | 0.92 | 0.98 | 0.98 | 0.98 | 0.83 | 0.83 | 0.83 |
| Adj. Flow (vph) | 149 | 1823 | 251 | 743 | 2274 | 1077 | 338 | 576 | 619 | 789 | 534 | 224 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 149 | 2074 | 0 | 743 | 2274 | 1077 | 338 | 576 | 619 | 789 | 758 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 2.17 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | pm+ov | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | 8 | | | 2 | | | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | |
| Minimum Split (s) | 10.0 | 35.0 | | 10.0 | 42.0 | 10.0 | 10.0 | 42.0 | 42.0 | 10.0 | 40.0 | |
| Total Split (s) | 10.0 | 43.0 | | 15.0 | 48.0 | 18.0 | 22.0 | 44.0 | 44.0 | 18.0 | 40.0 | |
| Total Split (%) | 8.3% | 35.8% | | 12.5% | 40.0% | 15.0% | 18.3% | 36.7% | 36.7% | 15.0% | 33.3% | |
| Maximum Green (s) | 6.0 | 38.0 | | 11.0 | 43.0 | 14.0 | 18.0 | 39.0 | 39.0 | 14.0 | 35.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | |
| Lead/Lag | Lag | Lag | | Lead | Lead | Lag | Lag | Lead | Lead | Lag | Lead | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | C-Max | | None | C-Max | None | None | Max | Max | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | 7.0 | | 7.0 | |
| Flash Dont Walk (s) | | 23.0 | | | 30.0 | | | 30.0 | 30.0 | | 28.0 | |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | | | 2 | 2 | | 2 | |
| Act Effct Green (s) | 6.0 | 38.0 | | 11.0 | 43.0 | 62.0 | 18.0 | 39.0 | 39.0 | 14.0 | 35.0 | |
| Actuated g/C Ratio | 0.05 | 0.32 | | 0.09 | 0.36 | 0.52 | 0.15 | 0.32 | 0.32 | 0.12 | 0.29 | |
| v/c Ratio | 0.92 | 1.09 | | 2.49 | 1.32 | 1.32 | 0.69 | 0.53 | 0.99 | 3.76 | 0.78 | |
| Control Delay | 76.5 | 70.6 | | 699.0 | 177.6 | 170.1 | 56.7 | 35.2 | 60.4 | 1267.8 | 42.6 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 76.5 | 70.6 | | 699.0 | 177.9 | 170.1 | 56.7 | 35.2 | 60.4 | 1267.8 | 42.6 | |
| LOS | E | E | | F | F | F | E | D | E | F | D | |
| Approach Delay | | 71.0 | | | 270.4 | | | 50.1 | | | 667.5 | |
| Approach LOS | | E | | | F | | | D | | | F | |
| Queue Length 50th (ft) | 56 | ~506 | | ~507 | ~832 | ~1038 | 129 | 191 | 351 | ~568 | 264 | |
| Queue Length 95th (ft) | m#73 | m#560 | | m#460 | m#709 | m#895 | 181 | 248 | #605 | #630 | 303 | |
| Internal Link Dist (ft) | | 546 | | | 441 | | | 1346 | | | 648 | |
| Turn Bay Length (ft) | 180 | | | 325 | | 250 | 150 | | 200 | 260 | | |
| Base Capacity (vph) | 162 | 1908 | | 298 | 1726 | 819 | 487 | 1089 | 627 | 210 | 973 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 149 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.92 | 1.09 | | 2.49 | 1.44 | 1.32 | 0.69 | 0.53 | 0.99 | 3.76 | 0.78 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 30 (25%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow | | | |
| Natural Cycle: 115 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 3.76 | | | |
| Intersection Signal Delay: 252.7 | | Intersection LOS: F | |
| Intersection Capacity Utilization 117.6% | | ICU Level of Service H | |
| Analysis Period (min) 15 | | | |

~ Volume exceeds capacity, queue is theoretically infinite.

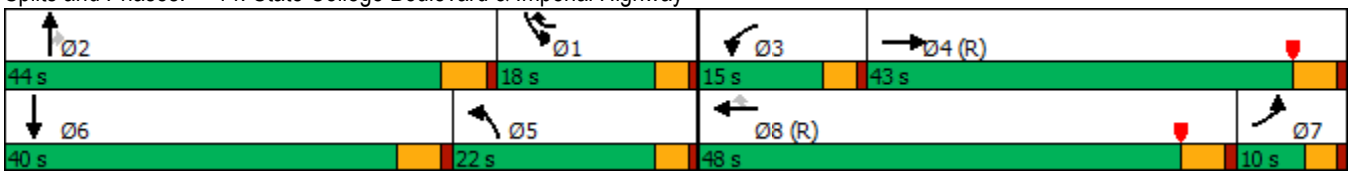
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

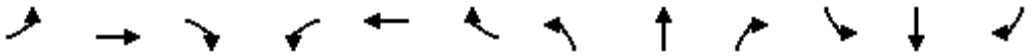
Splits and Phases: 14: State College Boulevard & Imperial Highway



*APPENDIX F-III*

# YEAR 2026 PLUS PROJECT WITH IMPROVEMENTS TRAFFIC CONDITIONS

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 35 | 1725 | 204 | 462 | 1859 | 196 | 119 | 178 | 429 | 126 | 407 | 28 |
| Future Volume (vph) | 35 | 1725 | 204 | 462 | 1859 | 196 | 119 | 178 | 429 | 126 | 407 | 28 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (ft) | 180 | | 290 | 325 | | 250 | 150 | | 200 | 260 | | 275 |
| Storage Lanes | 2 | | 1 | 2 | | 1 | 2 | | 1 | 1 | | 1 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.86 | 0.86 | 0.97 | 0.91 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.984 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 5973 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 3252 | 3353 | 1500 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 5973 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 3252 | 3353 | 1500 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 25 | | | | 204 | | | 361 | | | 136 |
| Link Speed (mph) | | 45 | | | 45 | | | 40 | | | 40 | |
| Link Distance (ft) | | 626 | | | 521 | | | 1426 | | | 728 | |
| Travel Time (s) | | 9.5 | | | 7.9 | | | 24.3 | | | 12.4 | |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.90 | 0.90 | 0.90 | 0.91 | 0.91 | 0.91 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 38 | 1896 | 224 | 513 | 2066 | 218 | 131 | 196 | 471 | 134 | 433 | 30 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 38 | 2120 | 0 | 513 | 2066 | 218 | 131 | 196 | 471 | 134 | 433 | 30 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 36 | | | 36 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | pm+ov | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | 8 | | | 2 | | | 6 |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Minimum Split (s) | 10.0 | 35.0 | | 10.0 | 42.0 | 10.0 | 10.0 | 42.0 | 42.0 | 10.0 | 40.0 | 40.0 |
| Total Split (s) | 10.0 | 42.0 | | 23.0 | 55.0 | 13.0 | 13.0 | 42.0 | 42.0 | 13.0 | 42.0 | 42.0 |
| Total Split (%) | 8.3% | 35.0% | | 19.2% | 45.8% | 10.8% | 10.8% | 35.0% | 35.0% | 10.8% | 35.0% | 35.0% |
| Maximum Green (s) | 6.0 | 37.0 | | 19.0 | 50.0 | 9.0 | 9.0 | 37.0 | 37.0 | 9.0 | 37.0 | 37.0 |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | 5.0 |
| Lead/Lag | Lag | Lag | | Lead | Lead | Lag | Lag | Lead | Lead | Lag | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | C-Max | | None | C-Max | None | None | Max | Max | None | Max | Max |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | 7.0 | | 7.0 | 7.0 |
| Flash Dont Walk (s) | | 23.0 | | | 30.0 | | | 30.0 | 30.0 | | 28.0 | 28.0 |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | | | 2 | 2 | | 2 | 2 |
| Act Effct Green (s) | 6.0 | 37.0 | | 19.3 | 54.3 | 68.0 | 8.7 | 37.0 | 37.0 | 8.7 | 37.0 | 37.0 |
| Actuated g/C Ratio | 0.05 | 0.31 | | 0.16 | 0.45 | 0.57 | 0.07 | 0.31 | 0.31 | 0.07 | 0.31 | 0.31 |
| v/c Ratio | 0.23 | 1.14 | | 0.98 | 0.95 | 0.23 | 0.56 | 0.19 | 0.66 | 0.57 | 0.42 | 0.05 |
| Control Delay | 38.6 | 91.2 | | 73.4 | 42.0 | 5.2 | 63.3 | 31.1 | 13.5 | 49.1 | 16.2 | 0.2 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 7.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 38.6 | 91.2 | | 73.4 | 49.6 | 5.2 | 63.3 | 31.1 | 13.5 | 49.1 | 16.2 | 0.2 |
| LOS | D | F | | E | D | A | E | C | B | D | B | A |
| Approach Delay | | 90.2 | | | 50.5 | | | 26.0 | | | 22.8 | |
| Approach LOS | | F | | | D | | | C | | | C | |
| Queue Length 50th (ft) | 12 | ~537 | | 199 | ~633 | 23 | 51 | 58 | 64 | 55 | 56 | 0 |
| Queue Length 95th (ft) | m18 | #615 | | m#276 | m#731 | m34 | 85 | 89 | 188 | 91 | 84 | 1 |
| Internal Link Dist (ft) | | 546 | | | 441 | | | 1346 | | | 648 | |
| Turn Bay Length (ft) | 180 | | | 325 | | 250 | 150 | | 200 | 260 | | 275 |
| Base Capacity (vph) | 162 | 1858 | | 523 | 2181 | 933 | 243 | 1033 | 712 | 243 | 1033 | 556 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 120 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.23 | 1.14 | | 0.98 | 1.00 | 0.23 | 0.54 | 0.19 | 0.66 | 0.55 | 0.42 | 0.05 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 45 (38%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow | | | |
| Natural Cycle: 115 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 1.14 | | | |
| Intersection Signal Delay: 58.3 | | Intersection LOS: E | |
| Intersection Capacity Utilization 75.8% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

~ Volume exceeds capacity, queue is theoretically infinite.

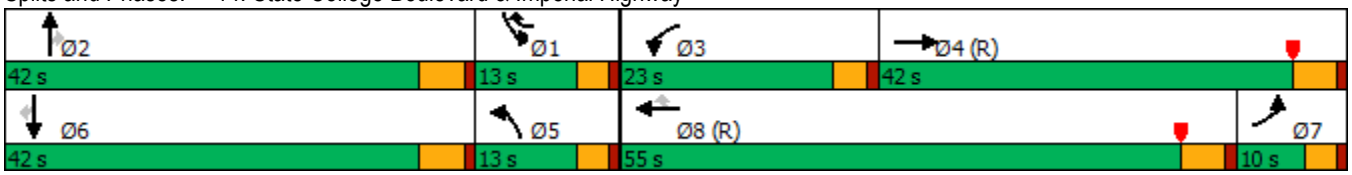
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: State College Boulevard & Imperial Highway



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 112 | 1991 | 116 | 474 | 2019 | 574 | 391 | 625 | 370 | 463 | 323 | 98 |
| Future Volume (vph) | 112 | 1991 | 116 | 474 | 2019 | 574 | 391 | 625 | 370 | 463 | 323 | 98 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (ft) | 180 | | 290 | 325 | | 250 | 150 | | 200 | 260 | | 275 |
| Storage Lanes | 2 | | 1 | 2 | | 1 | 2 | | 1 | 1 | | 1 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.86 | 0.86 | 0.97 | 0.91 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.992 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 6022 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 3252 | 3353 | 1500 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 6022 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 3252 | 3353 | 1500 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 10 | | | | 109 | | | 201 | | | 145 |
| Link Speed (mph) | | 45 | | | 45 | | | 40 | | | 40 | |
| Link Distance (ft) | | 626 | | | 521 | | | 1426 | | | 728 | |
| Travel Time (s) | | 9.5 | | | 7.9 | | | 24.3 | | | 12.4 | |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 117 | 2074 | 121 | 494 | 2103 | 598 | 434 | 694 | 411 | 514 | 359 | 109 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 117 | 2195 | 0 | 494 | 2103 | 598 | 434 | 694 | 411 | 514 | 359 | 109 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 36 | | | 36 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | pm+ov | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | 8 | | | 2 | | | 6 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Minimum Split (s) | 10.0 | 35.0 | | 10.0 | 42.0 | 10.0 | 10.0 | 42.0 | 42.0 | 10.0 | 40.0 | 40.0 |
| Total Split (s) | 10.0 | 44.0 | | 15.0 | 49.0 | 19.0 | 21.0 | 42.0 | 42.0 | 19.0 | 40.0 | 40.0 |
| Total Split (%) | 8.3% | 36.7% | | 12.5% | 40.8% | 15.8% | 17.5% | 35.0% | 35.0% | 15.8% | 33.3% | 33.3% |
| Maximum Green (s) | 6.0 | 39.0 | | 11.0 | 44.0 | 15.0 | 17.0 | 37.0 | 37.0 | 15.0 | 35.0 | 35.0 |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | 5.0 |
| Lead/Lag | Lag | Lag | | Lead | Lead | Lead | Lag | Lag | Lag | Lead | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | C-Max | | None | C-Max | None | None | Max | Max | None | Max | Max |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | 7.0 | | 7.0 | 7.0 |
| Flash Dont Walk (s) | | 23.0 | | | 30.0 | | | 30.0 | 30.0 | | 28.0 | 28.0 |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | | | 2 | 2 | | 2 | 2 |
| Act Effct Green (s) | 6.0 | 39.0 | | 11.0 | 44.0 | 60.0 | 17.0 | 37.0 | 37.0 | 15.0 | 35.0 | 35.0 |
| Actuated g/C Ratio | 0.05 | 0.32 | | 0.09 | 0.37 | 0.50 | 0.14 | 0.31 | 0.31 | 0.12 | 0.29 | 0.29 |
| v/c Ratio | 0.72 | 1.12 | | 1.66 | 1.19 | 0.74 | 0.94 | 0.67 | 0.68 | 1.27 | 0.37 | 0.20 |
| Control Delay | 50.1 | 78.7 | | 334.4 | 123.6 | 13.0 | 81.3 | 40.1 | 24.6 | 169.7 | 32.5 | 6.1 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 50.1 | 78.7 | | 334.4 | 124.2 | 13.0 | 81.3 | 40.1 | 24.6 | 169.7 | 32.5 | 6.1 |
| LOS | D | E | | F | F | B | F | D | C | F | C | A |
| Approach Delay | | 77.2 | | | 135.9 | | | 47.5 | | | 101.4 | |
| Approach LOS | | E | | | F | | | D | | | F | |
| Queue Length 50th (ft) | 44 | ~556 | | ~285 | ~730 | 208 | 173 | 246 | 144 | ~264 | 130 | 16 |
| Queue Length 95th (ft) | m52 | m#625 | | m#296 | m#752 | m236 | #273 | 314 | 265 | #373 | 186 | m35 |
| Internal Link Dist (ft) | | 546 | | | 441 | | | 1346 | | | 648 | |
| Turn Bay Length (ft) | 180 | | | 325 | | 250 | 150 | | 200 | 260 | | 275 |
| Base Capacity (vph) | 162 | 1963 | | 298 | 1766 | 804 | 460 | 1033 | 601 | 406 | 977 | 540 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 320 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.72 | 1.12 | | 1.66 | 1.45 | 0.74 | 0.94 | 0.67 | 0.68 | 1.27 | 0.37 | 0.21 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 116 (97%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow | | | |
| Natural Cycle: 115 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 1.66 | | | |
| Intersection Signal Delay: 97.8 | | Intersection LOS: F | |
| Intersection Capacity Utilization 93.9% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

~ Volume exceeds capacity, queue is theoretically infinite.

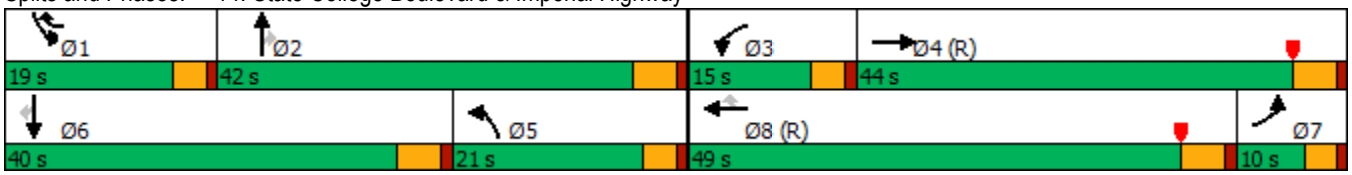
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: State College Boulevard & Imperial Highway



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 139 | 1695 | 233 | 684 | 2092 | 991 | 331 | 564 | 607 | 655 | 443 | 186 |
| Future Volume (vph) | 139 | 1695 | 233 | 684 | 2092 | 991 | 331 | 564 | 607 | 655 | 443 | 186 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (ft) | 180 | | 290 | 325 | | 250 | 150 | | 200 | 260 | | 275 |
| Storage Lanes | 2 | | 1 | 2 | | 1 | 2 | | 1 | 1 | | 1 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.86 | 0.86 | 0.97 | 0.91 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.982 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 5961 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 3252 | 3353 | 1500 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 5961 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 3252 | 3353 | 1500 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 30 | | | | 93 | | | 207 | | | 136 |
| Link Speed (mph) | | 45 | | | 45 | | | 40 | | | 40 | |
| Link Distance (ft) | | 626 | | | 521 | | | 1426 | | | 728 | |
| Travel Time (s) | | 9.5 | | | 7.9 | | | 24.3 | | | 12.4 | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.92 | 0.92 | 0.92 | 0.98 | 0.98 | 0.98 | 0.83 | 0.83 | 0.83 |
| Adj. Flow (vph) | 149 | 1823 | 251 | 743 | 2274 | 1077 | 338 | 576 | 619 | 789 | 534 | 224 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 149 | 2074 | 0 | 743 | 2274 | 1077 | 338 | 576 | 619 | 789 | 534 | 224 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 36 | | | 36 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | pm+ov | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | 8 | | | 2 | | | 6 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Minimum Split (s) | 10.0 | 35.0 | | 10.0 | 42.0 | 10.0 | 10.0 | 42.0 | 42.0 | 10.0 | 40.0 | 40.0 |
| Total Split (s) | 10.0 | 43.0 | | 15.0 | 48.0 | 18.0 | 22.0 | 44.0 | 44.0 | 18.0 | 40.0 | 40.0 |
| Total Split (%) | 8.3% | 35.8% | | 12.5% | 40.0% | 15.0% | 18.3% | 36.7% | 36.7% | 15.0% | 33.3% | 33.3% |
| Maximum Green (s) | 6.0 | 38.0 | | 11.0 | 43.0 | 14.0 | 18.0 | 39.0 | 39.0 | 14.0 | 35.0 | 35.0 |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | 5.0 |
| Lead/Lag | Lag | Lag | | Lead | Lead | Lag | Lag | Lead | Lead | Lag | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | C-Max | | None | C-Max | None | None | Max | Max | None | Max | Max |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | 7.0 | | 7.0 | 7.0 |
| Flash Dont Walk (s) | | 23.0 | | | 30.0 | | | 30.0 | 30.0 | | 28.0 | 28.0 |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | | | 2 | 2 | | 2 | 2 |
| Act Effct Green (s) | 6.0 | 38.0 | | 11.0 | 43.0 | 62.0 | 18.0 | 39.0 | 39.0 | 14.0 | 35.0 | 35.0 |
| Actuated g/C Ratio | 0.05 | 0.32 | | 0.09 | 0.36 | 0.52 | 0.15 | 0.32 | 0.32 | 0.12 | 0.29 | 0.29 |
| v/c Ratio | 0.92 | 1.09 | | 2.49 | 1.32 | 1.32 | 0.69 | 0.53 | 0.99 | 2.08 | 0.55 | 0.42 |
| Control Delay | 76.5 | 70.6 | | 699.0 | 177.6 | 170.1 | 56.7 | 35.2 | 60.4 | 523.0 | 38.3 | 16.1 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 76.5 | 70.6 | | 699.0 | 177.9 | 170.1 | 56.7 | 35.2 | 60.4 | 523.0 | 38.3 | 16.2 |
| LOS | E | E | | F | F | F | E | D | E | F | D | B |
| Approach Delay | | 71.0 | | | 270.4 | | | 50.1 | | | 282.3 | |
| Approach LOS | | E | | | F | | | D | | | F | |
| Queue Length 50th (ft) | 56 | ~506 | | ~507 | ~832 | ~1038 | 129 | 191 | 351 | ~497 | 183 | 51 |
| Queue Length 95th (ft) | m#73 | m#560 | | m#460 | m#709 | m#895 | 181 | 248 | #605 | #560 | 217 | 104 |
| Internal Link Dist (ft) | | 546 | | | 441 | | | 1346 | | | 648 | |
| Turn Bay Length (ft) | 180 | | | 325 | | 250 | 150 | | 200 | 260 | | 275 |
| Base Capacity (vph) | 162 | 1908 | | 298 | 1726 | 819 | 487 | 1089 | 627 | 379 | 977 | 533 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 148 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.92 | 1.09 | | 2.49 | 1.44 | 1.32 | 0.69 | 0.53 | 0.99 | 2.08 | 0.55 | 0.42 |

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 30 (25%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 2.49
Intersection Signal Delay: 189.3 Intersection LOS: F
Intersection Capacity Utilization 101.8% ICU Level of Service G
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

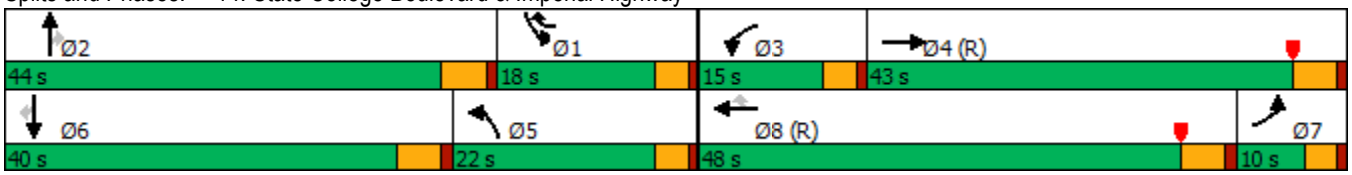
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

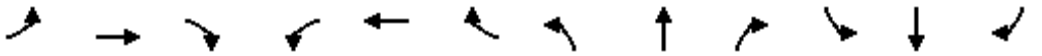
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: State College Boulevard & Imperial Highway

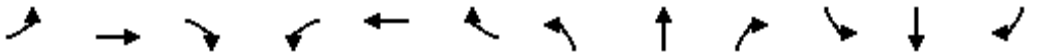


*APPENDIX F-IV*

# YEAR 2045 TRAFFIC CONDITIONS



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 96 | 1742 | 27 | 43 | 1882 | 164 | 39 | 20 | 71 | 140 | 22 | 41 |
| Future Volume (vph) | 96 | 1742 | 27 | 43 | 1882 | 164 | 39 | 20 | 71 | 140 | 22 | 41 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (ft) | 165 | | 0 | 190 | | 310 | 0 | | 0 | 160 | | 0 |
| Storage Lanes | 2 | | 0 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.91 | 0.91 | 1.00 | 0.91 | 1.00 | 0.91 | 0.91 | 0.95 | 0.97 | 1.00 | 1.00 |
| Frt | | 0.998 | | | | 0.850 | | 0.888 | | | 0.902 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | 0.998 | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 4808 | 0 | 1676 | 4818 | 1500 | 1526 | 2846 | 0 | 3252 | 1592 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | 0.998 | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 4808 | 0 | 1676 | 4818 | 1500 | 1526 | 2846 | 0 | 3252 | 1592 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 2 | | | | 164 | | 71 | | | 41 | |
| Link Speed (mph) | | 45 | | | 45 | | | 30 | | | 40 | |
| Link Distance (ft) | | 3572 | | | 626 | | | 275 | | | 499 | |
| Travel Time (s) | | 54.1 | | | 9.5 | | | 6.3 | | | 8.5 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 96 | 1742 | 27 | 43 | 1882 | 164 | 39 | 20 | 71 | 140 | 22 | 41 |
| Shared Lane Traffic (%) | | | | | | | 10% | | | | | |
| Lane Group Flow (vph) | 96 | 1769 | 0 | 43 | 1882 | 164 | 35 | 95 | 0 | 140 | 63 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | Perm | Split | NA | | Split | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | | | | 8 | | | | | | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Minimum Split (s) | 10.0 | 40.0 | | 10.0 | 41.0 | 41.0 | 11.0 | 11.0 | | 41.0 | 41.0 | |
| Total Split (s) | 11.0 | 58.0 | | 10.0 | 57.0 | 57.0 | 11.0 | 11.0 | | 41.0 | 41.0 | |
| Total Split (%) | 9.2% | 48.3% | | 8.3% | 47.5% | 47.5% | 9.2% | 9.2% | | 34.2% | 34.2% | |
| Maximum Green (s) | 7.0 | 53.0 | | 6.0 | 52.0 | 52.0 | 6.0 | 6.0 | | 36.0 | 36.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lag | Lead | | Lag | Lead | Lead | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | C-Max | | None | C-Max | C-Max | Max | Max | | Max | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | | 28.0 | | | 29.0 | 29.0 | | | | 29.0 | 29.0 | |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | 2 | | | | 2 | 2 | |
| Act Effct Green (s) | 6.9 | 54.9 | | 6.0 | 52.0 | 52.0 | 6.1 | 6.1 | | 36.0 | 36.0 | |
| Actuated g/C Ratio | 0.06 | 0.46 | | 0.05 | 0.43 | 0.43 | 0.05 | 0.05 | | 0.30 | 0.30 | |
| v/c Ratio | 0.52 | 0.80 | | 0.52 | 0.90 | 0.22 | 0.45 | 0.45 | | 0.14 | 0.12 | |
| Control Delay | 36.5 | 5.7 | | 87.9 | 43.9 | 11.6 | 74.1 | 26.4 | | 22.7 | 10.0 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 7.3 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 36.5 | 5.7 | | 87.9 | 51.2 | 11.6 | 74.1 | 26.4 | | 22.7 | 10.0 | |
| LOS | D | A | | F | D | B | E | C | | C | A | |
| Approach Delay | | 7.2 | | | 48.8 | | | 39.2 | | | 18.8 | |
| Approach LOS | | A | | | D | | | D | | | B | |
| Queue Length 50th (ft) | 41 | 42 | | 36 | 573 | 60 | 29 | 9 | | 32 | 6 | |
| Queue Length 95th (ft) | m45 | m48 | | m42 | 622 | m76 | #72 | 40 | | 66 | 52 | |
| Internal Link Dist (ft) | | 3492 | | | 546 | | | 195 | | | 419 | |
| Turn Bay Length (ft) | 165 | | | 190 | | 310 | | | | 160 | | |
| Base Capacity (vph) | 189 | 2199 | | 83 | 2087 | 742 | 77 | 212 | | 975 | 506 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 189 | 0 | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 0.51 | 0.80 | | 0.52 | 0.99 | 0.22 | 0.45 | 0.45 | | 0.14 | 0.12 | |

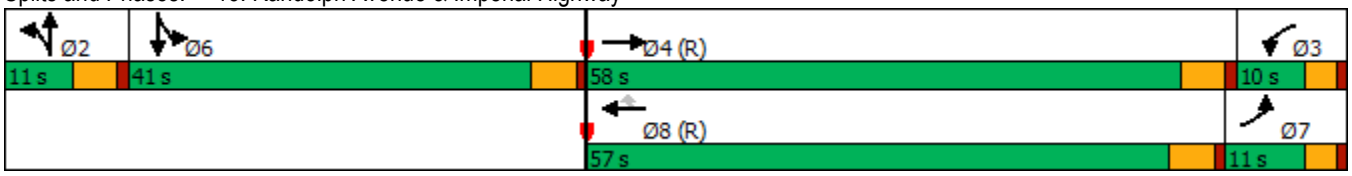
| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green | | | |
| Natural Cycle: 105 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.90 | | | |
| Intersection Signal Delay: 29.0 | | Intersection LOS: C | |
| Intersection Capacity Utilization 62.6% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |

# 95th percentile volume exceeds capacity, queue may be longer.

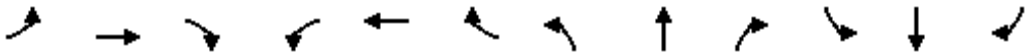
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Randolph Avenue & Imperial Highway



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 37 | 1734 | 204 | 534 | 1939 | 153 | 121 | 168 | 479 | 127 | 487 | 33 |
| Future Volume (vph) | 37 | 1734 | 204 | 534 | 1939 | 153 | 121 | 168 | 479 | 127 | 487 | 33 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1000 | 1800 | 1800 |
| Storage Length (ft) | 180 | | 290 | 325 | | 250 | 150 | | 200 | 260 | | 0 |
| Storage Lanes | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | | 0 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.86 | 0.86 | 0.97 | 0.91 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 0.95 |
| Frt | | 0.984 | | | | 0.850 | | | 0.850 | | 0.990 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 5973 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 1807 | 3319 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 5973 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 1807 | 3319 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 25 | | | | 152 | | | 363 | | 6 | |
| Link Speed (mph) | | 45 | | | 45 | | | 40 | | | 40 | |
| Link Distance (ft) | | 626 | | | 521 | | | 1426 | | | 728 | |
| Travel Time (s) | | 9.5 | | | 7.9 | | | 24.3 | | | 12.4 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 37 | 1734 | 204 | 534 | 1939 | 153 | 121 | 168 | 479 | 127 | 487 | 33 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 37 | 1938 | 0 | 534 | 1939 | 153 | 121 | 168 | 479 | 127 | 520 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 2.17 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | pm+ov | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | 8 | | | 2 | | | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | |
| Minimum Split (s) | 10.0 | 35.0 | | 10.0 | 42.0 | 10.0 | 10.0 | 42.0 | 42.0 | 10.0 | 40.0 | |
| Total Split (s) | 10.0 | 42.0 | | 23.0 | 55.0 | 13.0 | 13.0 | 42.0 | 42.0 | 13.0 | 42.0 | |
| Total Split (%) | 8.3% | 35.0% | | 19.2% | 45.8% | 10.8% | 10.8% | 35.0% | 35.0% | 10.8% | 35.0% | |
| Maximum Green (s) | 6.0 | 37.0 | | 19.0 | 50.0 | 9.0 | 9.0 | 37.0 | 37.0 | 9.0 | 37.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | |
| Lead/Lag | Lag | Lag | | Lead | Lead | Lag | Lag | Lead | Lead | Lag | Lead | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | C-Max | | None | C-Max | None | None | Max | Max | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | 7.0 | | 7.0 | |
| Flash Dont Walk (s) | | 23.0 | | | 30.0 | | | 30.0 | 30.0 | | 28.0 | |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | | | 2 | 2 | | 2 | |
| Act Effct Green (s) | 6.0 | 37.0 | | 19.0 | 54.0 | 68.0 | 9.0 | 37.0 | 37.0 | 9.0 | 37.0 | |
| Actuated g/C Ratio | 0.05 | 0.31 | | 0.16 | 0.45 | 0.57 | 0.08 | 0.31 | 0.31 | 0.08 | 0.31 | |
| v/c Ratio | 0.23 | 1.04 | | 1.04 | 0.89 | 0.17 | 0.50 | 0.16 | 0.67 | 0.94 | 0.51 | |
| Control Delay | 82.6 | 92.7 | | 86.1 | 37.5 | 4.2 | 60.8 | 30.8 | 14.0 | 148.4 | 59.0 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 1.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | |
| Total Delay | 82.6 | 92.7 | | 86.1 | 38.7 | 4.2 | 60.8 | 30.8 | 14.0 | 148.4 | 59.2 | |
| LOS | F | F | | F | D | A | E | C | B | F | E | |
| Approach Delay | | 92.5 | | | 46.3 | | | 25.0 | | | 76.7 | |
| Approach LOS | | F | | | D | | | C | | | E | |
| Queue Length 50th (ft) | 14 | ~480 | | ~237 | 528 | 12 | 47 | 50 | 69 | 53 | 216 | |
| Queue Length 95th (ft) | m21 | #559 | | m#303 | #638 | m15 | 79 | 78 | 195 | #118 | 275 | |
| Internal Link Dist (ft) | | 546 | | | 441 | | | 1346 | | | 648 | |
| Turn Bay Length (ft) | 180 | | | 325 | | 250 | 150 | | 200 | 260 | | |
| Base Capacity (vph) | 162 | 1858 | | 514 | 2168 | 915 | 243 | 1033 | 713 | 135 | 1027 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 86 | 0 | 0 | 0 | 0 | 0 | 104 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.23 | 1.04 | | 1.04 | 0.93 | 0.17 | 0.50 | 0.16 | 0.67 | 0.94 | 0.56 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow | | | |
| Natural Cycle: 115 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 1.04 | | | |
| Intersection Signal Delay: 62.0 | | Intersection LOS: E | |
| Intersection Capacity Utilization 81.5% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

~ Volume exceeds capacity, queue is theoretically infinite.

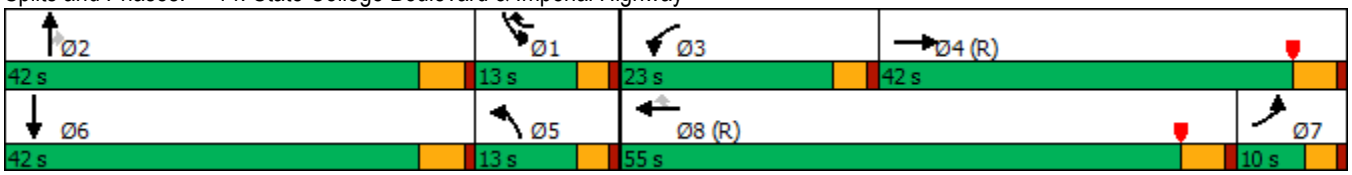
Queue shown is maximum after two cycles.

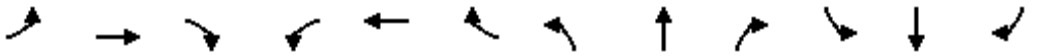
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

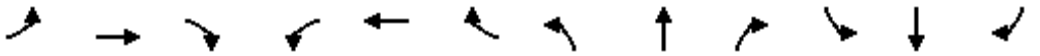
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: State College Boulevard & Imperial Highway





| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 270 | 1903 | 47 | 77 | 2114 | 356 | 61 | 41 | 72 | 350 | 32 | 230 |
| Future Volume (vph) | 270 | 1903 | 47 | 77 | 2114 | 356 | 61 | 41 | 72 | 350 | 32 | 230 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (ft) | 165 | | 0 | 190 | | 310 | 0 | | 0 | 160 | | 0 |
| Storage Lanes | 2 | | 0 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.91 | 0.91 | 1.00 | 0.91 | 1.00 | 0.91 | 0.91 | 0.95 | 0.97 | 1.00 | 1.00 |
| Frt | | 0.996 | | | | 0.850 | | 0.909 | | | 0.868 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | 0.997 | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 4798 | 0 | 1676 | 4818 | 1500 | 1526 | 2911 | 0 | 3252 | 1532 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | 0.997 | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 4798 | 0 | 1676 | 4818 | 1500 | 1526 | 2911 | 0 | 3252 | 1532 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 4 | | | | 308 | | 72 | | | 147 | |
| Link Speed (mph) | | 45 | | | 45 | | | 30 | | | 40 | |
| Link Distance (ft) | | 3572 | | | 626 | | | 275 | | | 499 | |
| Travel Time (s) | | 54.1 | | | 9.5 | | | 6.3 | | | 8.5 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 270 | 1903 | 47 | 77 | 2114 | 356 | 61 | 41 | 72 | 350 | 32 | 230 |
| Shared Lane Traffic (%) | | | | | | | 10% | | | | | |
| Lane Group Flow (vph) | 270 | 1950 | 0 | 77 | 2114 | 356 | 55 | 119 | 0 | 350 | 262 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | Perm | Split | NA | | Split | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | | | | 8 | | | | | | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Minimum Split (s) | 10.0 | 40.0 | | 10.0 | 41.0 | 41.0 | 11.0 | 11.0 | | 41.0 | 41.0 | |
| Total Split (s) | 15.0 | 57.0 | | 11.0 | 53.0 | 53.0 | 11.0 | 11.0 | | 41.0 | 41.0 | |
| Total Split (%) | 12.5% | 47.5% | | 9.2% | 44.2% | 44.2% | 9.2% | 9.2% | | 34.2% | 34.2% | |
| Maximum Green (s) | 11.0 | 52.0 | | 7.0 | 48.0 | 48.0 | 6.0 | 6.0 | | 36.0 | 36.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lag | Lead | | Lag | Lead | Lead | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | C-Max | | None | C-Max | C-Max | Max | Max | | Max | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | | 28.0 | | | 29.0 | 29.0 | | | | 29.0 | 29.0 | |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | 2 | | | | 2 | 2 | |
| Act Effct Green (s) | 11.0 | 52.0 | | 7.0 | 48.0 | 48.0 | 6.0 | 6.0 | | 36.0 | 36.0 | |
| Actuated g/C Ratio | 0.09 | 0.43 | | 0.06 | 0.40 | 0.40 | 0.05 | 0.05 | | 0.30 | 0.30 | |
| v/c Ratio | 0.91 | 0.94 | | 0.79 | 1.10 | 0.45 | 0.72 | 0.56 | | 0.36 | 0.47 | |
| Control Delay | 51.3 | 9.9 | | 42.4 | 64.4 | 1.7 | 102.3 | 35.1 | | 29.4 | 18.3 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 1.3 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 51.3 | 9.9 | | 42.4 | 65.7 | 1.7 | 102.3 | 35.1 | | 29.4 | 18.3 | |
| LOS | D | A | | D | E | A | F | D | | C | B | |
| Approach Delay | | 15.0 | | | 56.0 | | | 56.3 | | | 24.7 | |
| Approach LOS | | B | | | E | | | E | | | C | |
| Queue Length 50th (ft) | 115 | 122 | | 63 | ~656 | 16 | 47 | 19 | | 90 | 50 | |
| Queue Length 95th (ft) | m117 | m120 | | m61 | m216 | m14 | #127 | 52 | | 200 | 226 | |
| Internal Link Dist (ft) | | 3492 | | | 546 | | | 195 | | | 419 | |
| Turn Bay Length (ft) | 165 | | | 190 | | 310 | | | | 160 | | |
| Base Capacity (vph) | 298 | 2081 | | 97 | 1927 | 784 | 76 | 213 | | 975 | 562 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 6 | 0 | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 0.91 | 0.94 | | 0.79 | 1.10 | 0.45 | 0.72 | 0.56 | | 0.36 | 0.47 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 68 (57%), Referenced to phase 4:EBT and 8:WBT, Start of Green | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.10 | |
| Intersection Signal Delay: 36.2 | Intersection LOS: D |
| Intersection Capacity Utilization 88.8% | ICU Level of Service E |
| Analysis Period (min) 15 | |

~ Volume exceeds capacity, queue is theoretically infinite.

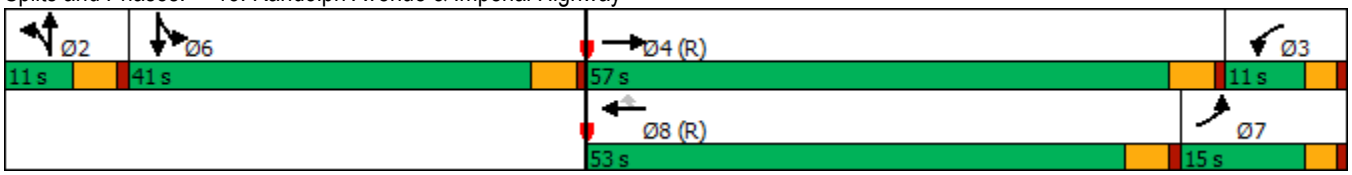
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

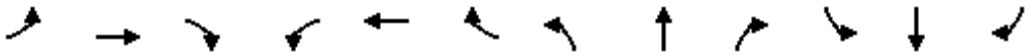
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Randolph Avenue & Imperial Highway



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 118 | 2080 | 118 | 497 | 2038 | 518 | 385 | 628 | 471 | 464 | 331 | 103 |
| Future Volume (vph) | 118 | 2080 | 118 | 497 | 2038 | 518 | 385 | 628 | 471 | 464 | 331 | 103 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1000 | 1800 | 1800 |
| Storage Length (ft) | 180 | | 290 | 325 | | 250 | 150 | | 200 | 260 | | 0 |
| Storage Lanes | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | | 0 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.86 | 0.86 | 0.97 | 0.91 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 0.95 |
| Frt | | 0.992 | | | | 0.850 | | | 0.850 | | 0.964 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 6022 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 1807 | 3232 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 6022 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 1807 | 3232 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 10 | | | | 109 | | | 202 | | 35 | |
| Link Speed (mph) | | 45 | | | 45 | | | 40 | | | 40 | |
| Link Distance (ft) | | 626 | | | 521 | | | 1426 | | | 728 | |
| Travel Time (s) | | 9.5 | | | 7.9 | | | 24.3 | | | 12.4 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 118 | 2080 | 118 | 497 | 2038 | 518 | 385 | 628 | 471 | 464 | 331 | 103 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 118 | 2198 | 0 | 497 | 2038 | 518 | 385 | 628 | 471 | 464 | 434 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 2.17 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | pm+ov | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | 8 | | | 2 | | | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | |
| Minimum Split (s) | 10.0 | 35.0 | | 10.0 | 42.0 | 10.0 | 10.0 | 42.0 | 42.0 | 10.0 | 40.0 | |
| Total Split (s) | 10.0 | 44.0 | | 15.0 | 49.0 | 19.0 | 21.0 | 42.0 | 42.0 | 19.0 | 40.0 | |
| Total Split (%) | 8.3% | 36.7% | | 12.5% | 40.8% | 15.8% | 17.5% | 35.0% | 35.0% | 15.8% | 33.3% | |
| Maximum Green (s) | 6.0 | 39.0 | | 11.0 | 44.0 | 15.0 | 17.0 | 37.0 | 37.0 | 15.0 | 35.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | |
| Lead/Lag | Lag | Lag | | Lead | Lead | Lead | Lag | Lag | Lag | Lead | Lead | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | C-Max | | None | C-Max | None | None | Max | Max | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | 7.0 | | 7.0 | |
| Flash Dont Walk (s) | | 23.0 | | | 30.0 | | | 30.0 | 30.0 | | 28.0 | |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | | | 2 | 2 | | 2 | |
| Act Effct Green (s) | 6.0 | 39.0 | | 11.0 | 44.0 | 60.0 | 17.0 | 37.0 | 37.0 | 15.0 | 35.0 | |
| Actuated g/C Ratio | 0.05 | 0.32 | | 0.09 | 0.37 | 0.50 | 0.14 | 0.31 | 0.31 | 0.12 | 0.29 | |
| v/c Ratio | 0.73 | 1.12 | | 1.67 | 1.15 | 0.64 | 0.84 | 0.61 | 0.78 | 2.06 | 0.45 | |
| Control Delay | 49.6 | 78.6 | | 335.1 | 107.3 | 10.0 | 66.9 | 38.3 | 31.5 | 515.5 | 30.4 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 49.6 | 78.6 | | 335.1 | 107.9 | 10.0 | 66.9 | 38.3 | 31.5 | 515.5 | 30.4 | |
| LOS | D | E | | F | F | A | E | D | C | F | C | |
| Approach Delay | | 77.1 | | | 128.3 | | | 43.6 | | | 281.1 | |
| Approach LOS | | E | | | F | | | D | | | F | |
| Queue Length 50th (ft) | 44 | ~556 | | ~288 | ~691 | 153 | 151 | 217 | 197 | ~299 | 160 | |
| Queue Length 95th (ft) | m52 | m#625 | | m#229 | m508 | m107 | #228 | 281 | 341 | #407 | 217 | |
| Internal Link Dist (ft) | | 546 | | | 441 | | | 1346 | | | 648 | |
| Turn Bay Length (ft) | 180 | | | 325 | | 250 | 150 | | 200 | 260 | | |
| Base Capacity (vph) | 162 | 1963 | | 298 | 1766 | 804 | 460 | 1033 | 602 | 225 | 967 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 283 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.73 | 1.12 | | 1.67 | 1.37 | 0.64 | 0.84 | 0.61 | 0.78 | 2.06 | 0.45 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 116 (97%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow | | | |
| Natural Cycle: 115 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 2.06 | | | |
| Intersection Signal Delay: 114.5 | | Intersection LOS: F | |
| Intersection Capacity Utilization 107.3% | | ICU Level of Service G | |
| Analysis Period (min) 15 | | | |

~ Volume exceeds capacity, queue is theoretically infinite.

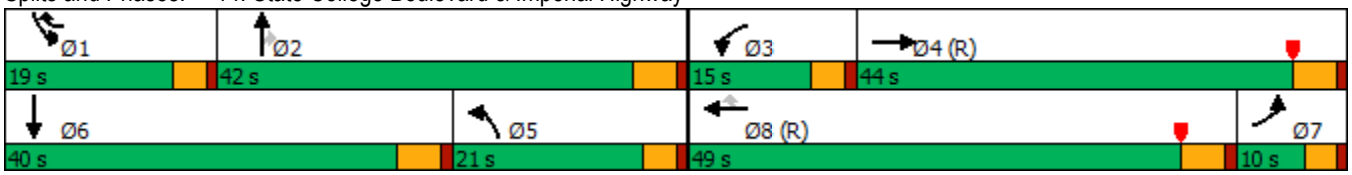
Queue shown is maximum after two cycles.

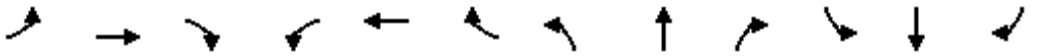
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

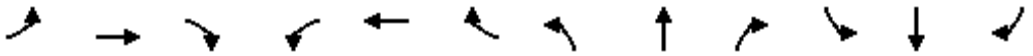
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: State College Boulevard & Imperial Highway





| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 338 | 1684 | 68 | 151 | 1996 | 497 | 107 | 49 | 209 | 441 | 90 | 314 |
| Future Volume (vph) | 338 | 1684 | 68 | 151 | 1996 | 497 | 107 | 49 | 209 | 441 | 90 | 314 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (ft) | 165 | | 0 | 190 | | 310 | 0 | | 0 | 160 | | 0 |
| Storage Lanes | 2 | | 0 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.91 | 0.91 | 1.00 | 0.91 | 1.00 | 0.91 | 0.91 | 0.95 | 0.97 | 1.00 | 1.00 |
| Frt | | 0.994 | | | | 0.850 | | 0.883 | | | 0.883 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | 0.998 | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 4789 | 0 | 1676 | 4818 | 1500 | 1526 | 2830 | 0 | 3252 | 1558 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | 0.998 | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 4789 | 0 | 1676 | 4818 | 1500 | 1526 | 2830 | 0 | 3252 | 1558 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 6 | | | | 437 | | 193 | | | 150 | |
| Link Speed (mph) | | 45 | | | 45 | | | 30 | | | 40 | |
| Link Distance (ft) | | 3572 | | | 626 | | | 275 | | | 499 | |
| Travel Time (s) | | 54.1 | | | 9.5 | | | 6.3 | | | 8.5 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 338 | 1684 | 68 | 151 | 1996 | 497 | 107 | 49 | 209 | 441 | 90 | 314 |
| Shared Lane Traffic (%) | | | | | | | 10% | | | | | |
| Lane Group Flow (vph) | 338 | 1752 | 0 | 151 | 1996 | 497 | 96 | 269 | 0 | 441 | 404 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | Perm | Split | NA | | Split | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | | | | 8 | | | | | | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Minimum Split (s) | 10.0 | 40.0 | | 10.0 | 41.0 | 41.0 | 11.0 | 11.0 | | 41.0 | 41.0 | |
| Total Split (s) | 17.0 | 52.0 | | 15.0 | 50.0 | 50.0 | 12.0 | 12.0 | | 41.0 | 41.0 | |
| Total Split (%) | 14.2% | 43.3% | | 12.5% | 41.7% | 41.7% | 10.0% | 10.0% | | 34.2% | 34.2% | |
| Maximum Green (s) | 13.0 | 47.0 | | 11.0 | 45.0 | 45.0 | 7.0 | 7.0 | | 36.0 | 36.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lag | Lead | | Lag | Lead | Lead | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | C-Max | | None | C-Max | C-Max | Max | Max | | Max | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | | 28.0 | | | 29.0 | 29.0 | | | | 29.0 | 29.0 | |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | 2 | | | | 2 | 2 | |
| Act Effct Green (s) | 13.0 | 47.0 | | 11.0 | 45.0 | 45.0 | 7.0 | 7.0 | | 36.0 | 36.0 | |
| Actuated g/C Ratio | 0.11 | 0.39 | | 0.09 | 0.38 | 0.38 | 0.06 | 0.06 | | 0.30 | 0.30 | |
| v/c Ratio | 0.96 | 0.93 | | 0.99 | 1.11 | 0.60 | 1.08 | 0.78 | | 0.45 | 0.71 | |
| Control Delay | 62.8 | 13.6 | | 63.2 | 61.2 | 0.5 | 171.3 | 33.2 | | 35.8 | 30.6 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 62.8 | 13.6 | | 63.2 | 61.2 | 1.5 | 171.3 | 33.2 | | 35.8 | 30.6 | |
| LOS | E | B | | E | E | A | F | C | | D | C | |
| Approach Delay | | 21.6 | | | 50.1 | | | 69.5 | | | 33.3 | |
| Approach LOS | | C | | | D | | | E | | | C | |
| Queue Length 50th (ft) | 144 | 176 | | 125 | ~621 | 7 | ~91 | 31 | | 142 | 177 | |
| Queue Length 95th (ft) | m151 | m203 | | m116 | m102 | m0 | #215 | #95 | | 191 | 300 | |
| Internal Link Dist (ft) | | 3492 | | | 546 | | | 195 | | | 419 | |
| Turn Bay Length (ft) | 165 | | | 190 | | 310 | | | | 160 | | |
| Base Capacity (vph) | 352 | 1879 | | 153 | 1806 | 835 | 89 | 346 | | 975 | 572 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 134 | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 0.96 | 0.93 | | 0.99 | 1.11 | 0.71 | 1.08 | 0.78 | | 0.45 | 0.71 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 114 (95%), Referenced to phase 4:EBT and 8:WBT, Start of Green | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.11 | |
| Intersection Signal Delay: 38.9 | Intersection LOS: D |
| Intersection Capacity Utilization 100.0% | ICU Level of Service G |
| Analysis Period (min) 15 | |

~ Volume exceeds capacity, queue is theoretically infinite.

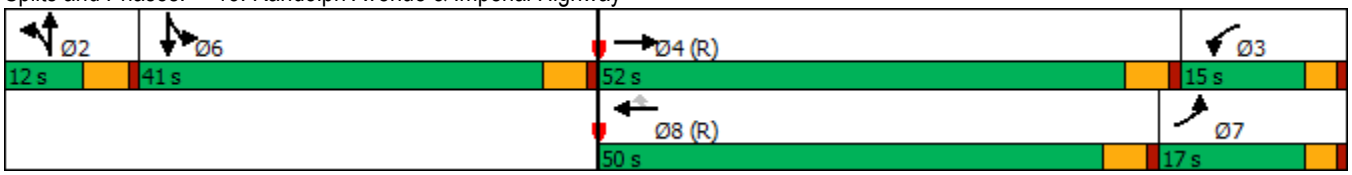
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

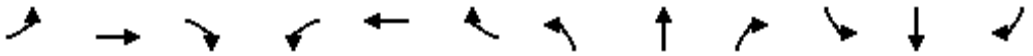
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Randolph Avenue & Imperial Highway



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 146 | 1770 | 239 | 699 | 2190 | 1155 | 326 | 655 | 780 | 617 | 442 | 195 |
| Future Volume (vph) | 146 | 1770 | 239 | 699 | 2190 | 1155 | 326 | 655 | 780 | 617 | 442 | 195 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1000 | 1800 | 1800 |
| Storage Length (ft) | 180 | | 290 | 325 | | 250 | 150 | | 200 | 260 | | 0 |
| Storage Lanes | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | | 0 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.86 | 0.86 | 0.97 | 0.91 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 0.95 |
| Frt | | 0.982 | | | | 0.850 | | | 0.850 | | 0.954 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 5961 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 1807 | 3199 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 5961 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 1807 | 3199 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 30 | | | | 67 | | | 207 | | 59 | |
| Link Speed (mph) | | 45 | | | 45 | | | 40 | | | 40 | |
| Link Distance (ft) | | 626 | | | 521 | | | 1426 | | | 728 | |
| Travel Time (s) | | 9.5 | | | 7.9 | | | 24.3 | | | 12.4 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 146 | 1770 | 239 | 699 | 2190 | 1155 | 326 | 655 | 780 | 617 | 442 | 195 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 146 | 2009 | 0 | 699 | 2190 | 1155 | 326 | 655 | 780 | 617 | 637 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 2.17 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | pm+ov | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | 8 | | | 2 | | | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | |
| Minimum Split (s) | 10.0 | 35.0 | | 10.0 | 42.0 | 10.0 | 10.0 | 42.0 | 42.0 | 10.0 | 40.0 | |
| Total Split (s) | 10.0 | 43.0 | | 15.0 | 48.0 | 18.0 | 22.0 | 44.0 | 44.0 | 18.0 | 40.0 | |
| Total Split (%) | 8.3% | 35.8% | | 12.5% | 40.0% | 15.0% | 18.3% | 36.7% | 36.7% | 15.0% | 33.3% | |
| Maximum Green (s) | 6.0 | 38.0 | | 11.0 | 43.0 | 14.0 | 18.0 | 39.0 | 39.0 | 14.0 | 35.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | |
| Lead/Lag | Lag | Lag | | Lead | Lead | Lag | Lag | Lead | Lead | Lag | Lead | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | C-Max | | None | C-Max | None | None | Max | Max | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | 7.0 | | 7.0 | |
| Flash Dont Walk (s) | | 23.0 | | | 30.0 | | | 30.0 | 30.0 | | 28.0 | |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | | | 2 | 2 | | 2 | |
| Act Effct Green (s) | 6.0 | 38.0 | | 11.0 | 43.0 | 62.0 | 18.0 | 39.0 | 39.0 | 14.0 | 35.0 | |
| Actuated g/C Ratio | 0.05 | 0.32 | | 0.09 | 0.36 | 0.52 | 0.15 | 0.32 | 0.32 | 0.12 | 0.29 | |
| v/c Ratio | 0.90 | 1.05 | | 2.35 | 1.27 | 1.43 | 0.67 | 0.60 | 1.24 | 2.94 | 0.65 | |
| Control Delay | 74.0 | 55.8 | | 635.7 | 157.1 | 222.5 | 55.7 | 36.8 | 149.9 | 904.6 | 37.3 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 74.0 | 55.8 | | 635.7 | 157.6 | 222.5 | 55.7 | 36.8 | 149.9 | 904.6 | 37.3 | |
| LOS | E | E | | F | F | F | E | D | F | F | D | |
| Approach Delay | | 57.1 | | | 258.8 | | | 90.4 | | | 464.0 | |
| Approach LOS | | E | | | F | | | F | | | F | |
| Queue Length 50th (ft) | 54 | ~473 | | ~471 | ~782 | ~1185 | 124 | 223 | ~639 | ~425 | 206 | |
| Queue Length 95th (ft) | m#74 | m#546 | | m#475 | m#781 | m#1192 | 174 | 286 | #884 | #541 | 272 | |
| Internal Link Dist (ft) | | 546 | | | 441 | | | 1346 | | | 648 | |
| Turn Bay Length (ft) | 180 | | | 325 | | 250 | 150 | | 200 | 260 | | |
| Base Capacity (vph) | 162 | 1908 | | 298 | 1726 | 807 | 487 | 1089 | 627 | 210 | 974 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 224 | 0 | 0 | 0 | 0 | 0 | 1 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.90 | 1.05 | | 2.35 | 1.46 | 1.43 | 0.67 | 0.60 | 1.24 | 2.94 | 0.65 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 30 (25%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow | | | |
| Natural Cycle: 115 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 2.94 | | | |
| Intersection Signal Delay: 207.3 | | Intersection LOS: F | |
| Intersection Capacity Utilization 127.4% | | ICU Level of Service H | |
| Analysis Period (min) 15 | | | |

~ Volume exceeds capacity, queue is theoretically infinite.

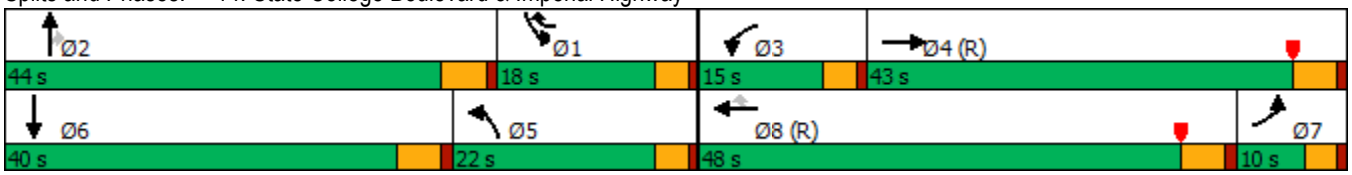
Queue shown is maximum after two cycles.

\# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

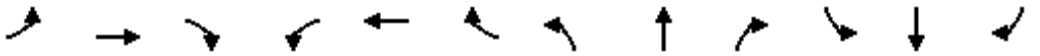
Splits and Phases: 14: State College Boulevard & Imperial Highway



*APPENDIX F-V*

# YEAR 2045 PLUS PROJECT TRAFFIC CONDITIONS

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 138 | 1742 | 27 | 43 | 1882 | 182 | 39 | 20 | 71 | 192 | 22 | 78 |
| Future Volume (vph) | 138 | 1742 | 27 | 43 | 1882 | 182 | 39 | 20 | 71 | 192 | 22 | 78 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (ft) | 165 | | 0 | 190 | | 310 | 0 | | 0 | 160 | | 0 |
| Storage Lanes | 2 | | 0 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.91 | 0.91 | 1.00 | 0.91 | 1.00 | 0.91 | 0.91 | 0.95 | 0.97 | 1.00 | 1.00 |
| Frt | | 0.998 | | | | 0.850 | | 0.888 | | | 0.883 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | 0.998 | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 4808 | 0 | 1676 | 4818 | 1500 | 1526 | 2846 | 0 | 3252 | 1558 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | 0.998 | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 4808 | 0 | 1676 | 4818 | 1500 | 1526 | 2846 | 0 | 3252 | 1558 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 2 | | | | 182 | | 71 | | | 78 | |
| Link Speed (mph) | | 45 | | | 45 | | | 30 | | | 40 | |
| Link Distance (ft) | | 3572 | | | 626 | | | 275 | | | 499 | |
| Travel Time (s) | | 54.1 | | | 9.5 | | | 6.3 | | | 8.5 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 138 | 1742 | 27 | 43 | 1882 | 182 | 39 | 20 | 71 | 192 | 22 | 78 |
| Shared Lane Traffic (%) | | | | | | | 10% | | | | | |
| Lane Group Flow (vph) | 138 | 1769 | 0 | 43 | 1882 | 182 | 35 | 95 | 0 | 192 | 100 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | Perm | Split | NA | | Split | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | | | | 8 | | | | | | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Minimum Split (s) | 10.0 | 40.0 | | 10.0 | 41.0 | 41.0 | 11.0 | 11.0 | | 41.0 | 41.0 | |
| Total Split (s) | 11.0 | 58.0 | | 10.0 | 57.0 | 57.0 | 11.0 | 11.0 | | 41.0 | 41.0 | |
| Total Split (%) | 9.2% | 48.3% | | 8.3% | 47.5% | 47.5% | 9.2% | 9.2% | | 34.2% | 34.2% | |
| Maximum Green (s) | 7.0 | 53.0 | | 6.0 | 52.0 | 52.0 | 6.0 | 6.0 | | 36.0 | 36.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lag | Lead | | Lag | Lead | Lead | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | C-Max | | None | C-Max | C-Max | Max | Max | | Max | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | | 28.0 | | | 29.0 | 29.0 | | | | 29.0 | 29.0 | |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | 2 | | | | 2 | 2 | |
| Act Effct Green (s) | 7.0 | 55.0 | | 6.0 | 52.0 | 52.0 | 6.0 | 6.0 | | 36.0 | 36.0 | |
| Actuated g/C Ratio | 0.06 | 0.46 | | 0.05 | 0.43 | 0.43 | 0.05 | 0.05 | | 0.30 | 0.30 | |
| v/c Ratio | 0.73 | 0.80 | | 0.52 | 0.90 | 0.24 | 0.46 | 0.45 | | 0.20 | 0.19 | |
| Control Delay | 43.2 | 5.8 | | 45.5 | 8.0 | 0.5 | 75.0 | 26.6 | | 24.9 | 8.9 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 43.2 | 5.8 | | 45.5 | 8.3 | 0.5 | 75.0 | 26.6 | | 24.9 | 8.9 | |
| LOS | D | A | | D | A | A | E | C | | C | A | |
| Approach Delay | | 8.5 | | | 8.4 | | | 39.6 | | | 19.4 | |
| Approach LOS | | A | | | A | | | D | | | B | |
| Queue Length 50th (ft) | 59 | 46 | | 36 | 54 | 0 | 29 | 9 | | 39 | 4 | |
| Queue Length 95th (ft) | m63 | m52 | | m42 | 74 | m1 | #72 | 40 | | 94 | 70 | |
| Internal Link Dist (ft) | | 3492 | | | 546 | | | 195 | | | 419 | |
| Turn Bay Length (ft) | 165 | | | 190 | | 310 | | | | 160 | | |
| Base Capacity (vph) | 189 | 2204 | | 83 | 2087 | 753 | 76 | 209 | | 975 | 522 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 21 | 0 | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 0.73 | 0.80 | | 0.52 | 0.91 | 0.24 | 0.46 | 0.45 | | 0.20 | 0.19 | |

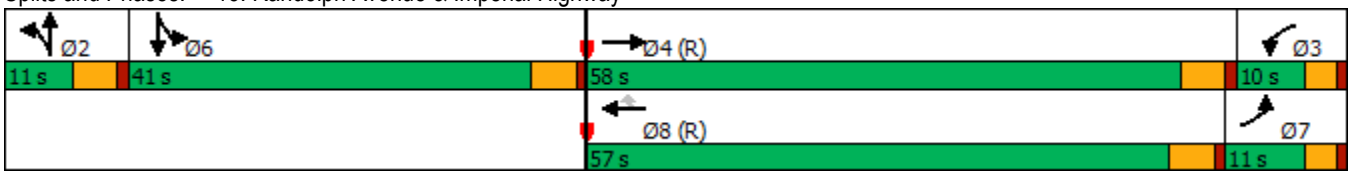
| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green | | | |
| Natural Cycle: 105 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.90 | | | |
| Intersection Signal Delay: 10.1 | | Intersection LOS: B | |
| Intersection Capacity Utilization 67.5% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

# 95th percentile volume exceeds capacity, queue may be longer.

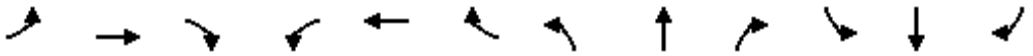
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Randolph Avenue & Imperial Highway



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 37 | 1775 | 214 | 534 | 1953 | 203 | 125 | 186 | 479 | 151 | 502 | 33 |
| Future Volume (vph) | 37 | 1775 | 214 | 534 | 1953 | 203 | 125 | 186 | 479 | 151 | 502 | 33 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1000 | 1800 | 1800 |
| Storage Length (ft) | 180 | | 290 | 325 | | 250 | 150 | | 200 | 260 | | 0 |
| Storage Lanes | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | | 0 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.86 | 0.86 | 0.97 | 0.91 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 0.95 |
| Frt | | 0.984 | | | | 0.850 | | | 0.850 | | 0.991 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 5973 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 1807 | 3323 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 5973 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 1807 | 3323 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 25 | | | | 201 | | | 357 | | 6 | |
| Link Speed (mph) | | 45 | | | 45 | | | 40 | | | 40 | |
| Link Distance (ft) | | 626 | | | 521 | | | 1426 | | | 728 | |
| Travel Time (s) | | 9.5 | | | 7.9 | | | 24.3 | | | 12.4 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 37 | 1775 | 214 | 534 | 1953 | 203 | 125 | 186 | 479 | 151 | 502 | 33 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 37 | 1989 | 0 | 534 | 1953 | 203 | 125 | 186 | 479 | 151 | 535 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 2.17 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | pm+ov | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | 8 | | | 2 | | | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | |
| Minimum Split (s) | 10.0 | 35.0 | | 10.0 | 42.0 | 10.0 | 10.0 | 42.0 | 42.0 | 10.0 | 40.0 | |
| Total Split (s) | 10.0 | 42.0 | | 23.0 | 55.0 | 13.0 | 13.0 | 42.0 | 42.0 | 13.0 | 42.0 | |
| Total Split (%) | 8.3% | 35.0% | | 19.2% | 45.8% | 10.8% | 10.8% | 35.0% | 35.0% | 10.8% | 35.0% | |
| Maximum Green (s) | 6.0 | 37.0 | | 19.0 | 50.0 | 9.0 | 9.0 | 37.0 | 37.0 | 9.0 | 37.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | |
| Lead/Lag | Lag | Lag | | Lead | Lead | Lag | Lag | Lead | Lead | Lag | Lead | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | C-Max | | None | C-Max | None | None | Max | Max | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | 7.0 | | 7.0 | |
| Flash Dont Walk (s) | | 23.0 | | | 30.0 | | | 30.0 | 30.0 | | 28.0 | |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | | | 2 | 2 | | 2 | |
| Act Effct Green (s) | 6.0 | 37.0 | | 19.0 | 54.0 | 68.0 | 9.0 | 37.0 | 37.0 | 9.0 | 37.0 | |
| Actuated g/C Ratio | 0.05 | 0.31 | | 0.16 | 0.45 | 0.57 | 0.08 | 0.31 | 0.31 | 0.08 | 0.31 | |
| v/c Ratio | 0.23 | 1.07 | | 1.04 | 0.90 | 0.22 | 0.51 | 0.18 | 0.68 | 1.12 | 0.52 | |
| Control Delay | 38.2 | 62.1 | | 82.7 | 37.8 | 5.1 | 61.4 | 31.0 | 14.5 | 147.9 | 13.9 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 38.2 | 62.1 | | 82.7 | 38.2 | 5.1 | 61.4 | 31.0 | 14.5 | 147.9 | 13.9 | |
| LOS | D | E | | F | D | A | E | C | B | F | B | |
| Approach Delay | | 61.7 | | | 44.5 | | | 25.8 | | | 43.4 | |
| Approach LOS | | E | | | D | | | C | | | D | |
| Queue Length 50th (ft) | 12 | ~476 | | ~225 | 560 | 22 | 48 | 55 | 74 | ~71 | 53 | |
| Queue Length 95th (ft) | m18 | #553 | | m#280 | #664 | m29 | 81 | 85 | 201 | #143 | 75 | |
| Internal Link Dist (ft) | | 546 | | | 441 | | | 1346 | | | 648 | |
| Turn Bay Length (ft) | 180 | | | 325 | | 250 | 150 | | 200 | 260 | | |
| Base Capacity (vph) | 162 | 1858 | | 514 | 2168 | 937 | 243 | 1033 | 709 | 135 | 1028 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.23 | 1.07 | | 1.04 | 0.91 | 0.22 | 0.51 | 0.18 | 0.68 | 1.12 | 0.52 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 45 (38%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow | | | |
| Natural Cycle: 115 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 1.12 | | | |
| Intersection Signal Delay: 47.6 | | Intersection LOS: D | |
| Intersection Capacity Utilization 82.8% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

~ Volume exceeds capacity, queue is theoretically infinite.

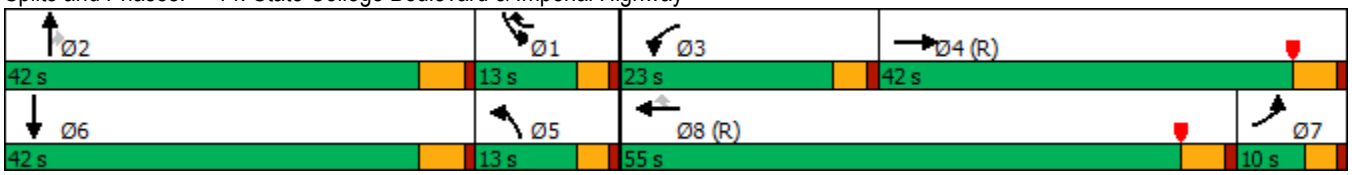
Queue shown is maximum after two cycles.

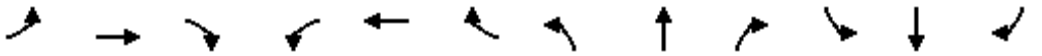
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

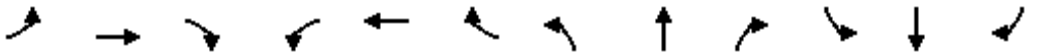
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: State College Boulevard & Imperial Highway





| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 333 | 1903 | 47 | 77 | 2114 | 385 | 61 | 41 | 72 | 369 | 32 | 250 |
| Future Volume (vph) | 333 | 1903 | 47 | 77 | 2114 | 385 | 61 | 41 | 72 | 369 | 32 | 250 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (ft) | 165 | | 0 | 190 | | 310 | 0 | | 0 | 160 | | 0 |
| Storage Lanes | 2 | | 0 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.91 | 0.91 | 1.00 | 0.91 | 1.00 | 0.91 | 0.91 | 0.95 | 0.97 | 1.00 | 1.00 |
| Frt | | 0.996 | | | | 0.850 | | 0.909 | | | 0.867 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | 0.997 | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 4798 | 0 | 1676 | 4818 | 1500 | 1526 | 2911 | 0 | 3252 | 1530 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | 0.997 | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 4798 | 0 | 1676 | 4818 | 1500 | 1526 | 2911 | 0 | 3252 | 1530 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 4 | | | | 333 | | 72 | | | 147 | |
| Link Speed (mph) | | 45 | | | 45 | | | 30 | | | 40 | |
| Link Distance (ft) | | 3572 | | | 626 | | | 275 | | | 499 | |
| Travel Time (s) | | 54.1 | | | 9.5 | | | 6.3 | | | 8.5 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 333 | 1903 | 47 | 77 | 2114 | 385 | 61 | 41 | 72 | 369 | 32 | 250 |
| Shared Lane Traffic (%) | | | | | | | 10% | | | | | |
| Lane Group Flow (vph) | 333 | 1950 | 0 | 77 | 2114 | 385 | 55 | 119 | 0 | 369 | 282 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | Perm | Split | NA | | Split | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | | | | 8 | | | | | | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Minimum Split (s) | 10.0 | 40.0 | | 10.0 | 41.0 | 41.0 | 11.0 | 11.0 | | 41.0 | 41.0 | |
| Total Split (s) | 15.0 | 57.0 | | 11.0 | 53.0 | 53.0 | 11.0 | 11.0 | | 41.0 | 41.0 | |
| Total Split (%) | 12.5% | 47.5% | | 9.2% | 44.2% | 44.2% | 9.2% | 9.2% | | 34.2% | 34.2% | |
| Maximum Green (s) | 11.0 | 52.0 | | 7.0 | 48.0 | 48.0 | 6.0 | 6.0 | | 36.0 | 36.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lag | Lead | | Lag | Lead | Lead | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | C-Max | | None | C-Max | C-Max | Max | Max | | Max | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | | 28.0 | | | 29.0 | 29.0 | | | | 29.0 | 29.0 | |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | 2 | | | | 2 | 2 | |
| Act Effct Green (s) | 11.0 | 52.0 | | 7.0 | 48.0 | 48.0 | 6.0 | 6.0 | | 36.0 | 36.0 | |
| Actuated g/C Ratio | 0.09 | 0.43 | | 0.06 | 0.40 | 0.40 | 0.05 | 0.05 | | 0.30 | 0.30 | |
| v/c Ratio | 1.12 | 0.94 | | 0.79 | 1.10 | 0.48 | 0.72 | 0.56 | | 0.38 | 0.50 | |
| Control Delay | 95.7 | 8.5 | | 42.4 | 64.5 | 1.7 | 102.3 | 35.1 | | 31.1 | 20.7 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 1.3 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 95.7 | 8.5 | | 42.4 | 65.8 | 1.7 | 102.3 | 35.1 | | 31.1 | 20.7 | |
| LOS | F | A | | D | E | A | F | D | | C | C | |
| Approach Delay | | 21.2 | | | 55.5 | | | 56.3 | | | 26.6 | |
| Approach LOS | | C | | | E | | | E | | | C | |
| Queue Length 50th (ft) | ~157 | 124 | | 63 | ~656 | 18 | 47 | 19 | | 97 | 60 | |
| Queue Length 95th (ft) | m#157 | m121 | | m61 | m215 | m16 | #127 | 52 | | 208 | 245 | |
| Internal Link Dist (ft) | | 3492 | | | 546 | | | 195 | | | 419 | |
| Turn Bay Length (ft) | 165 | | | 190 | | 310 | | | | 160 | | |
| Base Capacity (vph) | 298 | 2081 | | 97 | 1927 | 799 | 76 | 213 | | 975 | 561 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 7 | 0 | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 1.12 | 0.94 | | 0.79 | 1.10 | 0.48 | 0.72 | 0.56 | | 0.38 | 0.50 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 68 (57%), Referenced to phase 4:EBT and 8:WBT, Start of Green | | | |
| Natural Cycle: 115 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 1.12 | | | |
| Intersection Signal Delay: 38.5 | | Intersection LOS: D | |
| Intersection Capacity Utilization 92.0% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

~ Volume exceeds capacity, queue is theoretically infinite.

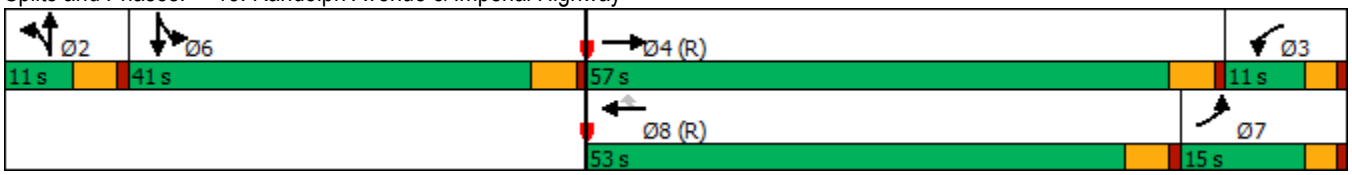
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

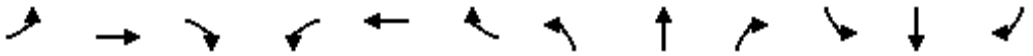
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Randolph Avenue & Imperial Highway



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 118 | 2096 | 122 | 497 | 2061 | 591 | 391 | 655 | 471 | 481 | 339 | 103 |
| Future Volume (vph) | 118 | 2096 | 122 | 497 | 2061 | 591 | 391 | 655 | 471 | 481 | 339 | 103 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1000 | 1800 | 1800 |
| Storage Length (ft) | 180 | | 290 | 325 | | 250 | 150 | | 200 | 260 | | 0 |
| Storage Lanes | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | | 0 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.86 | 0.86 | 0.97 | 0.91 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 0.95 |
| Frt | | 0.992 | | | | 0.850 | | | 0.850 | | 0.965 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 6022 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 1807 | 3236 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 6022 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 1807 | 3236 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 10 | | | | 109 | | | 201 | | 34 | |
| Link Speed (mph) | | 45 | | | 45 | | | 40 | | | 40 | |
| Link Distance (ft) | | 626 | | | 521 | | | 1426 | | | 728 | |
| Travel Time (s) | | 9.5 | | | 7.9 | | | 24.3 | | | 12.4 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 118 | 2096 | 122 | 497 | 2061 | 591 | 391 | 655 | 471 | 481 | 339 | 103 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 118 | 2218 | 0 | 497 | 2061 | 591 | 391 | 655 | 471 | 481 | 442 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 2.17 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | pm+ov | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | 8 | | | 2 | | | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | |
| Minimum Split (s) | 10.0 | 35.0 | | 10.0 | 42.0 | 10.0 | 10.0 | 42.0 | 42.0 | 10.0 | 40.0 | |
| Total Split (s) | 10.0 | 44.0 | | 15.0 | 49.0 | 19.0 | 21.0 | 42.0 | 42.0 | 19.0 | 40.0 | |
| Total Split (%) | 8.3% | 36.7% | | 12.5% | 40.8% | 15.8% | 17.5% | 35.0% | 35.0% | 15.8% | 33.3% | |
| Maximum Green (s) | 6.0 | 39.0 | | 11.0 | 44.0 | 15.0 | 17.0 | 37.0 | 37.0 | 15.0 | 35.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | |
| Lead/Lag | Lag | Lag | | Lead | Lead | Lead | Lag | Lag | Lag | Lead | Lead | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | C-Max | | None | C-Max | None | None | Max | Max | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | 7.0 | | 7.0 | |
| Flash Dont Walk (s) | | 23.0 | | | 30.0 | | | 30.0 | 30.0 | | 28.0 | |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | | | 2 | 2 | | 2 | |
| Act Effct Green (s) | 6.0 | 39.0 | | 11.0 | 44.0 | 60.0 | 17.0 | 37.0 | 37.0 | 15.0 | 35.0 | |
| Actuated g/C Ratio | 0.05 | 0.32 | | 0.09 | 0.37 | 0.50 | 0.14 | 0.31 | 0.31 | 0.12 | 0.29 | |
| v/c Ratio | 0.73 | 1.13 | | 1.67 | 1.17 | 0.74 | 0.85 | 0.63 | 0.78 | 2.14 | 0.46 | |
| Control Delay | 49.9 | 83.2 | | 335.1 | 112.5 | 11.8 | 68.2 | 39.0 | 31.6 | 547.9 | 30.7 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 49.9 | 83.2 | | 335.1 | 113.1 | 11.8 | 68.2 | 39.0 | 31.6 | 547.9 | 30.7 | |
| LOS | D | F | | F | F | B | E | D | C | F | C | |
| Approach Delay | | 81.5 | | | 129.1 | | | 44.2 | | | 300.2 | |
| Approach LOS | | F | | | F | | | D | | | F | |
| Queue Length 50th (ft) | 44 | ~566 | | ~288 | ~706 | 217 | 154 | 229 | 198 | ~313 | 163 | |
| Queue Length 95th (ft) | m53 | m#634 | | m#272 | m#658 | m195 | #234 | 294 | 341 | #423 | 222 | |
| Internal Link Dist (ft) | | 546 | | | 441 | | | 1346 | | | 648 | |
| Turn Bay Length (ft) | 180 | | | 325 | | 250 | 150 | | 200 | 260 | | |
| Base Capacity (vph) | 162 | 1963 | | 298 | 1766 | 804 | 460 | 1033 | 601 | 225 | 967 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 283 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.73 | 1.13 | | 1.67 | 1.39 | 0.74 | 0.85 | 0.63 | 0.78 | 2.14 | 0.46 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 116 (97%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow | | | |
| Natural Cycle: 115 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 2.14 | | | |
| Intersection Signal Delay: 118.8 | | Intersection LOS: F | |
| Intersection Capacity Utilization 109.4% | | ICU Level of Service H | |
| Analysis Period (min) 15 | | | |

~ Volume exceeds capacity, queue is theoretically infinite.

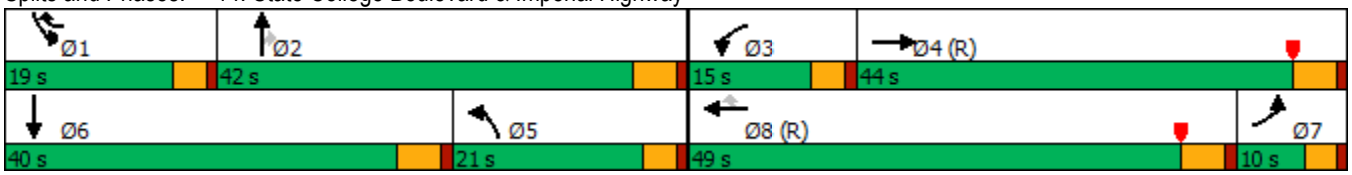
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

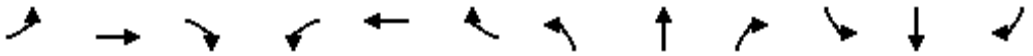
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: State College Boulevard & Imperial Highway



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 360 | 1684 | 68 | 151 | 1996 | 520 | 107 | 49 | 209 | 467 | 90 | 367 |
| Future Volume (vph) | 360 | 1684 | 68 | 151 | 1996 | 520 | 107 | 49 | 209 | 467 | 90 | 367 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (ft) | 165 | | 0 | 190 | | 310 | 0 | | 0 | 160 | | 0 |
| Storage Lanes | 2 | | 0 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.91 | 0.91 | 1.00 | 0.91 | 1.00 | 0.91 | 0.91 | 0.95 | 0.97 | 1.00 | 1.00 |
| Frt | | 0.994 | | | | 0.850 | | 0.883 | | | 0.880 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | 0.998 | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 4789 | 0 | 1676 | 4818 | 1500 | 1526 | 2830 | 0 | 3252 | 1553 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | 0.998 | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 4789 | 0 | 1676 | 4818 | 1500 | 1526 | 2830 | 0 | 3252 | 1553 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 6 | | | | 458 | | 187 | | | 175 | |
| Link Speed (mph) | | 45 | | | 45 | | | 30 | | | 40 | |
| Link Distance (ft) | | 3572 | | | 626 | | | 275 | | | 499 | |
| Travel Time (s) | | 54.1 | | | 9.5 | | | 6.3 | | | 8.5 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 360 | 1684 | 68 | 151 | 1996 | 520 | 107 | 49 | 209 | 467 | 90 | 367 |
| Shared Lane Traffic (%) | | | | | | | 10% | | | | | |
| Lane Group Flow (vph) | 360 | 1752 | 0 | 151 | 1996 | 520 | 96 | 269 | 0 | 467 | 457 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | Perm | Split | NA | | Split | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | | | | 8 | | | | | | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Minimum Split (s) | 10.0 | 40.0 | | 10.0 | 41.0 | 41.0 | 11.0 | 11.0 | | 41.0 | 41.0 | |
| Total Split (s) | 17.0 | 52.0 | | 15.0 | 50.0 | 50.0 | 12.0 | 12.0 | | 41.0 | 41.0 | |
| Total Split (%) | 14.2% | 43.3% | | 12.5% | 41.7% | 41.7% | 10.0% | 10.0% | | 34.2% | 34.2% | |
| Maximum Green (s) | 13.0 | 47.0 | | 11.0 | 45.0 | 45.0 | 7.0 | 7.0 | | 36.0 | 36.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | Lag | Lead | | Lag | Lead | Lead | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | C-Max | | None | C-Max | C-Max | Max | Max | | Max | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | | 28.0 | | | 29.0 | 29.0 | | | | 29.0 | 29.0 | |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | 2 | | | | 2 | 2 | |
| Act Effct Green (s) | 13.0 | 47.0 | | 11.0 | 45.0 | 45.0 | 7.0 | 7.0 | | 36.0 | 36.0 | |
| Actuated g/C Ratio | 0.11 | 0.39 | | 0.09 | 0.38 | 0.38 | 0.06 | 0.06 | | 0.30 | 0.30 | |
| v/c Ratio | 1.02 | 0.93 | | 0.99 | 1.11 | 0.61 | 1.08 | 0.79 | | 0.48 | 0.78 | |
| Control Delay | 75.9 | 13.5 | | 63.2 | 61.2 | 0.7 | 171.3 | 35.3 | | 36.3 | 33.5 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 1.1 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 75.9 | 13.5 | | 63.2 | 61.2 | 1.8 | 171.3 | 35.3 | | 36.3 | 33.5 | |
| LOS | E | B | | E | E | A | F | D | | D | C | |
| Approach Delay | | 24.2 | | | 49.7 | | | 71.0 | | | 34.9 | |
| Approach LOS | | C | | | D | | | E | | | C | |
| Queue Length 50th (ft) | ~157 | 176 | | 125 | ~622 | 7 | ~91 | 34 | | 152 | 206 | |
| Queue Length 95th (ft) | m#168 | m198 | | m115 | m101 | m0 | #215 | #101 | | 203 | 345 | |
| Internal Link Dist (ft) | | 3492 | | | 546 | | | 195 | | | 419 | |
| Turn Bay Length (ft) | 165 | | | 190 | | 310 | | | | 160 | | |
| Base Capacity (vph) | 352 | 1879 | | 153 | 1806 | 848 | 89 | 341 | | 975 | 588 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 143 | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 1.02 | 0.93 | | 0.99 | 1.11 | 0.74 | 1.08 | 0.79 | | 0.48 | 0.78 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 114 (95%), Referenced to phase 4:EBT and 8:WBT, Start of Green | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.11 | |
| Intersection Signal Delay: 39.9 | Intersection LOS: D |
| Intersection Capacity Utilization 104.1% | ICU Level of Service G |
| Analysis Period (min) 15 | |

~ Volume exceeds capacity, queue is theoretically infinite.

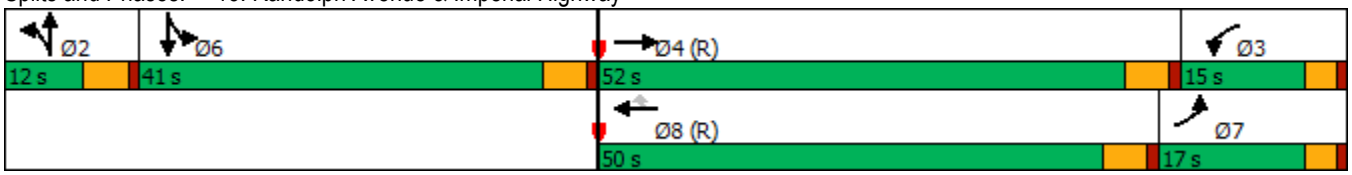
Queue shown is maximum after two cycles.

\# 95th percentile volume exceeds capacity, queue may be longer.

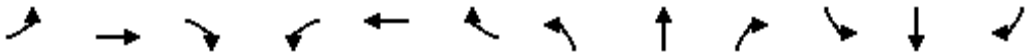
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Randolph Avenue & Imperial Highway



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 146 | 1791 | 244 | 699 | 2208 | 1173 | 331 | 665 | 780 | 677 | 464 | 195 |
| Future Volume (vph) | 146 | 1791 | 244 | 699 | 2208 | 1173 | 331 | 665 | 780 | 677 | 464 | 195 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1000 | 1800 | 1800 |
| Storage Length (ft) | 180 | | 290 | 325 | | 250 | 150 | | 200 | 260 | | 0 |
| Storage Lanes | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | | 0 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.86 | 0.86 | 0.97 | 0.91 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 0.95 |
| Frt | | 0.982 | | | | 0.850 | | | 0.850 | | 0.956 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 5961 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 1807 | 3205 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 5961 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 1807 | 3205 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 30 | | | | 65 | | | 207 | | 54 | |
| Link Speed (mph) | | 45 | | | 45 | | | 40 | | | 40 | |
| Link Distance (ft) | | 626 | | | 521 | | | 1426 | | | 728 | |
| Travel Time (s) | | 9.5 | | | 7.9 | | | 24.3 | | | 12.4 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 146 | 1791 | 244 | 699 | 2208 | 1173 | 331 | 665 | 780 | 677 | 464 | 195 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 146 | 2035 | 0 | 699 | 2208 | 1173 | 331 | 665 | 780 | 677 | 659 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 2.17 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | pm+ov | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | 8 | | | 2 | | | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | |
| Minimum Split (s) | 10.0 | 35.0 | | 10.0 | 42.0 | 10.0 | 10.0 | 42.0 | 42.0 | 10.0 | 40.0 | |
| Total Split (s) | 10.0 | 43.0 | | 15.0 | 48.0 | 18.0 | 22.0 | 44.0 | 44.0 | 18.0 | 40.0 | |
| Total Split (%) | 8.3% | 35.8% | | 12.5% | 40.0% | 15.0% | 18.3% | 36.7% | 36.7% | 15.0% | 33.3% | |
| Maximum Green (s) | 6.0 | 38.0 | | 11.0 | 43.0 | 14.0 | 18.0 | 39.0 | 39.0 | 14.0 | 35.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | |
| Lead/Lag | Lag | Lag | | Lead | Lead | Lag | Lag | Lead | Lead | Lag | Lead | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | C-Max | | None | C-Max | None | None | Max | Max | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | 7.0 | | 7.0 | |
| Flash Dont Walk (s) | | 23.0 | | | 30.0 | | | 30.0 | 30.0 | | 28.0 | |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | | | 2 | 2 | | 2 | |
| Act Effct Green (s) | 6.0 | 38.0 | | 11.0 | 43.0 | 62.0 | 18.0 | 39.0 | 39.0 | 14.0 | 35.0 | |
| Actuated g/C Ratio | 0.05 | 0.32 | | 0.09 | 0.36 | 0.52 | 0.15 | 0.32 | 0.32 | 0.12 | 0.29 | |
| v/c Ratio | 0.90 | 1.07 | | 2.35 | 1.28 | 1.46 | 0.68 | 0.61 | 1.24 | 3.22 | 0.68 | |
| Control Delay | 74.1 | 61.2 | | 635.5 | 161.5 | 233.0 | 56.1 | 37.0 | 149.9 | 1030.9 | 38.4 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 74.1 | 61.2 | | 635.5 | 162.0 | 233.0 | 56.1 | 37.0 | 149.9 | 1030.9 | 38.4 | |
| LOS | E | E | | F | F | F | E | D | F | F | D | |
| Approach Delay | | 62.1 | | | 263.5 | | | 90.1 | | | 541.3 | |
| Approach LOS | | E | | | F | | | F | | | F | |
| Queue Length 50th (ft) | 55 | ~486 | | ~470 | ~793 | ~1216 | 126 | 227 | ~639 | ~474 | 218 | |
| Queue Length 95th (ft) | m#75 | m#560 | | m#470 | m#780 | m#1208 | 177 | 291 | #884 | #593 | 286 | |
| Internal Link Dist (ft) | | 546 | | | 441 | | | 1346 | | | 648 | |
| Turn Bay Length (ft) | 180 | | | 325 | | 250 | 150 | | 200 | 260 | | |
| Base Capacity (vph) | 162 | 1908 | | 298 | 1726 | 806 | 487 | 1089 | 627 | 210 | 973 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 227 | 0 | 0 | 0 | 0 | 0 | 1 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.90 | 1.07 | | 2.35 | 1.47 | 1.46 | 0.68 | 0.61 | 1.24 | 3.22 | 0.68 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 30 (25%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow | | | |
| Natural Cycle: 115 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 3.22 | | | |
| Intersection Signal Delay: 223.4 | | Intersection LOS: F | |
| Intersection Capacity Utilization 131.0% | | ICU Level of Service H | |
| Analysis Period (min) 15 | | | |

~ Volume exceeds capacity, queue is theoretically infinite.

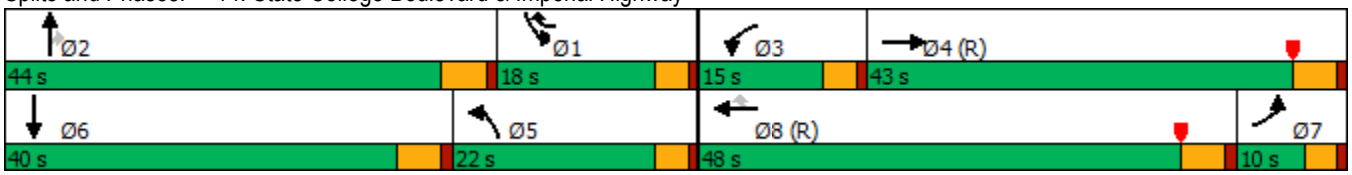
Queue shown is maximum after two cycles.

\# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

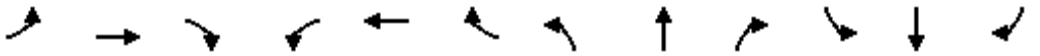
Splits and Phases: 14: State College Boulevard & Imperial Highway



*APPENDIX F-VI*

# YEAR 2045 PLUS PROJECT WITH IMPROVEMENTS TRAFFIC CONDITIONS

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 37 | 1775 | 214 | 534 | 1953 | 203 | 125 | 186 | 479 | 151 | 502 | 33 |
| Future Volume (vph) | 37 | 1775 | 214 | 534 | 1953 | 203 | 125 | 186 | 479 | 151 | 502 | 33 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (ft) | 180 | | 290 | 325 | | 250 | 150 | | 200 | 260 | | 275 |
| Storage Lanes | 2 | | 1 | 2 | | 1 | 2 | | 1 | 1 | | 1 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.86 | 0.86 | 0.97 | 0.91 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.984 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 5973 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 3252 | 3353 | 1500 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 5973 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 3252 | 3353 | 1500 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 25 | | | | 201 | | | 357 | | | 136 |
| Link Speed (mph) | | 45 | | | 45 | | | 40 | | | 40 | |
| Link Distance (ft) | | 626 | | | 521 | | | 1426 | | | 728 | |
| Travel Time (s) | | 9.5 | | | 7.9 | | | 24.3 | | | 12.4 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 37 | 1775 | 214 | 534 | 1953 | 203 | 125 | 186 | 479 | 151 | 502 | 33 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 37 | 1989 | 0 | 534 | 1953 | 203 | 125 | 186 | 479 | 151 | 502 | 33 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 36 | | | 36 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | pm+ov | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | 8 | | | 2 | | | 6 |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Minimum Split (s) | 10.0 | 35.0 | | 10.0 | 42.0 | 10.0 | 10.0 | 42.0 | 42.0 | 10.0 | 40.0 | 40.0 |
| Total Split (s) | 10.0 | 42.0 | | 23.0 | 55.0 | 13.0 | 13.0 | 42.0 | 42.0 | 13.0 | 42.0 | 42.0 |
| Total Split (%) | 8.3% | 35.0% | | 19.2% | 45.8% | 10.8% | 10.8% | 35.0% | 35.0% | 10.8% | 35.0% | 35.0% |
| Maximum Green (s) | 6.0 | 37.0 | | 19.0 | 50.0 | 9.0 | 9.0 | 37.0 | 37.0 | 9.0 | 37.0 | 37.0 |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | 5.0 |
| Lead/Lag | Lag | Lag | | Lead | Lead | Lag | Lag | Lead | Lead | Lag | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | C-Max | | None | C-Max | None | None | Max | Max | None | Max | Max |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | 7.0 | | 7.0 | 7.0 |
| Flash Dont Walk (s) | | 23.0 | | | 30.0 | | | 30.0 | 30.0 | | 28.0 | 28.0 |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | | | 2 | 2 | | 2 | 2 |
| Act Effct Green (s) | 6.0 | 37.0 | | 19.2 | 54.2 | 68.0 | 8.8 | 37.0 | 37.0 | 8.8 | 37.0 | 37.0 |
| Actuated g/C Ratio | 0.05 | 0.31 | | 0.16 | 0.45 | 0.57 | 0.07 | 0.31 | 0.31 | 0.07 | 0.31 | 0.31 |
| v/c Ratio | 0.23 | 1.07 | | 1.02 | 0.90 | 0.22 | 0.53 | 0.18 | 0.68 | 0.64 | 0.49 | 0.06 |
| Control Delay | 38.2 | 62.1 | | 79.1 | 37.5 | 5.1 | 62.1 | 31.0 | 14.5 | 46.9 | 14.0 | 0.2 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 38.2 | 62.1 | | 79.1 | 37.9 | 5.1 | 62.1 | 31.0 | 14.5 | 46.9 | 14.0 | 0.2 |
| LOS | D | E | | E | D | A | E | C | B | D | B | A |
| Approach Delay | | 61.7 | | | 43.6 | | | 25.9 | | | 20.6 | |
| Approach LOS | | E | | | D | | | C | | | C | |
| Queue Length 50th (ft) | 12 | ~476 | | ~225 | 560 | 22 | 48 | 55 | 74 | 62 | 51 | 0 |
| Queue Length 95th (ft) | m18 | #553 | | m#280 | #664 | m29 | 81 | 85 | 201 | 99 | 73 | m0 |
| Internal Link Dist (ft) | | 546 | | | 441 | | | 1346 | | | 648 | |
| Turn Bay Length (ft) | 180 | | | 325 | | 250 | 150 | | 200 | 260 | | 275 |
| Base Capacity (vph) | 162 | 1858 | | 521 | 2177 | 930 | 243 | 1033 | 709 | 243 | 1033 | 556 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.23 | 1.07 | | 1.02 | 0.91 | 0.22 | 0.51 | 0.18 | 0.68 | 0.62 | 0.49 | 0.06 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 45 (38%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow | | | |
| Natural Cycle: 115 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 1.07 | | | |
| Intersection Signal Delay: 44.7 | | Intersection LOS: D | |
| Intersection Capacity Utilization 81.7% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

~ Volume exceeds capacity, queue is theoretically infinite.

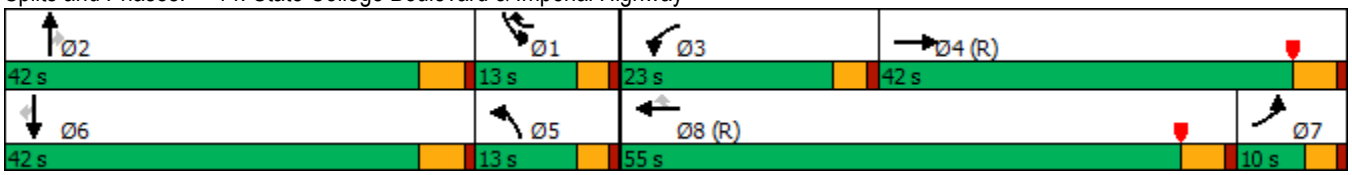
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

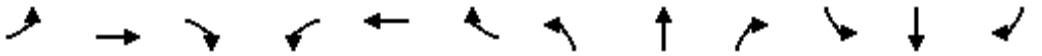
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: State College Boulevard & Imperial Highway



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 118 | 2096 | 122 | 497 | 2061 | 591 | 391 | 655 | 471 | 481 | 339 | 103 |
| Future Volume (vph) | 118 | 2096 | 122 | 497 | 2061 | 591 | 391 | 655 | 471 | 481 | 339 | 103 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (ft) | 180 | | 290 | 325 | | 250 | 150 | | 200 | 260 | | 275 |
| Storage Lanes | 2 | | 1 | 2 | | 1 | 2 | | 1 | 1 | | 1 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.86 | 0.86 | 0.97 | 0.91 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.992 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 6022 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 3252 | 3353 | 1500 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 6022 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 3252 | 3353 | 1500 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 10 | | | | 109 | | | 201 | | | 145 |
| Link Speed (mph) | | 45 | | | 45 | | | 40 | | | 40 | |
| Link Distance (ft) | | 626 | | | 521 | | | 1426 | | | 728 | |
| Travel Time (s) | | 9.5 | | | 7.9 | | | 24.3 | | | 12.4 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 118 | 2096 | 122 | 497 | 2061 | 591 | 391 | 655 | 471 | 481 | 339 | 103 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 118 | 2218 | 0 | 497 | 2061 | 591 | 391 | 655 | 471 | 481 | 339 | 103 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 36 | | | 36 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | pm+ov | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | 8 | | | 2 | | | 6 |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Minimum Split (s) | 10.0 | 35.0 | | 10.0 | 42.0 | 10.0 | 10.0 | 42.0 | 42.0 | 10.0 | 40.0 | 40.0 |
| Total Split (s) | 10.0 | 44.0 | | 15.0 | 49.0 | 19.0 | 21.0 | 42.0 | 42.0 | 19.0 | 40.0 | 40.0 |
| Total Split (%) | 8.3% | 36.7% | | 12.5% | 40.8% | 15.8% | 17.5% | 35.0% | 35.0% | 15.8% | 33.3% | 33.3% |
| Maximum Green (s) | 6.0 | 39.0 | | 11.0 | 44.0 | 15.0 | 17.0 | 37.0 | 37.0 | 15.0 | 35.0 | 35.0 |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | 5.0 |
| Lead/Lag | Lag | Lag | | Lead | Lead | Lead | Lag | Lag | Lag | Lead | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | C-Max | | None | C-Max | None | None | Max | Max | None | Max | Max |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | 7.0 | | 7.0 | 7.0 |
| Flash Dont Walk (s) | | 23.0 | | | 30.0 | | | 30.0 | 30.0 | | 28.0 | 28.0 |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | | | 2 | 2 | | 2 | 2 |
| Act Effct Green (s) | 6.0 | 39.0 | | 11.0 | 44.0 | 60.0 | 17.0 | 37.0 | 37.0 | 15.0 | 35.0 | 35.0 |
| Actuated g/C Ratio | 0.05 | 0.32 | | 0.09 | 0.37 | 0.50 | 0.14 | 0.31 | 0.31 | 0.12 | 0.29 | 0.29 |
| v/c Ratio | 0.73 | 1.13 | | 1.67 | 1.17 | 0.74 | 0.85 | 0.63 | 0.78 | 1.18 | 0.35 | 0.19 |
| Control Delay | 49.9 | 83.2 | | 335.1 | 112.5 | 11.8 | 68.2 | 39.0 | 31.6 | 139.0 | 31.5 | 6.2 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 49.9 | 83.2 | | 335.1 | 113.1 | 11.8 | 68.2 | 39.0 | 31.6 | 139.0 | 31.5 | 6.2 |
| LOS | D | F | | F | F | B | E | D | C | F | C | A |
| Approach Delay | | 81.5 | | | 129.1 | | | 44.2 | | | 84.7 | |
| Approach LOS | | F | | | F | | | D | | | F | |
| Queue Length 50th (ft) | 44 | ~566 | | ~288 | ~706 | 217 | 154 | 229 | 198 | ~236 | 120 | 16 |
| Queue Length 95th (ft) | m53 | m#634 | | m#272 | m#658 | m195 | #234 | 294 | 341 | #346 | 176 | m38 |
| Internal Link Dist (ft) | | 546 | | | 441 | | | 1346 | | | 648 | |
| Turn Bay Length (ft) | 180 | | | 325 | | 250 | 150 | | 200 | 260 | | 275 |
| Base Capacity (vph) | 162 | 1963 | | 298 | 1766 | 804 | 460 | 1033 | 601 | 406 | 977 | 540 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 279 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.73 | 1.13 | | 1.67 | 1.39 | 0.74 | 0.85 | 0.63 | 0.78 | 1.18 | 0.35 | 0.19 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 116 (97%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow | | | |
| Natural Cycle: 115 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 1.67 | | | |
| Intersection Signal Delay: 93.7 | | Intersection LOS: F | |
| Intersection Capacity Utilization 97.8% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

~ Volume exceeds capacity, queue is theoretically infinite.

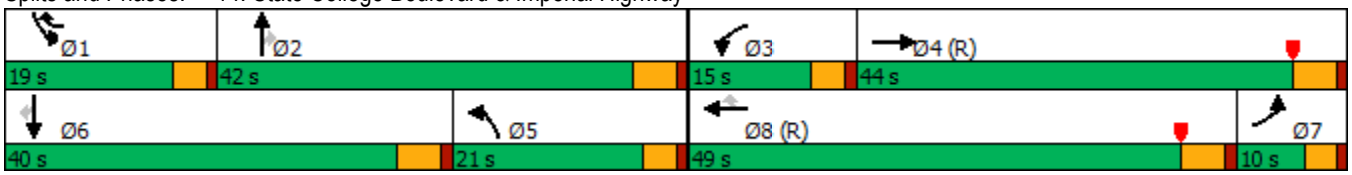
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

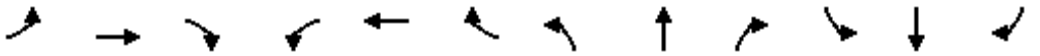
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: State College Boulevard & Imperial Highway



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 146 | 1791 | 244 | 699 | 2208 | 1173 | 331 | 665 | 780 | 677 | 464 | 195 |
| Future Volume (vph) | 146 | 1791 | 244 | 699 | 2208 | 1173 | 331 | 665 | 780 | 677 | 464 | 195 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (ft) | 180 | | 290 | 325 | | 250 | 150 | | 200 | 260 | | 275 |
| Storage Lanes | 2 | | 1 | 2 | | 1 | 2 | | 1 | 1 | | 1 |
| Taper Length (ft) | 90 | | | 90 | | | 90 | | | 90 | | |
| Lane Util. Factor | 0.97 | 0.86 | 0.86 | 0.97 | 0.91 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.982 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 5961 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 3252 | 3353 | 1500 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 5961 | 0 | 3252 | 4818 | 1500 | 3252 | 3353 | 1500 | 3252 | 3353 | 1500 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 30 | | | | 65 | | | 207 | | | 136 |
| Link Speed (mph) | | 45 | | | 45 | | | 40 | | | 40 | |
| Link Distance (ft) | | 626 | | | 521 | | | 1426 | | | 728 | |
| Travel Time (s) | | 9.5 | | | 7.9 | | | 24.3 | | | 12.4 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 146 | 1791 | 244 | 699 | 2208 | 1173 | 331 | 665 | 780 | 677 | 464 | 195 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 146 | 2035 | 0 | 699 | 2208 | 1173 | 331 | 665 | 780 | 677 | 464 | 195 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 36 | | | 36 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | Prot | NA | pm+ov | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | 8 | | | 2 | | | 6 |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector Phase | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Minimum Split (s) | 10.0 | 35.0 | | 10.0 | 42.0 | 10.0 | 10.0 | 42.0 | 42.0 | 10.0 | 40.0 | 40.0 |
| Total Split (s) | 10.0 | 43.0 | | 15.0 | 48.0 | 18.0 | 22.0 | 44.0 | 44.0 | 18.0 | 40.0 | 40.0 |
| Total Split (%) | 8.3% | 35.8% | | 12.5% | 40.0% | 15.0% | 18.3% | 36.7% | 36.7% | 15.0% | 33.3% | 33.3% |
| Maximum Green (s) | 6.0 | 38.0 | | 11.0 | 43.0 | 14.0 | 18.0 | 39.0 | 39.0 | 14.0 | 35.0 | 35.0 |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 4.0 | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | 5.0 |
| Lead/Lag | Lag | Lag | | Lead | Lead | Lag | Lag | Lead | Lead | Lag | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | C-Max | | None | C-Max | None | None | Max | Max | None | Max | Max |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | 7.0 | | 7.0 | 7.0 |
| Flash Dont Walk (s) | | 23.0 | | | 30.0 | | | 30.0 | 30.0 | | 28.0 | 28.0 |
| Pedestrian Calls (#/hr) | | 2 | | | 2 | | | 2 | 2 | | 2 | 2 |
| Act Effct Green (s) | 6.0 | 38.0 | | 11.0 | 43.0 | 62.0 | 18.0 | 39.0 | 39.0 | 14.0 | 35.0 | 35.0 |
| Actuated g/C Ratio | 0.05 | 0.32 | | 0.09 | 0.36 | 0.52 | 0.15 | 0.32 | 0.32 | 0.12 | 0.29 | 0.29 |
| v/c Ratio | 0.90 | 1.07 | | 2.35 | 1.28 | 1.46 | 0.68 | 0.61 | 1.24 | 1.79 | 0.47 | 0.37 |
| Control Delay | 74.1 | 61.2 | | 635.5 | 161.5 | 233.0 | 56.1 | 37.0 | 149.9 | 395.7 | 36.9 | 13.2 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 74.1 | 61.2 | | 635.5 | 162.0 | 233.0 | 56.1 | 37.0 | 149.9 | 395.7 | 36.9 | 13.2 |
| LOS | E | E | | F | F | F | E | D | F | F | D | B |
| Approach Delay | | 62.1 | | | 263.5 | | | 90.1 | | | 215.3 | |
| Approach LOS | | E | | | F | | | F | | | F | |
| Queue Length 50th (ft) | 55 | ~486 | | ~470 | ~793 | ~1216 | 126 | 227 | ~639 | ~405 | 155 | 34 |
| Queue Length 95th (ft) | m#75 | m#560 | | m#470 | m#780 | m#1208 | 177 | 291 | #884 | #523 | 207 | 97 |
| Internal Link Dist (ft) | | 546 | | | 441 | | | 1346 | | | 648 | |
| Turn Bay Length (ft) | 180 | | | 325 | | 250 | 150 | | 200 | 260 | | 275 |
| Base Capacity (vph) | 162 | 1908 | | 298 | 1726 | 806 | 487 | 1089 | 627 | 379 | 977 | 533 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 223 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.90 | 1.07 | | 2.35 | 1.47 | 1.46 | 0.68 | 0.61 | 1.24 | 1.79 | 0.47 | 0.37 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 30 (25%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow | | | |
| Natural Cycle: 115 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 2.35 | | | |
| Intersection Signal Delay: 176.9 | | Intersection LOS: F | |
| Intersection Capacity Utilization 114.7% | | ICU Level of Service H | |
| Analysis Period (min) 15 | | | |

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: State College Boulevard & Imperial Highway

