APPENDIX K

Traffic Impact Analysis

College Boulevard Improvements Project EIR
Draft Traffic Impact Analysis

Prepared for:
Dudek

Revised October 25, 2019

SD14-0153.01

FEHR PEERS

Table of Contents

1.0 EXECUTIVE SUMMARY 1

1.1 Study Area & Analysis Scenarios 1
1.2 Operational Impacts & Mitigation Measures 2
1.2.1 Intersection Operations Analysis Results 2
1.2.2 Roadway Operations Analysis Results 2

2.0 INTRODUCTION 4

2.1 Background 4
2.2 Project Description 5
2.3 Study Area 6
2.4 Analysis Scenarios 7
2.5 Traffic Analysis Methods 9
2.5.1 Signalized Intersections 9
2.5.2 Unsignalized intersections 11
2.5.3 Roadway Segments 11
2.5.4 LOS Standard & Significant Impact Criteria 13
2.6 Report Organization 15

3.0 EXISTING CONDITIONS 16

3.1 Existing Transportation Faciliities 16
3.1.1 Existing Street System 16
3.1.2 Existing Transit Services 18
3.1.3 Existing Bicycle Facilities 21
3.1.4 Existing Pedestrian facilities 22
3.2 Existing Intersection Volumes and Lane Configurations 24
3.3 Existing Intersection Operations 24
3.4 Existing Roadway Segment Operations 26
3.5 Speed Data 31

4.0 FUTURE FORECAST MODEL METHODOLOGY 33

5.0 OPERATIONAL ANALYSIS OF CORRIDOR CONDITIONS 35

5.1 Geometry Assumptions 44
5.2 Intersection Operations Analysis 48
5.2.1 Potential Intersection Impacts – Recommended Alternative 51
5.2.2 Left-Turn Queuing Assessment – Recommended Alternative 51
5.3 Roadway Segment Operational Analysis 54
5.3.1 Daily Roadway Segment Operations 54
5.3.2 Peak Hour Roadway Segment Operations 60
5.3.3 Potential Roadway Segment Impacts – Recommended Alternative 64

6.0 VEHICLE MILES TRAVELED ASSESSMENT 66

7.0 PEDESTRIAN & BICYCLE ANALYSIS 67

7.1.1 Pedestrian LOS 68
7.1.2 Bicycle LOS 70

8.0 RECOMMENDED ALTERNATIVE FINDINGS 72

Appendices

Appendix A: Traffic Count & Speed Data
Appendix B: Intersection LOS Worksheets
Appendix C: "Without Rancho del Oro Interchange" Memorandum
Appendix D: Queuing Reports
Appendix E: Peak Hour Roadway Segment LOS Worksheets
Appendix F: LOS+ Worksheets

List of Figures

Figure 1 Project Study Area and Intersections 8
Figure 2 Existing Transit Facilities 20
Figure 3 Existing Bicycle Facilities 23
Figure 4 Peak Hour Traffic Volumes and Lane Configurations – Existing (2018) Conditions 28
Figure 5 Existing (2018) Conditions Average Daily Traffic Volumes 30
Figure 6 Peak Hour Traffic Volumes and Lane Configurations – Existing Conditions with Recommended Alternative Geometry/Intersection Configuration 36
Figure 7 Peak Hour Traffic Volumes and Lane Configurations – Future (2035) Conditions with Existing Geometry/Intersection Configuration 38
Figure 8 Peak Hour Traffic Volumes and Lane Configurations – Future (2035) Conditions with General Plan Geometry/Intersection Configuration 40
Figure 9 Peak Hour Traffic Volumes and Lane Configurations – Future (2035) Conditions with Recommended Alternative 42
Figure 10 Future (2035) Average Daily Traffic Volumes (ADT) – Circulation Element Alternative 58
Figure 11 Future (2035) Average Daily Traffic Volumes (ADT) – Recommended Alternative 59

List of Tables

Table 1: Signalized Intersection LOS Criteria 10
Table 2: Unsignalized Intersection Level of Service Definitions 11
Table 3: City of Oceanside Circulation Element Roadway Classifications and LOS Standards 12
Table 4: Urban Street Class and Characteristics 14
Table 5: Peak Hour Roadway Segment LOS Criteria 15
Table 6: Existing (2018) Intersection Level of Service 25
Table 7: Existing (2018) Conditions Roadway ADT Volumes and LOS 27
Table 8: Existing Traffic Speeds 31
Table 9: Future Conditions Intersection Geometric Changes Compared to Existing Conditions 44
Table 10: Intersection Level of Service Summary 49
Table 11: Summary of Deficient Intersection Operations 51
Table 12: Queuing Analysis (2035 With Recommended Alternative) 53
Table 13: Daily Roadway Segment Level of Service Summary 56
Table 14: Summary of Deficient Daily Roadway Segment Operations 57
Table 15: Peak Hour Segment Analysis Summary 61
Table 16: Summary of Deficient Peak Hour Roadway Segment Operations 63
Table 17: HCM 2010 LOS Letter Grade Numerical Equivalents 67
Table 18: Pedestrian Segment LOS Results 69
Table 19: Bicycle Segment LOS Results 71

1.0 EXECUTIVE SUMMARY

The recommendations in the College Boulevard Project Study Area Report (PSR) prepared in 2009 included downgrading the future roadway classification from a six-lane Major Arterial to a four-lane Major Arterial from Waring Road to Olive Drive in the City of Oceanside. However, this recommendation was never integrated into the *Oceanside General Plan: Circulation Element* (2012). Thus, the City's long-range plan continues to designate College Boulevard between Waring Road to Old Grove Road as a six-lane Major Arterial. This report presents the results of the updated transportation impact analysis (TIA) that evaluates projected operations of the PSR's Recommended Alternative refined in the Preliminary Engineering phase. The analysis examines existing and future traffic operations under new baseline years, with performance metrics including: congestion relief, queue lengths, and quality of service for bicyclists and pedestrians along the College Boulevard corridor.

1.1 STUDY AREA & ANALYSIS SCENARIOS

The College Boulevard Improvement Project spans from Plaza Drive Dive to the south to Old Grove Road to the north. With the exception of the segments from Waring Road and Plaza Drive, the 2.7-mile College Boulevard corridor is currently built as a four lane Major Arterial. Per the *Oceanside General Plan: Circulation Element*, the ultimate classification for all segments along College Boulevard within the study area is a six-lane Major Arterial.

Intersection operation impacts at 13 study intersections and daily and peak hour roadway segment operational impacts at eight (8) study segments are evaluated under the following conditions:

- **Existing (2018) Conditions** – the analysis of existing traffic conditions was based on weekday morning (AM) and evening (PM) peak hour intersection volume and daily roadway segment volume collected in mid-September 2018.
- **Existing Conditions with Recommended Alternative** – a hypothetical scenario that isolates the potential impacts of the Recommended Alternative, where segments along College Boulevard between Vista Way and Waring Road and between Olive Drive and Old Grove Drive are widened to six lanes and all other segments along the corridor study area (i.e. north of Waring Road and south of Olive Drive) remain four-lanes, and assesses whether or not the proposed network changes improve existing traffic conditions.
- **Future (2035) Conditions with Existing Geometry/Intersection Configuration** – a scenario that evaluates the operating conditions along College Boulevard to determine if the existing capacity is sufficient to serve the forecasted 2035 volumes derived from the SANDAG Series 12 traffic model.

- **Future (2035) Conditions with General Plan Geometry/Intersection Configuration (Circulation Element Alternative)** – a scenario that evaluates the traffic operating conditions along College Boulevard if it were widened to a six-lane Major Arterial using the forecast 2035 volumes derived from the SANDAG Series 12 model.
- **Future (2035) Conditions with Recommended Alternative** – a scenario that evaluates the traffic operating conditions for the Recommended Alternative (4-lane/6-lane combination) along College Boulevard using the forecast 2035 volumes derived from the SANDAG Series 12 model.

1.2 OPERATIONAL IMPACTS & MITIGATION MEASURES

Below is a summary of the analysis results for the Future (2035) Conditions with Recommended Alternative.

1.2.1 INTERSECTION OPERATIONS ANALYSIS RESULTS

Under the Future (2035) Conditions with Recommended Alternative, all study intersections are forecast to operate within the City of Oceanside's acceptable level of service (LOS) threshold of LOS D during both the AM and PM peak hours.

1.2.2 ROADWAY OPERATIONS ANALYSIS RESULTS

Daily roadway segment analysis for the Future (2035) with the Recommended Alternative scenario, resulted in deficient (LOS E or F) operating conditions along the following five (5) roadway segments:

- Segment #3: College Boulevard from Avenida De La Plata to Oceanside Boulevard
- Segment #4: College Boulevard from Oceanside Boulevard to Olive Drive
- Segment #5: College Boulevard from Olive Drive to Thunder Drive
- Segment #7: College Boulevard from Marvin Street to Waring Road
- Segment #8: College Boulevard from Barnard Drive/Waring Road to Vista Way

However, the peak hour segment analysis revealed acceptable level of service operations under the Future (2035) conditions for Segment #5 and Segment #7. Therefore, based on the peak hour segment analysis, the impact to these segments is less than significant.

Segment #3, Segment #4, and Segment #8 would operate at unacceptable levels of service based on the peak hour segment analysis and daily roadway segment analysis, under both the Future (2035) General Plan and Recommended Alternative scenarios. Therefore, no new segments are forecast to operate deficiently with the Recommended Alternative compared to the General Plan scenario.

Mitigation to improve future roadway segment conditions to acceptable LOS for Segments #3, #4, and #8 would require significant right-of-way to widen the road and result in other secondary impacts, or have limited to no feasible mitigation that would improve the daily or peak hour operations.

However, significant and unavoidable impacts at these segments were already identified in the latest *Oceanside General Plan: Circulation Element* (2012), which includes a statement of overriding consideration for each segment. Therefore, the project does not result in any new impacts not already identified in the General Plan, and no mitigations are proposed.

Overall the findings of the updated traffic analysis for the College Boulevard Improvements Project show that a four-lane section between Olive Drive and Waring Road would serve forecasted 2035 traffic volumes at both the intersection and roadway segment level during peak hour conditions. Therefore, consistent with the original conclusion of the PSR, the six-lane Major Arterial designation of College Boulevard between Olive Drive and Waring Road is still determined to be unnecessary for Future (2035) Conditions.

2.0 INTRODUCTION

This transportation impact analysis (TIA) report presents the results of the study conducted by Fehr & Peers for the proposed College Boulevard Improvements Project located in the City of Oceanside. The purpose of this analysis is to identify the impacts of the proposed project on the surrounding transportation system as part of the Environmental Impact Report (EIR) process. The report includes a description of the assumptions and methods used to conduct the study, as well as a discussion of the results. This transportation impact analysis was conducted in accordance with the guidelines and standards of the City of Oceanside.

2.1 BACKGROUND

College Boulevard is primarily four lanes from Waring Road to Old Grove Road with spot widening near the intersection at Oceanside Boulevard and at Avenida De La Plata. Previous assessments of existing conditions and future 2030 traffic conditions have identified several segments of College Boulevard to be operating at deficient levels of service (i.e. LOS E or F) with daily traffic volumes near or at capacity for the four-lane facility. Thus, to mitigate the deficient operations projected, the 2030 Master Transportation Roadway Plan presented in the City's *General Plan: Circulation Element* proposes widening College Boulevard to six-lanes between Old Grove and Vista Way.

The College Boulevard Project Study Area Report (PSR) was prepared in 2009, which focused on evaluating three possible roadway configurations for the corridor from Waring Road to Old Grove Road to address both traffic flow and community concerns. Of the alternatives analyzed, the Circulation Element classification a as six-lane Major Arterial was determined to result in significant right-of-way issues, and included removal of on-street parking along College Boulevard, as well as removal of structures such as fences. Community members who participated in the PSR workshops expressed concerns about the potential impacts of the potential widening and the impact it would have on their property and quality of life.

Traffic forecasts and operational analysis conducted for the corridor under the PSR's forecast Year 2030 Conditions revealed that traffic volumes dropped off on the southern end of the corridor at Waring Road with a large portion of the traffic headed to and from Mira Costa College on the west side of College Boulevard. Similarly to the north, a large drop in traffic at Olive Drive was projected, where traffic headed into the neighborhoods along the east side of College Boulevard and south on Emerald Drive. Thus, a four-lane section between Waring Road and Thunder Drive would serve the forecasted 2030 traffic volumes and widening through this section was determined to be unnecessary.

Based on the analyses conducted as part of the PSR (e.g. traffic, physical constraints, and financial) and extensive community feedback, a Recommended Alternative was selected and approved by City Council for the College Boulevard corridor. The Recommended Alternative maintains four lanes along the majority of College Boulevard from Waring Road to Old Grove and focuses on widening at key intersections and critical roadway segments such as widening near Waring Road and widening to six lanes from Olive Drive and Avenida De La Plata since these areas were identified as having the highest traffic volumes and were determined to have a need for improvements.

2.2 PROJECT DESCRIPTION

The recommendations in the PSR, including downgrading the future classification from a six-lane Major Arterial to a four-lane Major Arterial from Waring Road to Olive Drive, were not integrated into the latest *Oceanside General Plan: Circulation Element* (2012). Thus, the City's long-range plan continues to designate College Boulevard between Waring Road to Old Grove Road as a six-lane Major Arterial.

This TIA focused on updating the traffic analysis prepared for the Project Study Report, including using SANDAG's Series 12 regional traffic model for future year forecasts. The Series 11 model used in the PSR was updated to Series 12 in 2010 and was the most current model data available when this analysis was conducted.[1] Based on the updated analysis findings, Fehr & Peers further evaluated whether or not the combination of new improvements proposed in the PSR's Recommended Alternative and refined in the Preliminary Engineering would improve existing and future traffic operations, provide congestion relief and reduce queue lengths, and provide improved conditions for bicyclists and pedestrians along the College Boulevard corridor.

Fehr & Peers conducted the following analysis to evaluate the potential benefits and impacts of the Recommended Alternative:

- Operational analysis of corridor conditions (i.e. intersection operations and peak hour and daily roadway segment operations) for five scenarios
- Queuing analysis at critical intersections
- Vehicle miles traveled assessment
- Pedestrian and bicycle analysis

[1] During the timeframe that this study prepared, SANDAG's Series 13: 2050 Regional Growth Forecast was accepted by the SANDAG Board of Directors for planning purposes; however, for the purpose of this study Series 12 was used for future traffic forecasts.

2.3 STUDY AREA

The College Boulevard Improvement Project spans from Plaza Drive to the south to Old Grove Road to the north. With the exception of the segments from Waring Road and Plaza Drive, the 2.7-mile College Boulevard corridor is currently built as a four lane Major Arterial. Per the *Oceanside General Plan: Circulation Element*, the ultimate classification for all segments along College Boulevard within the study area is a six-lane Major Arterial.

The operating conditions were evaluated at the 13 existing intersections listed below and shown on **Figure 1**:

1. College Boulevard/Old Grove Road
2. College Boulevard/Avenida De La Plata
3. College Boulevard/Aztec Street
4. College Boulevard/Oceanside Boulevard
5. College Boulevard/Olive Drive
6. College Boulevard/Thunder Drive
7. College Boulevard/Marvin Street East
8. College Boulevard/Marvin Street West
9. College Boulevard/Roselle Avenue
10. College Boulevard/Barnard Drive/Waring Road
11. College Boulevard/Vista Way
12. College Boulevard/SR-78 Eastbound Off-Ramps
13. College Boulevard/Haymar Drive/Plaza Drive

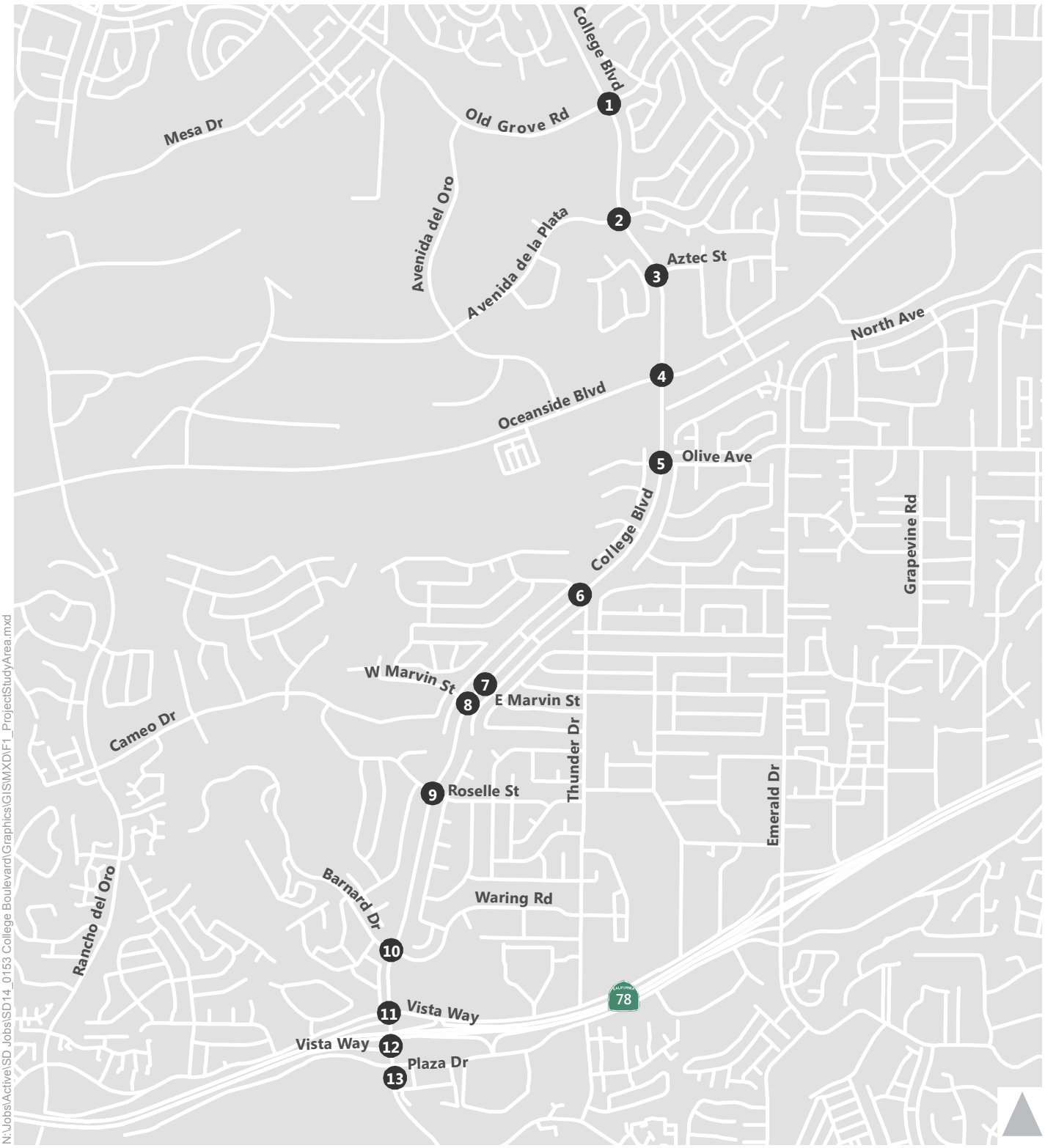
Operating conditions were also evaluated along eight (8) roadway segments within the study area. The analyzed roadway segments are listed below:

1. College Boulevard between Avenida Empressa and Old Grove Road
2. College Boulevard between Old Grove Road and Avenida De La Plata
3. College Boulevard between Avenida De La Plata and Oceanside Boulevard
4. College Boulevard between Oceanside Boulevard and Olive Drive
5. College Boulevard between Olive Drive and Thunder Drive
6. College Boulevard between Thunder Drive and Marvin Street East
7. College Boulevard between Roselle Avenue and Waring Road
8. College Boulevard between Waring Road and Vista Way

2.4 ANALYSIS SCENARIOS

The operations of the study intersections and segments were evaluated for the following scenarios:

- **Existing (2018) Conditions** – The analysis of existing traffic conditions was based on weekday morning (AM) and evening (PM) peak hour intersection volume and daily roadway segment volume collected in mid-September 2018. A field investigation of the existing conditions also verified the geometries and signal controls used in the analysis.
- **Existing Conditions with Recommended Alternative** – Under this scenario, the segments along College Boulevard between Vista Way and Waring Road and between Olive Drive and Old Grove Drive are widened to six lanes. All other segments along the corridor study area (i.e. north of Waring Road and south of Olive Drive) remain four-lanes. Intersection and roadway segment operating conditions were evaluated using the counts collected in November 2018 and the geometries were based on the Preliminary Engineering for the Recommended Alternative.
- **Future (2035) Conditions with Existing Geometry/Intersection Configuration** – Under this scenario, intersection and roadway segment operating conditions were evaluated using existing geometry and the forecasted 2035 volumes derived from the SANDAG Series 12 traffic model for the Recommended Alternative (i.e. 4-lane/6-lane combination) along College Boulevard.
- **Future (2035) Conditions with General Plan Geometry/Intersection Configuration (Circulation Element Alternative)** – Under this scenario, the intersection and roadway segment operating conditions were evaluated using the City's *General Plan: Circulation Element* (2012) designation for College Boulevard as a six-lane Major Arterial. Peak hour and ADT volumes for this scenario were derived from the SANDAG Series 12 traffic model for the six-lane condition along College Boulevard.
- **Future (2035) Conditions with Recommended Alternative** – Under this scenario, the intersection and daily and peak hour roadway segment operating conditions were evaluated using the Preliminary Engineering design of the Recommended Alternative and the volumes derived from the SANDAG Series 12 traffic model for the Recommended Alternative (i.e. 4-lane/6-lane combination along College Boulevard.



Study Intersections

Figure 1

Project Study Area and Intersections

2.5 TRAFFIC ANALYSIS METHODS

The analysis of roadway operations performed for this study is based on procedures presented in the *Highway Capacity Manual* (HCM), published by the Transportation Research Board in 2000. Although the 2010 *HCM* was available at the time this report was published; the HCM 2000 methodology was applied for our analysis considering that the HCM 2010 methodology has limitations for calculating delay for intersections with unique signal timings or intersection configurations. Differences in analysis results for intersection level of service (LOS) evaluation have been found to be negligible between the 2000 and 2010 HCM and are not expected to change the conclusions of this report.

The operations of roadway facilities are described with the term level of service. LOS is a qualitative description of traffic flow based on such factors as speed, travel time, delay, and freedom to maneuver. Six levels are defined from LOS A, with the least congested operating conditions, to LOS F, with the most congested operating conditions. LOS E represents "at-capacity" operations. Operations are designated as LOS F when volumes exceed capacity, resulting in stop-and-go conditions.

2.5.1 SIGNALIZED INTERSECTIONS

The method described in Chapter 16 of the 2000 *Highway Capacity Manual* was used to prepare the LOS calculations for the signalized study intersections. This LOS method analyzes a signalized intersection's operation based on average control delay per vehicle. Control delay includes the initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The average control delay for signalized intersections is calculated using Synchro 8.0 analysis software and is correlated to a LOS designation as shown in **Table 1**.

TABLE 1: SIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Delay in Seconds
A	Progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	≤ 10.0
B	Progression is good, cycle lengths are short, or both. More vehicles stop than with LOS A, causing higher levels of average delay.	> 10.0 to 20.0
C	Higher congestion may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, though many still pass through the intersection without stopping.	> 20.0 to 35.0
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 the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	> 35.0 to 55.0
E	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 occurrences.	> 55.0 to 80.0
F	This level is considered unacceptable with oversaturation, which is when arrival flow rates exceed the capacity of the intersection. This level 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 contributing factors to such delay levels.	> 80.0

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

2.5.2 UNSIGNALIZED INTERSECTIONS

The operations of the unsignalized intersections were evaluated using the method contained in Chapter 17 of the 2000 *Highway Capacity Manual*. LOS ratings for stop-sign-controlled intersections are based on the average control delay expressed in seconds per vehicle. At two-way or side-street-controlled intersections, the average control delay is calculated for each stopped movement, not for the intersection as a whole. For approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. For approaches with multiple lanes, the control delay is computed for each movement; the movement with the worst (i.e., longest) delay is presented. The average control delay for unsignalized intersections is calculated using Synchro 8.0 analysis software and is correlated to a LOS designation as shown in **Table 2**.

TABLE 2: UNSIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Little or no delay.	≤ 10.0
B	Short traffic delay.	> 10.0 to 15.0
C	Average traffic delays.	> 15.0 to 25.0
D	Long traffic delays.	> 25.0 to 35.0
E	Very long traffic delays.	> 35.0 to 50.0
F	Extreme traffic delays with intersection capacity exceeded.	> 50.0

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

2.5.3 ROADWAY SEGMENTS

Roadway segment LOS volume thresholds provide the basis for evaluation of arterial roadway segment performance. The analysis of roadway segment LOS is based on the functional classification of the roadway, the maximum capacity, roadway geometrics, and existing or forecast Average Daily Traffic (ADT) volumes. **Table 3** presents the roadway segment capacity and LOS standards utilized to analyze arterial roadways. This table was developed based on similar standards currently utilized by jurisdictions throughout the San Diego region, and has been approved for use in the City of Oceanside.

These standards are generally used as long-range planning guidelines to determine the functional classification of roadways. The actual capacity of a roadway facility varies according to its physical attributes. Typically, the performance and LOS of a roadway segment is heavily influenced by the ability of the arterial intersections to accommodate peak hour volumes.

TABLE 3: CITY OF OCEANSIDE CIRCULATION ELEMENT ROADWAY CLASSIFICATIONS AND LOS STANDARDS

Roadway Functional Classification	Level of Service				
	A	B	C	D	E
6-Lane Expressway	30,000	42,000	60,000	70,000	80,000
4-Lane Expressway	25,000	35,000	50,000	55,000	60,000
Prime Arterial (6 lanes)	25,000	35,000	50,000	55,000	60,000
6-Lane Major Arterial	20,000	28,000	40,000	45,000	50,000
5-Lane Major Arterial	17,500	24,500	35,000	40,000	45,000
4-Lane Major Arterial	15,000	21,000	30,000	35,000	40,000
Secondary Collector (4 lanes with 2-way left-turn lane (TWLT))	10,000	14,000	20,000	25,000	30,000
Secondary Collector (4 lanes without TWLT, with left turn pockets)	9,000	13,000	18,000	22,000	25,000
Collector (commercial fronting, 2-lanes with TWLT)	5,000	7,000	10,000	13,000	15,000
Collector (residential streets in the Circulation Element or industrial fronting, 2 lanes)	4,000	5,500	7,500	9,000	10,000
Local Street (residential street not in the Circulation Element, 2 lanes)	-	-	2,200	-	-

Source: *Oceanside General Plan: Circulation Element*, 2012.

Per the *Oceanside General Plan: Circulation Element,* the City's minimum acceptable LOS for all roadway segments during the daily period is LOS D. If a roadway is calculated to operate at LOS E or F, then an arterial peak hour analysis will need to be conducted following the 2000 HCM methodology. However, for the purpose of this study roadway peak hour analysis was conducted for all segments under each scenario to further understand the operational characteristics along the corridor that cannot be reflected in the daily segment analysis, regardless of whether or not the daily roadway operation was found to operate unacceptably. The Synchro 8.0 analysis software was used to evaluate the peak hour operations at the study segments.

Peak hour roadway segment LOS is based on the urban street classification and the average travel speed on the roadway segment. **Table 4** describes the characteristics of the four urban street classifications defined in the HCM 2000. The classes are designated by number (i.e. I, II, III, and IV) and reflect combinations of street function and design.

Urban street LOS is based on average through-vehicle travel speed for the segment and is influenced by the number of signals per mile and by the intersection control delay. **Table 5** summarizes the urban street LOS criteria based on average travel speed and urban street class.

2.5.4 LOS STANDARD & SIGNIFICANT IMPACT CRITERIA

Per the *Oceanside General Plan: Circulation Element,* the minimum acceptable operating standard for all roadways is LOS D and the minimum acceptable operating standard for all intersections during the peak periods is LOS D (City of Oceanside, 2012). If the project is expected to degrade the acceptable service levels (LOS D or better) to unacceptable service levels (LOS E or F) along a street segment or at an intersection, then the project is considered to have a significant project-related impact. Alternatively, if the LOS for any roadway element currently operating at LOS E or F without the project and the project adds traffic to this location, causing the delay to increase greater than 2 seconds at an intersection, the volume-to-capacity ratio (V/C) to increase greater than 0.02 on a roadway segment, or decreases average peak hour travel speed by more than one mile per hour then the project would be characterized as a cumulative impact. For roadway segments, daily and peak hour analysis was performed and significant impacts were identified if the LOS is unacceptable for both daily and peak hour conditions. The City's LOS standards and significant impact criteria are considered acceptable within the San Diego Region and consistent with what is presented in the *SANTEC/ITE Guidelines for Traffic Impact Studies (TIS) in the San Diego Region* (2000).

TABLE 4: URBAN STREET CLASS AND CHARACTERISTICS

Urban Street Classification	Design & Functional Category	Characteristics
I	High Speed Principal Arterial	• multilane divided or undivided or a two-lane facility with shoulders • very low driveway/access-point density • separate left turn lanes • no on-street parking • signals spaced no closer than 2 signals/mile • roadside development is low density • speed limits range from 45 to 55 mph.
II	Suburban Principal Arterial	• multilane divided or undivided or a two-lane facility with shoulders • very low driveway/access-point density • separate left turn lanes • no on-street parking • signals spaced at a minimum 1 signal/mile and no closer than 5 signals/mile • roadside development is low to medium density • speed limits range from 40 to 45 mph.
III	Intermediate Minor Arterial	• multilane divided, an undivided one-way, or a two-lane facility • moderate driveway/access-point density • some separate left turn lanes or continuous left-turn lanes • some on-street parking • signals spaced at a minimum 4 signals/mile and no closer than 10 signals/mile • roadside development is medium to moderate density • speed limits range from 30 to 40 mph.
IV	Urban Minor Arterial	• an undivided one-way, or two-way facility with two or more lanes • high driveway/access-point density • few separate left turn lanes • on-street parking usually permitted • signals spaced at a minimum 6 signals/mile and no closer than 12 signals/mile • roadside development is high density • speed limits range from 25 to 35 mph.

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

TABLE 5: PEAK HOUR ROADWAY SEGMENT LOS CRITERIA

Urban Street Classification	I	II	III	IV
Range of Free-Flow Speed (FFS)	55-45 mph	45-35 mph	35-30 mph	35-25 mph
Typical FFS	50 mph	40 mph	35 mph	30 mph
LOS	**Average Travel Speed (mph)**			
A	> 42	> 35	> 30	> 25
B	> 34-42	> 28-25	> 24-30	> 19-25
C	> 27-34	> 22-28	> 18-24	> 13-19
D	> 21-27	> 17-22	> 14-18	> 9-13
E	> 16-21	> 13-17	> 10-14	> 7-9
F	≤ 16	≤ 13	≤ 10	≤ 7

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

2.6 REPORT ORGANIZATION

The remainder of this report is divided into eight chapters, including this Introduction. The existing transportation system serving the study corridor and the current operating conditions of the key intersections and roadway segments are described in **Chapter 3**. **Chapter 4** summarizes the methodologies used to forecast traffic volumes generated by the Recommended Alternative and the Circulation Element Alternative. **Chapter 5** presents the operational analysis of the different corridor conditions and assesses any deficiencies at intersection and roadways along College Boulevard. **Chapter 6** presents the vehicle miles traveled (VMT) assessment conducted for the study scenarios to determine the changes in travel patterns with the project. **Chapter 7** addresses the potential benefits and deficiencies to active transportation modes (i.e. walking and biking) with the College Boulevard Improvements based on the Preliminary Engineering for the Recommended Alternative. Lastly, **Chapter 8** summarizes the finding of the Recommended Alternative transportation impact analysis.

3.0 EXISTING CONDITIONS

This chapter describes the existing roadway network and includes a discussion of the bicycle, pedestrian, and transit facilities located in the project study area. This chapter also includes a discussion of the existing intersection LOS results.

3.1 EXISTING TRANSPORTATION FACILIITIES

A comprehensive data collection effort was undertaken to identify existing transportation conditions in the vicinity of the College Boulevard corridor. The assessment of existing conditions relevant to this study includes an inventory of the street system, traffic volumes on these facilities, and operating conditions at key intersections. Existing public transit service, bicycle facilities, and pedestrian facilities are also described.

3.1.1 EXISTING STREET SYSTEM

The key roadways providing access to the site are described below and are also illustrated on **Figure 1**.

3.1.1.1 North-South Facilities

College Boulevard is a four to six-lane divided roadway from North River Road in the City of Oceanside to south of SR-78 into the City of Carlsbad with posted speed limits ranging from 40 to 50 miles per hour (mph). College Boulevard is currently constructed with four travel lanes within the study area (Old Grove to Vista) except for the section between Waring Road and the south City boundary, where six lanes are currently constructed. Both raised medians and bicycle lanes characterizes the majority of the corridor, while on-street parking is only permitted from just south of West Marvin Street to Thunder Drive.

Old Grove Road is a two-lane to four-lane divided roadway oriented in a generally north-south direction that curve east adjacent to the northern portion of the study area. Old Grove Road extends southeast from SR-76 to east of College Boulevard until it intersects Pine Ridge Road and becomes Temple Heights Drive. The City of Oceanside Circulation Element classifies Old Grove Road as a four-lane Major Arterial.

Thunder Drive is a two-lane roadway oriented in a north-south direction, but curves to an east-west direction west of the study corridor. Thunder Drive extends southward from Wooster Drive to Vista Way. The City of Oceanside Circulation Element classifies Thunder Drive as a two-lane Collector road.

3.1.1.2 East-West Facilities

Oceanside Boulevard is a four-lane to six-lane divided roadway oriented in an east-west direction. Oceanside Boulevard extends east from Coast Highway to the Oceanside-Vista city limit where it becomes West Bobier Drive within the City of Vista. The City of Oceanside Circulation Element classifies Oceanside Boulevard as a four-lane Major Arterial from Coast Highway to El Camino Real, and from College Boulevard to Melrose Drive. From El Camino Real to College Boulevard, Oceanside Boulevard is classified as a six-lane Prime Arterial.

Olive Avenue is a four-lane roadway oriented in an east-west direction. Olive Drive extends eastwards from College Boulevard to Vista Village Drive in the City of Vista. The City of Oceanside Circulation Element classifies Olive Drive as a four-lane Secondary Collector.

Avenida De La Plata is a two-lane roadway with a two-way left turn lane oriented in an east-west direction. It extends from Corporate Center Drive to east of College Boulevard. After crossing College Boulevard, it extends northward until it terminates at Mesa Drive. The City of Oceanside Circulation element classifies Avenida De La Plata as a two-lane Collector road.

Mesa Drive is a two-lane to four-lane roadway with a two-way left turn lane oriented in an east-west direction. Mesa Drive extends eastwards from Mission Avenue to North Santa Fe Avenue. The City of Oceanside Circulation Element classifies Mesa Drive as a four-lane Secondary Collector.

Aztec Street is a two-lane roadway oriented in an east-west direction. Aztec Street extends eastward from Blueridge Street to Comanche Street. Aztec Street is considered a local neighborhood street that provides access to a single family neighborhood to the west and apartment community to the east.

Marvin Street is a two-lane roadway oriented in an east-west direction. Marvin Street extends eastward from Oxford Place to Thunder Drive with an alignment break at College Boulevard. There is also the short eastern segment that extends eastward from Annette Street to Yvonne Street. Marvin Street is considered a local neighborhood street.

Roselle Avenue is a two-lane roadway oriented in an east-west direction and curves to a north-south direction west of Johnson Drive. Roselle Avenue extends eastward from Cameo Drive to Scott Drive. Roselle Drive is considered a local neighborhood street.

Barnard Drive/Waring Road is a three and two-lane roadway that is generally oriented in an east-west direction. To the west of College Boulevard, along Barnard Drive, the roadway has two lanes in the northwest direction and one lane in the southeast direction until it reaches Carr Drive, after which the roadway provides one lane in each direction. Barnard Drive goes on to loop around the Mira Costa College. To the east of

College Boulevard, along Waring Road, the roadway has two-lanes and extends eastward to Morningside Drive where it terminates. The City of Oceanside Circulation Element classifies Barnard Drive/Waring Road as a two-lane Collector road.

Vista Way is a two and four-lane roadway oriented in an east-west direction. Near the study corridor, Vista way provides four-lanes, though it does narrow to two-lanes to the east when it enters Vista, California. Vista Way extends eastward from Walmart Drive to Vista Village Drive. The City of Oceanside Circulation Element classifies Vista Way as a Secondary Collector road.

Haymar Drive/Plaza Drive is a two and four-lane roadway oriented in an east-west direction. To the east of College Boulevard, Plaza Drive extends eastward to Thunder Drive where it goes on into Vista, California as Hacienda Drive. To the west of College Boulevard, Haymar Drive goes into Carlsbad, California where it terminates at a cul-de-sac directly fronting the historical site of Marron Adobe. The City of Oceanside Circulation Element classifies Plaza Drive as a Secondary Collector road.

3.1.2 EXISTING TRANSIT SERVICES

Existing transit service near the study corridor includes bus and light rail services provided by the North County Transit District (NCTD). Although several transit lines cross College Boulevard, only Route 315, Route 323, and Route 325 of the local bus service called the Breeze travel along portions of College Boulevard. NCTD transit routes are described below and illustrated on **Figure 2**.

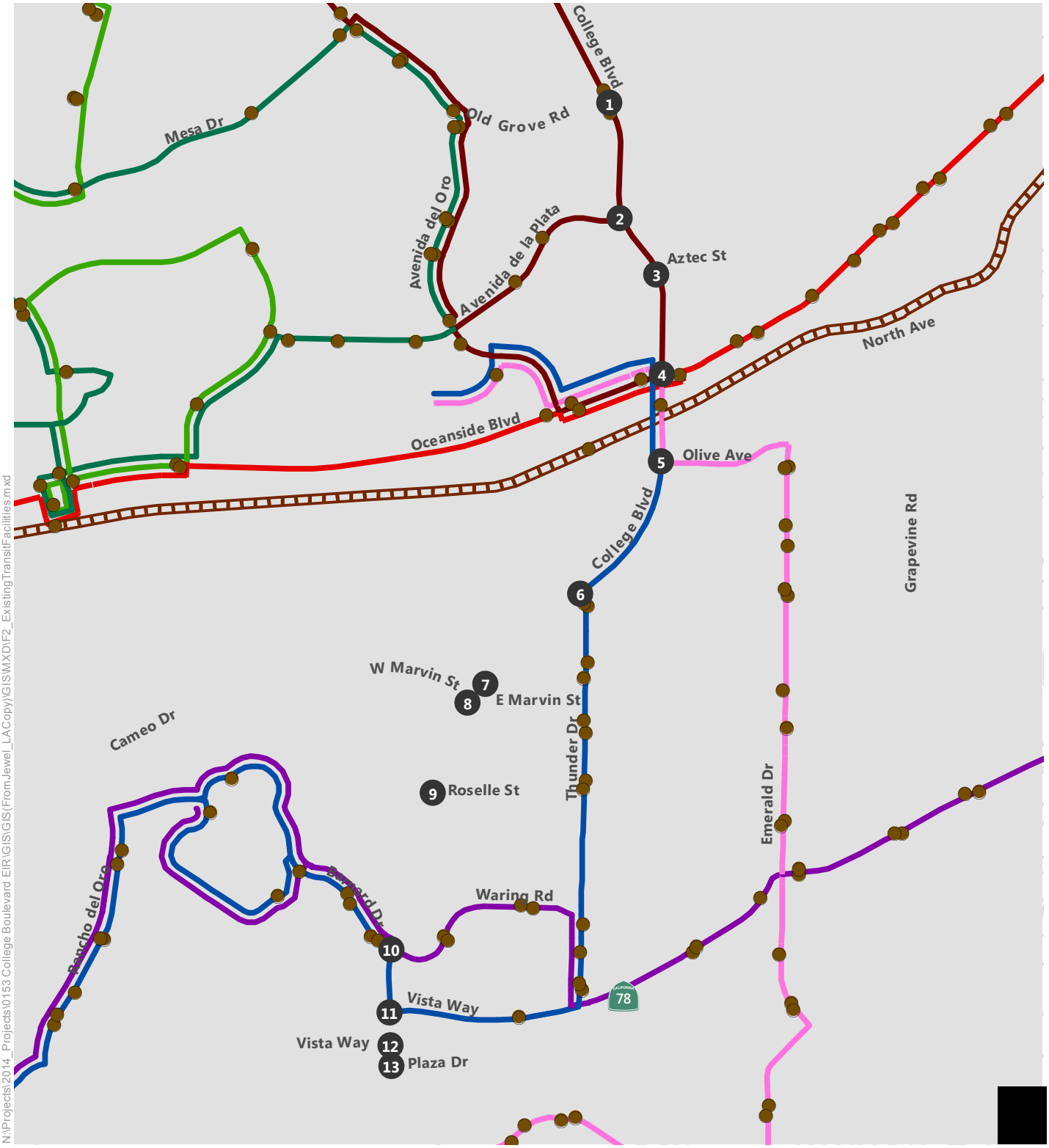
Breeze Route 315 provides daily service from Area 22 on Camp Pendleton and the College Boulevard Sprinter Station. In the study area, the route travels along College Boulevard, west on Avenida de la Plata then south on Avenida Del Oro to the College Boulevard Sprinter Station. After the Sprinter Station, Route 315 travels northbound via Oceanside Boulevard to College Boulevard. Weekday headways are 30 minutes during peak hours and 1 hour during off peak hours. Headways on the weekend and holidays range from 60 to 90 minutes.

Breeze Route 323 provides weekday service from the College Boulevard Sprinter station to Quarry Creek, which is its southern terminus. Route 323 also provide limited service that extends from Quarry Creek to Sage Creek High School. The route traverses the study corridor from Oceanside Boulevard to Olive Drive. The only stop along the study corridor is at College Boulevard/Oceanside Boulevard intersection. Weekday headways range from 60 minutes during peak periods and 120 minutes during off peak hours. Route 323 does not operate on weekends or holidays.

Breeze Route 325 provides daily service excluding Sundays and holidays from Carlsbad Village to the College Boulevard Sprinter Station. The route travels on the study corridor from Oceanside Boulevard to

Thunder Drive and from Vista Way to Barnard Drive/Waring Road. The only stop within the study corridor is located at the College Boulevard/Oceanside Boulevard intersection. Weekday headways range from 20 to 40 minutes and Saturday headways are 60 minutes.

The **Sprinter** is a light rail line serving a total of 15 stations in the cities of Oceanside (western terminus), Vista, San Marcos, and Escondido (eastern terminus). The line provides service to Palomar College and California State University, San Marcos. At the Oceanside Transit Center, the Sprinter connects to three regional rail lines including the Coaster, Metrolink, and well as to Amtrak's Pacific Surfliner. The Sprinter runs every 30 minutes in both east and west directions Monday through Friday, from approximately 4 AM to 9 PM. Trains run later on Friday and Saturday evenings to approximately 10:30 pm (westbound to Oceanside), and to approximately 11:30 PM (eastbound to Escondido). On weekends and holidays the trains operate every 60 minutes with the exception of the 10 AM to 6 PM period where trains operate every 30 minutes. The College Boulevard Sprinter Station is located west the study corridor at Oceanside Boulevard of and is within walking distance (0.25 miles) of College Boulevard.



N:\Projects\2014_Projects\0153 College Boulevard EIR\GIS\GIS(FromJewel_LACopy)\GIS\MXD\F2_ExistingTransitFacilities.mxd

[redacted]

Study Intersections

Transit Routes

302 315 318 325

311 316 323 399 (NCTD Sprinter) Transit Stop

[redacted]

Figure 2

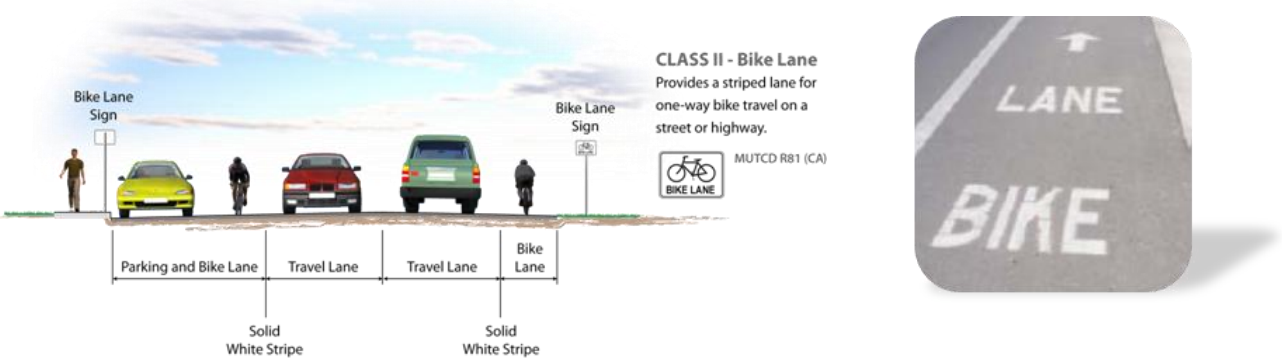
Existing Transit Facilities

3.1.3 EXISTING BICYCLE FACILITIES

Bicycle facilities generally consist of three types of facilities, which are outlined below:

- *Bike or Shared Use Paths* provide a completely separate right-of-way and is designated for the exclusive use of bicycles and pedestrians with vehicle and pedestrian cross-flow minimized. Generally, the recommended pavement width for a two-directional shared use path is ten (10) feet.

- *Bike Lanes* provide a restricted right-of-way and are designated for the use of bicycles with a striped lane on a street or highway. Bicycle lanes are generally five (5) feet wide. Adjacent vehicle parking and vehicle/pedestrian cross-flow are permitted.



- *Bike Route or Signed Shared Roadways* provide for a right-of-way designated by signs or shared lane pavement markings, or "sharrows," for shared use with pedestrians or motor vehicles.

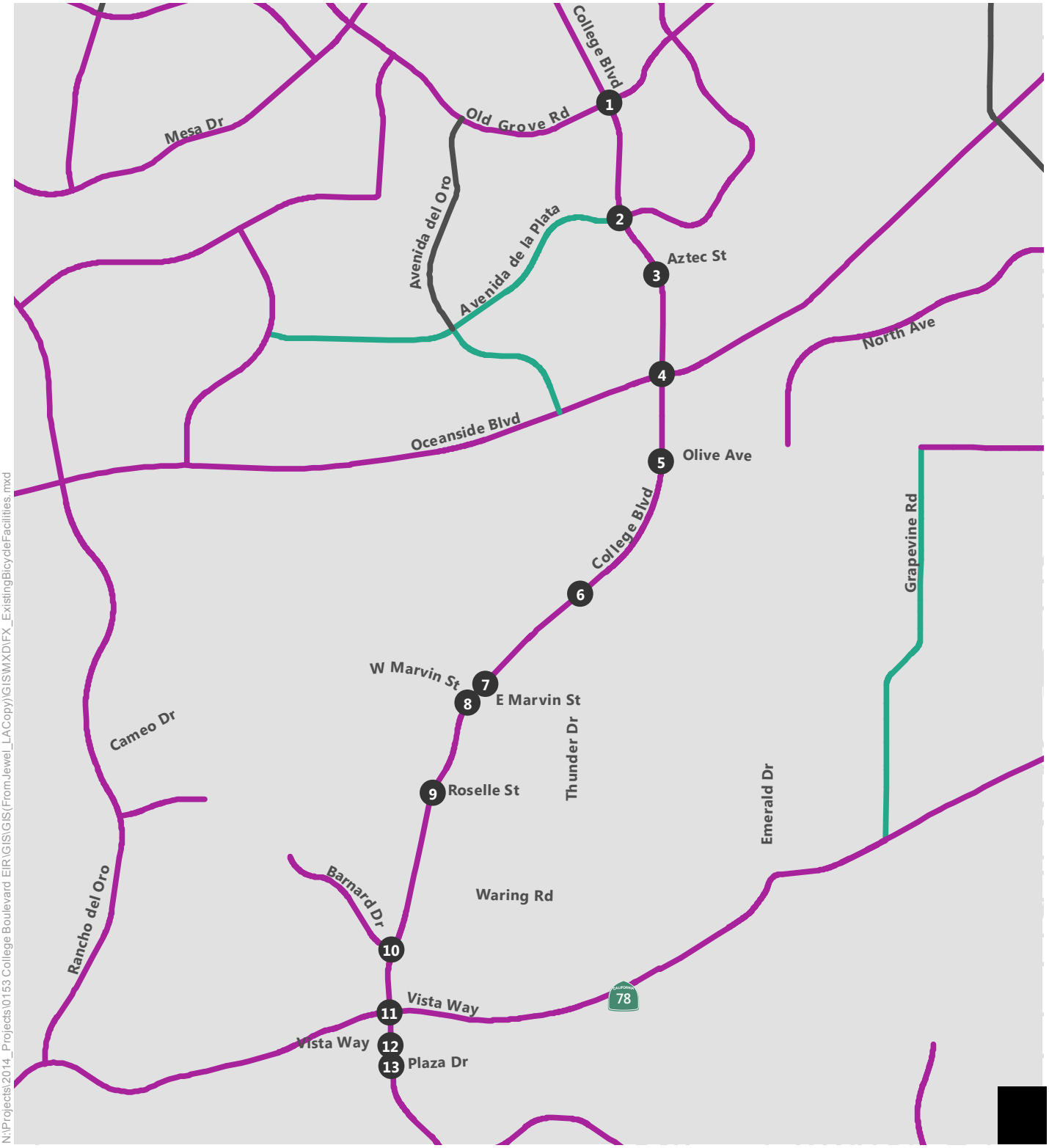
The City of Oceanside is recognized by the League or American Bicyclists as a Bicycle Friendly Community, with approximately nine miles of bike paths, 17 miles of bike routes, and 70 miles of bike lanes. All along the College Boulevard study corridor, there are dedicated Class II bicycle lanes in both the northbound and southbound directions. East-west roadways intersecting College Boulevard that provide Class II bicycle lanes include Old Grove Road, Avenida De La Plata, Oceanside Boulevard, Barnard Drive, and Vista Way. Existing bicycle facilities are shown on **Figure 3**.

3.1.4 EXISTING PEDESTRIAN FACILITIES

Existing pedestrian access is provided via four (4) to six (6) foot wide sidewalks along the east and west side of College Boulevard. There is a gap in the sidewalk along the west side of the street from Vista Way to Haymar Drive/Plaza Drive.

Study intersections with pedestrian facilities are described below:

1. College Boulevard/Old Grove Road
    - Signalized intersection with marked crosswalks and push buttons on all legs
2. College Boulevard/Avenida De La Plata
    - Signalized intersection with marked crosswalks and push buttons on the east, west, and south legs
4. College Boulevard/Oceanside Boulevard
    - Signalized intersection with marked crosswalks and push buttons on all legs
5. College Boulevard/Olive Avenue
    - Signalized intersection with marked crosswalks and push buttons on all legs
6. College Boulevard/Thunder Drive
    - Signalized intersection with marked crosswalks and push buttons on all legs
8. College Boulevard/West Marvin Street
    - Signalized intersection with a marked crosswalk on the north leg and push buttons on both the north and west legs
9. College Boulevard/Roselle Avenue
    - Signalized intersection with push buttons on all legs
10. College Boulevard/Barnard Drive/Waring Road
    - Signalized intersection with marked crosswalks and push buttons on the west, east, and south legs
11. College Boulevard/Vista Way
    - Signalized intersection with marked crosswalks and push buttons on the west, east, and north legs
13. College Boulevard/Haymar Drive/Plaza Drive
    - Signalized intersection with marked crosswalks and push buttons on west, east, and south legs.



Study Intersections

Bicycle Facilities

Bike Route

Bike Lane

Other Suggested Routes

Figure 3

Existing Bicycle Facilities

3.2 EXISTING INTERSECTION VOLUMES AND LANE CONFIGURATIONS

The operations of the 13 study intersections were evaluated during weekday morning (7:00 to 9:00 AM) and weekday evening (4:00 to 6:00 PM) peak period conditions. Traffic counts were collected during the weekday AM and PM peak periods at the study intersections in mid-September 2018, when local schools were in session.

Due to the close spacing between the study intersections (less than one mile), a system-wide AM peak hour and a system-wide PM peak hour were used for the intersection analysis.. The absolute peak hour time periods for most intersections were consistent with the 7:00-8:00 AM system-wide peak hour and the 4:30-5:30 PM system-wide peak hour. The system-wide peak hour factors used in the AM and PM peak hour intersection analyses were respectively calculated based on these system-wide peaks. As a result, an AM peak hour factor of 0.92 and a PM peak hour factor of 0.96 were applied in the intersection LOS analysis.

Existing lane configurations and signal controls were obtained through field observations. Signal timings were provided by the City of Oceanside and Caltrans staff. **Figure 4** presents the existing AM and PM peak-hour turning movement volumes, corresponding lane configurations, and traffic control devices. Traffic count data sheets are provided in **Appendix A**.

3.3 EXISTING INTERSECTION OPERATIONS

Existing peak hour volumes and lane configurations were used to calculate levels of service for each of the 13 study intersections. The results of the existing LOS analysis are presented in **Table 6** and the corresponding LOS calculation sheets are included in **Attachment B**.

The results of the LOS calculations indicate that the existing study intersections operate at an overall acceptable service level (LOS D or better), with the exception of the following locations:

4. College Boulevard/Oceanside Boulevard (LOS E during the AM peak hour)
11. College Boulevard/Vista Way (LOS E during the PM peak hour).

TABLE 6: EXISTING (2018) INTERSECTION LEVEL OF SERVICE

Intersection	Traffic Control	Peak Hour	Delay (sec/veh)[1]	LOS[2,3]
1. College Boulevard/Old Grove Road	Signalized	AM	31.9	C
		PM	26.3	C
2. College Boulevard/Avenida De La Plata	Signalized	AM	16.4	B
		PM	17.6	B
3. College Boulevard/Aztec Street	SSSC	AM	15.2	C
		PM	25.8	D
4. College Boulevard/Oceanside Boulevard	Signalized	AM	**64.2**	**E**
		PM	53.0	D
5. College Boulevard/Olive Drive	Signalized	AM	25.0	C
		PM	32.1	C
6. College Boulevard/Thunder Drive	Signalized	AM	19.1	B
		PM	23.7	C
7. College Boulevard/Marvin Street East	SSSC	AM	10.4	B
		PM	14.3	B
8. College Boulevard/Marvin Street West	Signalized	AM	12.4	B
		PM	8.2	A
9. College Boulevard/Roselle Avenue	Signalized	AM	12.0	B
		PM	11.6	B
10. College Boulevard/Barnard Drive/Waring Road	Signalized	AM	31.2	C
		PM	30.2	C
11. College Boulevard/Vista Way	Signalized	AM	38.3	D
		PM	**74.6**	**E**

TABLE 6: EXISTING (2018) INTERSECTION LEVEL OF SERVICE

Intersection	Traffic Control	Peak Hour	Delay (sec/veh)[1]	LOS[2,3]
12. College Boulevard/SR-78 Eastbound Off-Ramps	Signalized	AM	13.7	B
		PM	14.1	B
13. College Boulevard/Haymar Drive/Plaza Drive	Signalized	AM	20.3	C
		PM	41.2	D

Source: Fehr & Peers, 2018.

Notes:

[1] Whole intersection weighted average stopped delay expressed in seconds per vehicle for signalized intersections. The vehicular delay for the worst movement is reported for side-street stop-controlled intersections (SSSC).

[2] LOS calculations performed using the *2000 Highway Capacity Manual (HCM)* method.

[3] Unacceptable seconds of delay per vehicle and LOS highlighted in **bold.**

3.4 EXISTING ROADWAY SEGMENT OPERATIONS

Average daily traffic (ADT) volumes were collected for the study roadway segments in mid-September 2018 and are illustrated on **Figure 5**. **Table 7** displays the LOS analysis for the key corridor study area roadway segments under Existing Conditions. As shown in the table, the study roadway segments currently operate at LOS D or better, with the exception of the following:

- College Boulevard between Old Grove Road & Avenida De La Plata (LOS E)
- College Boulevard between Avenida De La Plata and Oceanside Boulevard (LOS E)
- College Boulevard between Oceanside Boulevard and Olive Drive (LOS F)
- College Boulevard between Olive Drive & Thunder Street East (LOS E)

TABLE 7: EXISTING (2018) CONDITIONS ROADWAY ADT VOLUMES AND LOS

Roadway Segment	Existing Cross-Section	LOS E Capacity	Existing Average Daily Traffic (ADT)	Volume-to-Capacity (V/C)	Existing LOS
1. College Boulevard between Avenida Empressa & Old Grove Road	4-Lane Major Arterial w/ raised median	40,000	29,875	0.747	C
2. College Boulevard between Old Grove Road & Avenida De La Plata	4-Lane Major Arterial w/ raised median	40,000	**38,215**	**0.955**	**E**
3. College Boulevard between Avenida De La Plata & Oceanside Boulevard	4-Lane Major Arterial w/ raised median	40,000	**36,971**	**0.924**	**E**
4. College Boulevard between Oceanside Boulevard & Olive Drive	4-Lane Major Arterial w/ raised median	40,000	**49,943**	**1.249**	**F**
5. College Boulevard between Olive Drive & Thunder Drive	4-Lane Major Arterial w/ raised median	40,000	**35,917**	**0.898**	**E**
6. College Boulevard between Thunder Drive & Marvin Street East	4-Lane Major Arterial w/ raised median	40,000	31,746	0.794	D
7. College Boulevard between Marvin Street & Barnard Drive/Waring Road	4-Lane Major Arterial w/ raised median	40,000	32,778	0.819	D
8. College Boulevard between Barnard Drive/Warring Road & Vista Way	6-Lane Major Arterial, Divided	50,000	44,216	0.884	D

Source: Fehr & Peers, 2018.

Notes:

[1]Deficient roadway segment operations highlighted in **bold.**

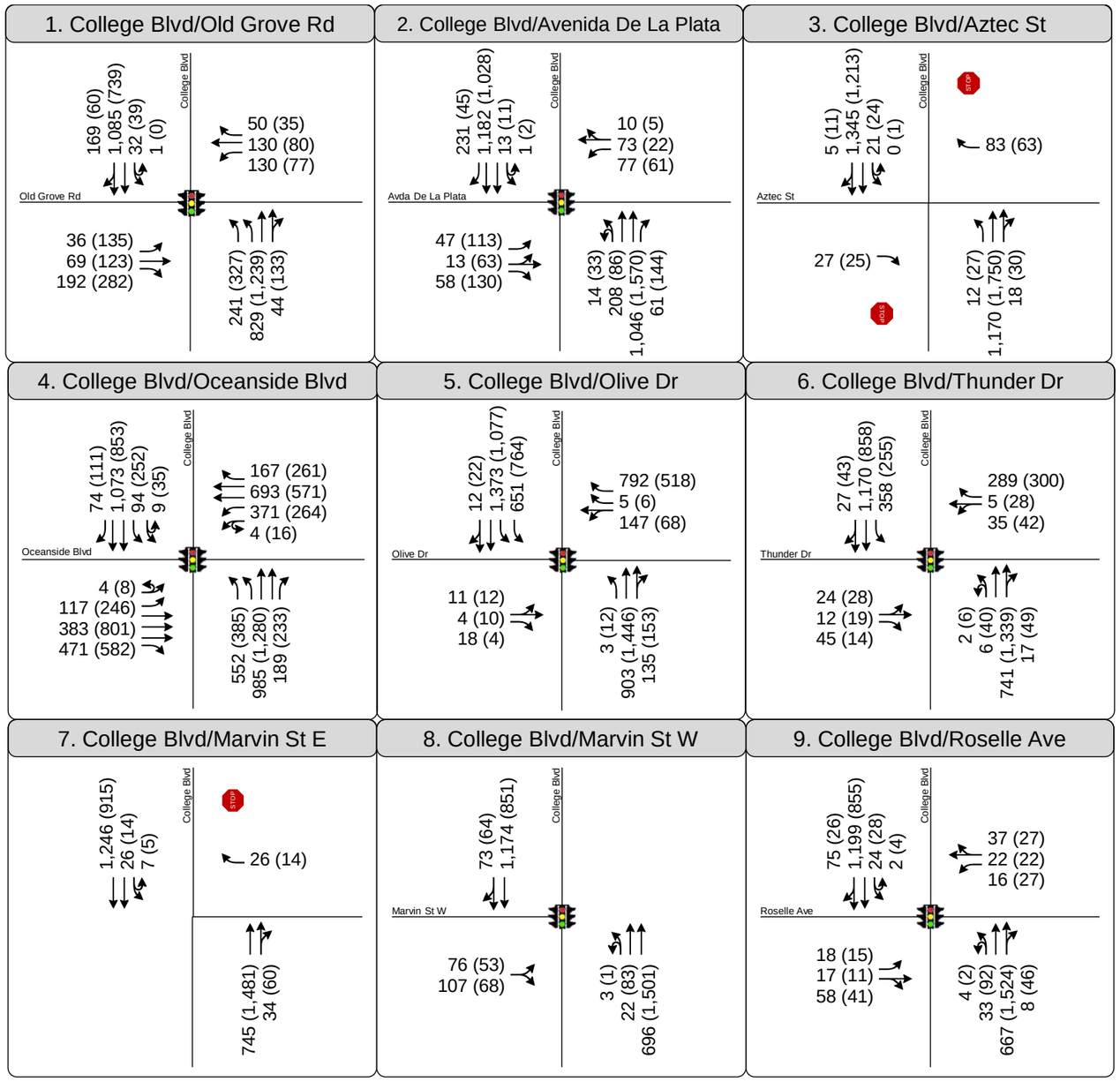


Figure 4

Peak Hour Traffic Volumes and Lane Configurations
Existing (2018) Conditions

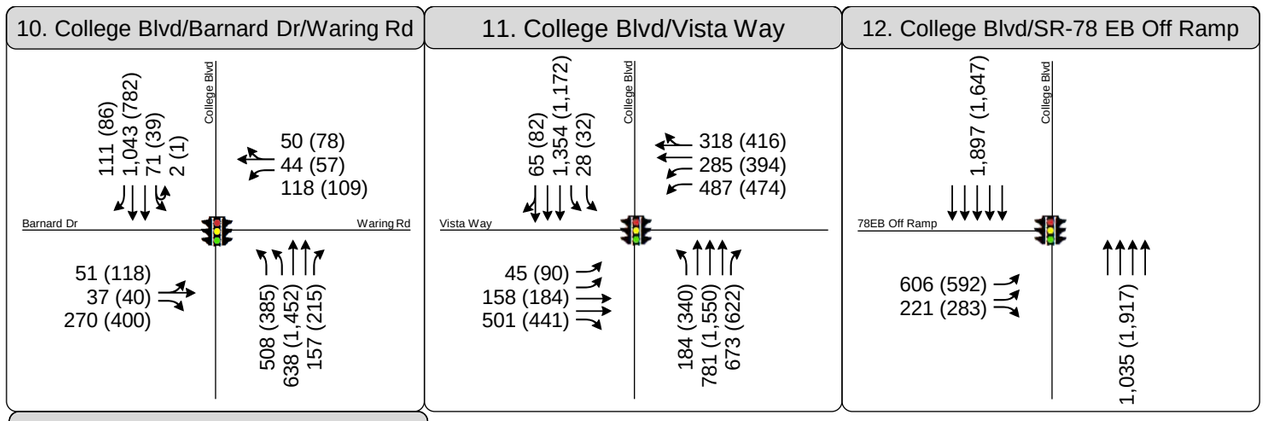
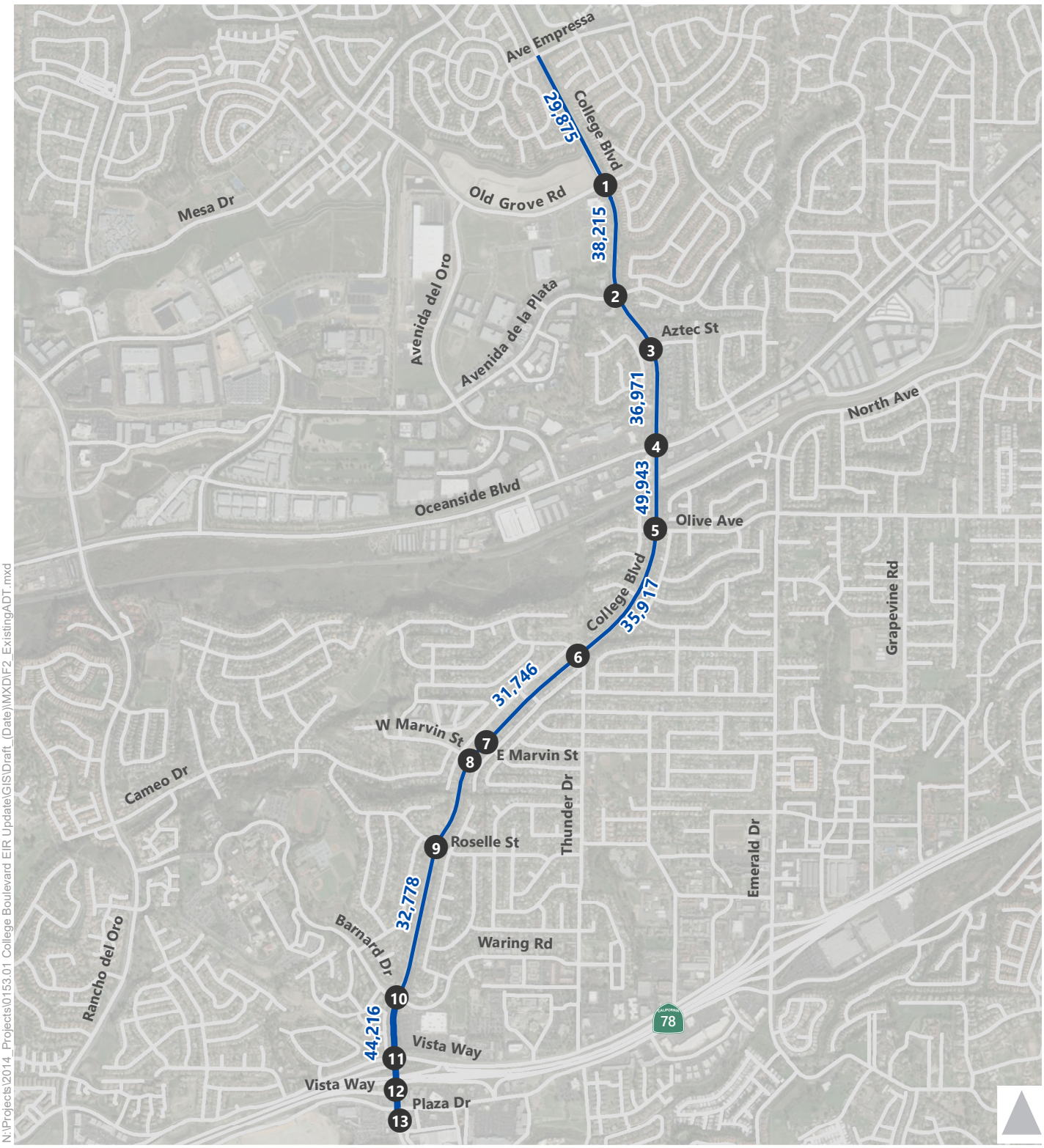


Figure 4

Peak Hour Traffic Volumes and Lane Configurations
Existing (2018) Conditions



Study Intersections

4-Lane Major Arterial with Raised Median

6-Lane Major Arterial, Divided

Figure 5

Existing (2018) Average Daily Traffic (ADT) Volumes

3.5 SPEED DATA

In conjunction with the daily traffic counts, speed data was collected along the eight (8) study roadway segments over the course of a 24-hour period and are provide in **Appendix A**. The speed surveys were used to determine the 85th percentile and average speeds, which are shown by segment in **Table 8.**

TABLE 8: EXISTING TRAFFIC SPEEDS

Segment	Direction (Posted Speed Limit)	85th Percentile (mph)[1]	Average Speed (mph)[1]
1. College Boulevard between Avenida Empressa & Old Grove Road	Northbound (50 mph)	54	48
	Southbound (50 mph)	54	47
2. College Boulevard between Old Grove Road & Avenida De La Plata	Northbound (45 mph)	46	40
	Southbound (45 mph)	50	44
3. College Boulevard between Avenida De La Plata & Oceanside Boulevard	Northbound (45 mph)	50	45
	Southbound (45 mph)	49	41
4. College Boulevard between Oceanside Boulevard & Olive Drive	Northbound (45 mph)	39	29
	Southbound (45 mph)	43	35
5. College Boulevard between Olive Drive & Thunder Drive	Northbound (45 mph)	49	39
	Southbound (45 mph)	51	45
6. College Boulevard between Thunder Drive & East Marvin Street	Northbound (40 mph)	49	43
	Southbound (40 mph)	49	43
7. College Boulevard between Marvin Street & Barnard Drive/Waring Road	Northbound (50 mph)	54	47
	Southbound (50 mph)	53	46
8. College Boulevard between Barnard Drive/Waring Road & Vista Way	Northbound (35 mph)	39	32
	Southbound (35 mph)	38	29

Source: Fehr & Peers, 2018.

Notes:

[1] Based on traffic speed data collected over a 24-hour period.

As shown in **Table 8**, the 85th percentile speeds along most of the College Boulevard corridor are five miles per hour (5 mph) above or below the posted speed limit in both directions. The two segment exceptions are Segment #4: College Boulevard between Oceanside Boulevard & Olive Drive and Segment #6: College Boulevard between Thunder Drive & East Marvin Street. The 85th percentile speed for the segment of College Boulevard between Oceanside Boulevard and Olive Drive is 39 mph in the northbound direction, which is 6 mph below the posted speed limit of 45 mph. Since speed limits are based on the study of "free-flow" traffic speeds, the 85th percentile speeds that fall significantly below the posted speed are indicators of non-free flow conditions or congestion. For this particular segment, the lower northbound speeds along Segment #4: College Boulevard between Oceanside Boulevard & Olive Drive is likely due to the at-grade railroad crossing mid-block.

4.0 FUTURE FORECAST MODEL METHODOLOGY

To understand the future traffic operating conditions along College Boulevard, the SANDAG Series 12 traffic model was used to forecast Year 2035 volumes for the Recommended Alternative (i.e. 4-lane/6-lane combination) and the Circulation Element Alternative (i.e. the six lane condition/off-shelf model). Prior to generating future volumes, Fehr & Peers worked closely with SANDAG and City of Oceanside staff in refining the Series 12 model for use on this project. Steps taken to refine the model included:

- Comparing ADT volume and land use from the Series 11 model and the Series 12 model to identify inconsistencies
- Evaluating land use in the model to determine if changes in land use were causing the forecast increase in ADT along specific segments of College Boulevard
- Evaluating ADT volumes and processing methods within the model (established by SANDAG) used to forecast the adjusted ADT volume in the model
- Refining baseline assumptions within the model to correct errors in the adjustment process within the SANDAG model
- Re-running the model with adjusted conditions for the Future (2035) Conditions with Recommended Alternative and Future (2035) Conditions with General Plan Configuration (i.e. four lane and six lane conditions, respectively)
- Post-processing the model volumes for use in the analysis

Through this process, it was determined that segments of College Boulevard from Old Grove to Olive Drive were forecast to have significantly higher volumes in the Series 12 model to volumes forecast in previous versions of the SANDAG model. The source of the higher volumes were determined to be changes in land use trip generation rates for retail uses and processing methods established by SANDAG for use in Oceanside. The trip generation rates were not adjusted for the corridor, but corrections were made to the processing methods that brought the volumes along College Boulevard through this section closer to volumes previously reported for future conditions.

Once the volumes from the model were refined, the difference method to calculate the ADT volumes for the roadway segments was applied and the resulting volumes were rounded to the nearest hundred. The difference method calculates the difference in ADT volume from the 2008 SANDAG calibration model to the 2035 forecast model and adds the difference to 2014 actual counts. These resulting volumes are also rounded to the nearest hundred.

The refined daily traffic volumes were then used to calculate 2035 peak hour intersection volumes by calculating the daily roadway volume growth between the base year and future year model and distributing

the growth proportionally using the existing intersection turning movement counts. Overall, the growth in traffic through each study intersection is based on changes in daily traffic volumes, changes in traffic patterns identified in the traffic model, and engineering judgment. Post-processed peak hour volumes were rounded to the nearest ten and used in the intersection operations analysis.

It should also be noted that the Series 12 traffic model used in this study includes the SR-78/Rancho del Oro interchange, which is currently included in the City's *Circulation Element*. Thus, the forecasted 2035 volumes reflect the traffic conditions associated with the completion of the SR-78/Rancho del Oro interchange that would be located southwest of the corridor study area. Therefore, traffic volumes could be higher on College Boulevard (particularly south of Waring Road) if the Rancho del Oro interchange is not implemented.

Per the request of City of Oceanside, intersection and roadway segment operations of the Future Year (2035) Conditions with the Recommended Alternative without the SR-78/Rancho del Oro interchange was evaluated and used to assess how the traffic patterns shift without the construction of the new interchange would affect operations along College Boulevard. Details of this alternative scenario analysis are summarized in **Appendix C.**

Overall, the results of the "without Rancho del Oro Interchange" included the following affects to traffic patterns:

- increase in ADT on Vista Way and SR-78 between Rancho del Oro and College Boulevard (up to 36%)
- increase in ADT on College Boulevard south of Waring (up to 15%)
- decrease in ADT on College Boulevard north of Waring Road (up to 15%)
- decrease in ADT on Rancho del Oro (up to 38%)

The analysis indicated that up to 36 percent of ADT would shift from Rancho del Oro/SR-78 to College Boulevard/SR-78. The forecasted shift in traffic would result in an increase in ADT on Vista Way, SR-78, and College Boulevard south of Waring Road, and a decrease along College Boulevard north of Waring Road.

5.0 OPERATIONAL ANALYSIS OF CORRIDOR CONDITIONS

Using the existing conditions data and volumes forecast using the SANDAG Series 12 model, the intersection and roadway segment operations for the following conditions (in addition to the Existing Conditions) have been evaluated and the analysis results are discussed in this chapter:

- **Existing (2018) Conditions with Recommended Alternative** – a hypothetical scenario that isolates the potential impacts of the recommended 4-lane/6-lane combination for College Boulevard and assesses whether or not the proposed network changes improve existing traffic conditions.
- **Future (2035) Conditions with Existing Geometry/Intersection Configuration** – a scenario that evaluates the operating conditions along College Boulevard to determine if the existing capacity is sufficient to serve the forecasted 2035 volumes derived from the SANDAG Series 12 traffic model.
- **Future (2035) Conditions with General Plan Geometry/Intersection Configuration (Circulation Element Alternative)** – a scenario that evaluates the traffic operating conditions along College Boulevard if it were widened to a six-lane Major Arterial using the forecast 2035 volumes derived from the SANDAG Series 12 model.
- **Future (2035) Conditions with Recommended Alternative** – a scenario that evaluates the traffic operating conditions for the Recommended Alternative (4-lane/6-lane combination) along College Boulevard using the forecast 2035 volumes derived from the SANDAG Series 12 model.

Figures 6 through 9 illustrate the AM and PM peak hour turning movement volumes, corresponding lane configurations, and traffic control devices assumed for the analysis of the study scenarios outlined above.

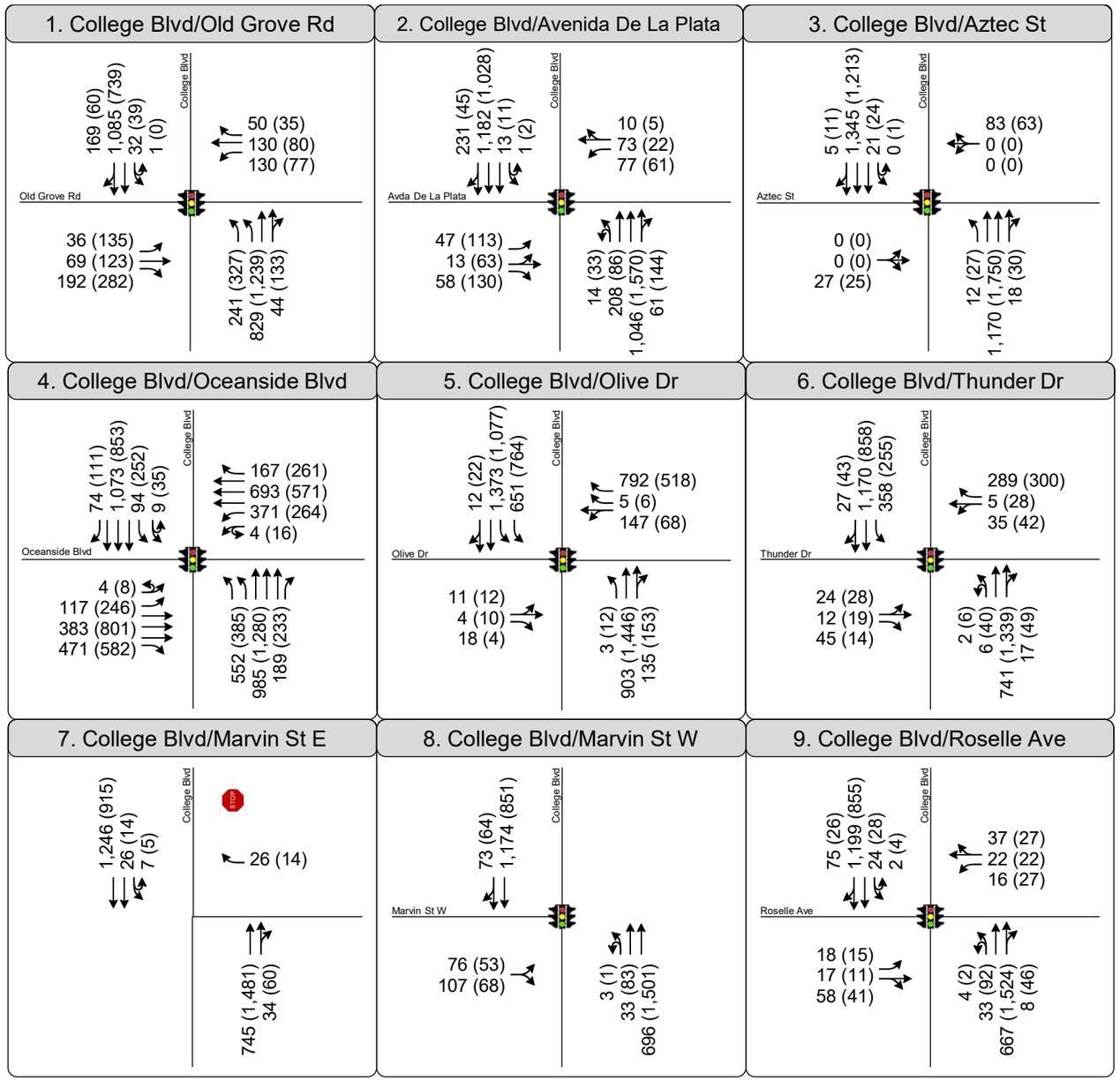
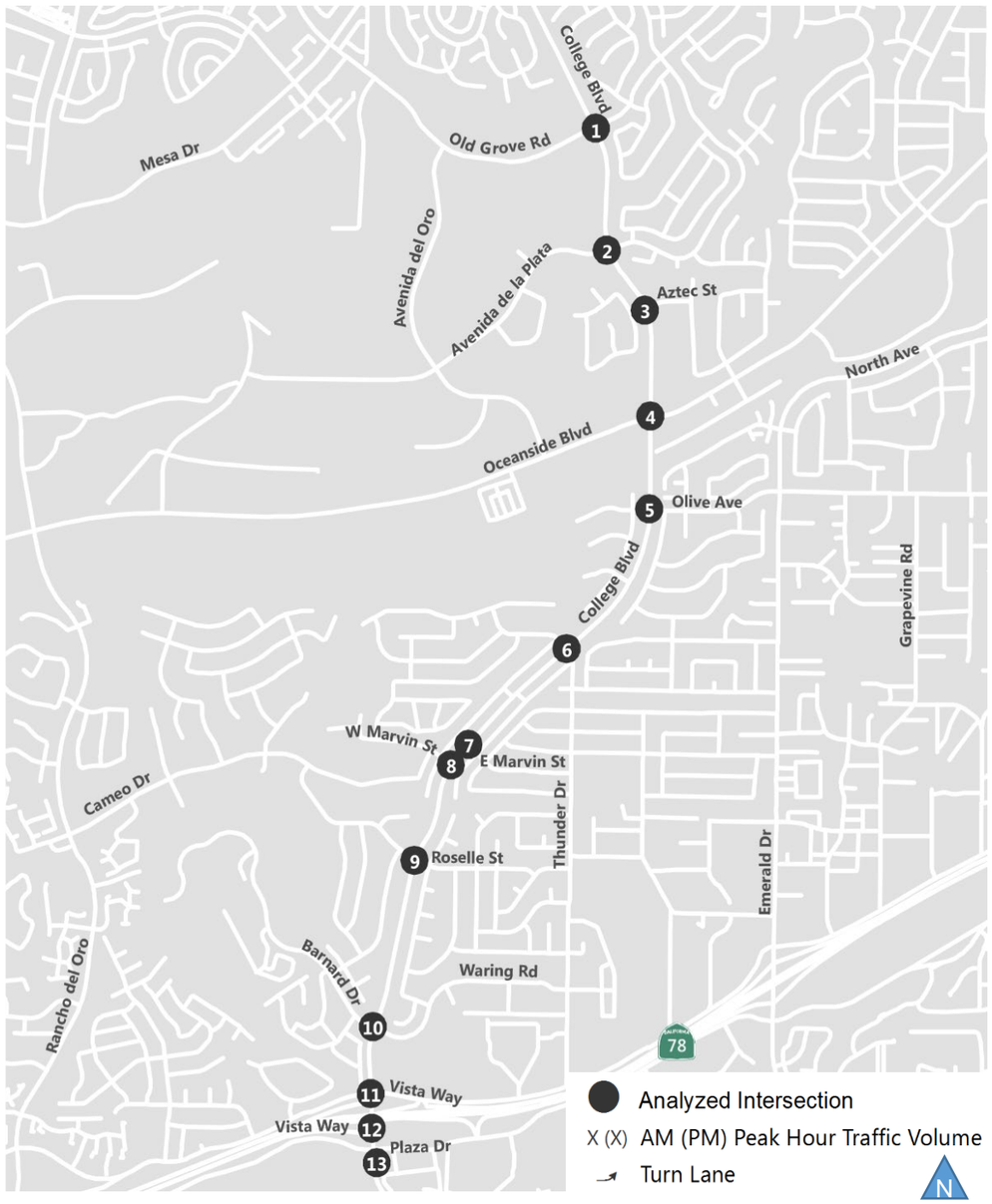


Figure 6

Peak Hour Traffic Volumes and Lane Configurations
Existing Conditions with Recommended Alternative Geometry/Intersection Configuration



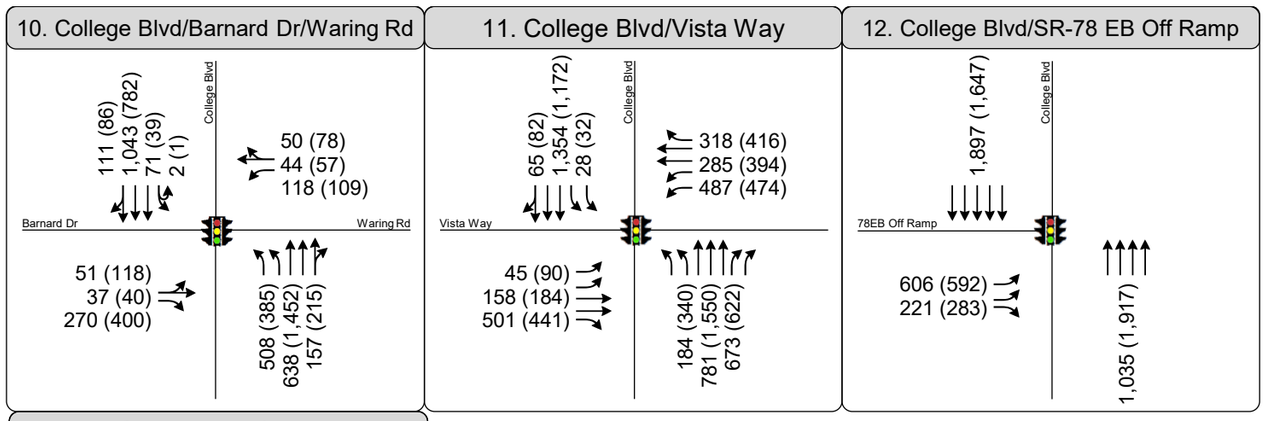


Figure 6

Peak Hour Traffic Volumes and Lane Configurations
Existing Conditions with Recommended Alternative Geometry/Intersection Configuration

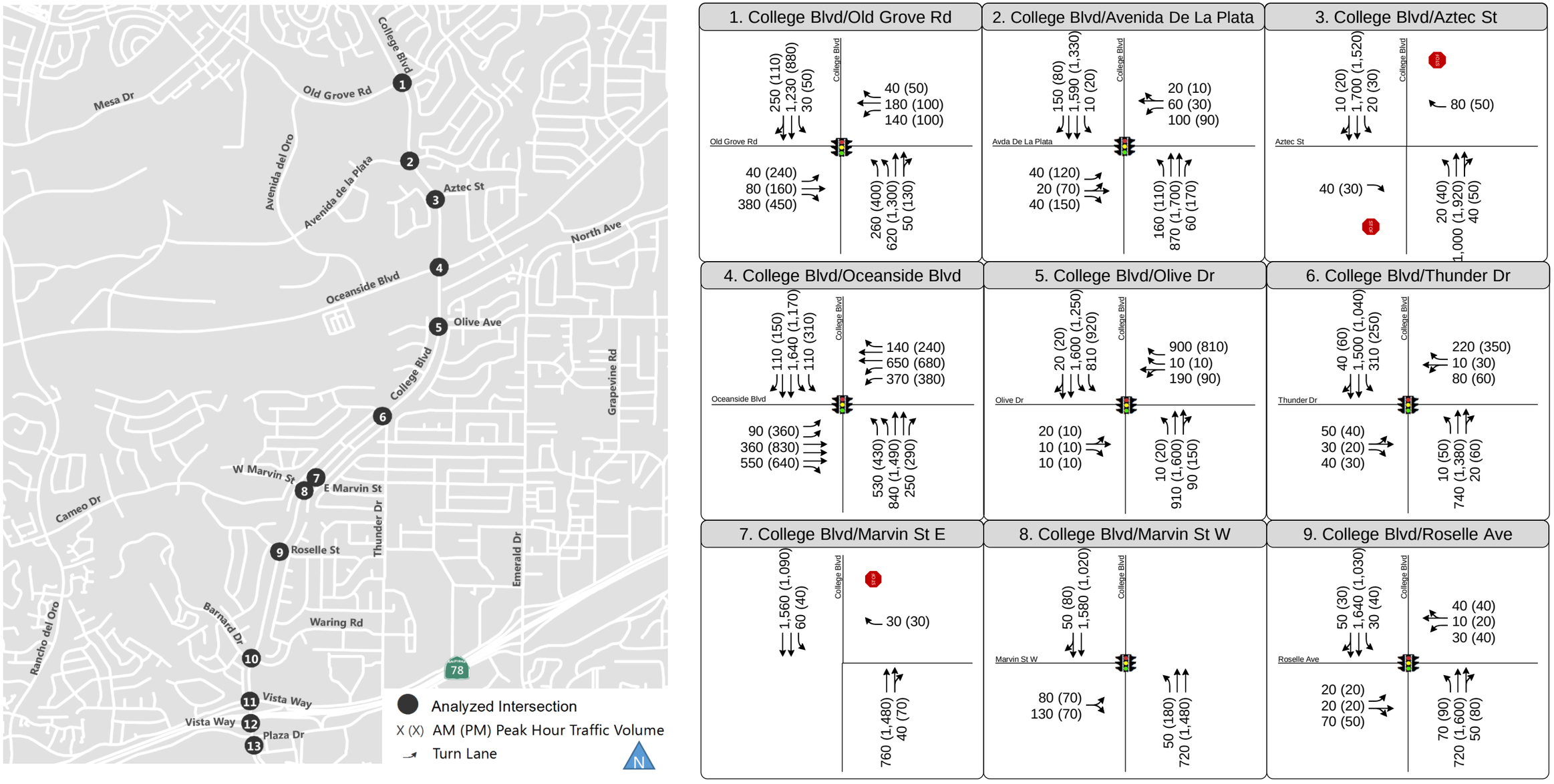


Figure 7

Peak Hour Traffic Volumes and Lane Configurations
Future (2035) Conditions with Existing Geometry/Intersection Configuration

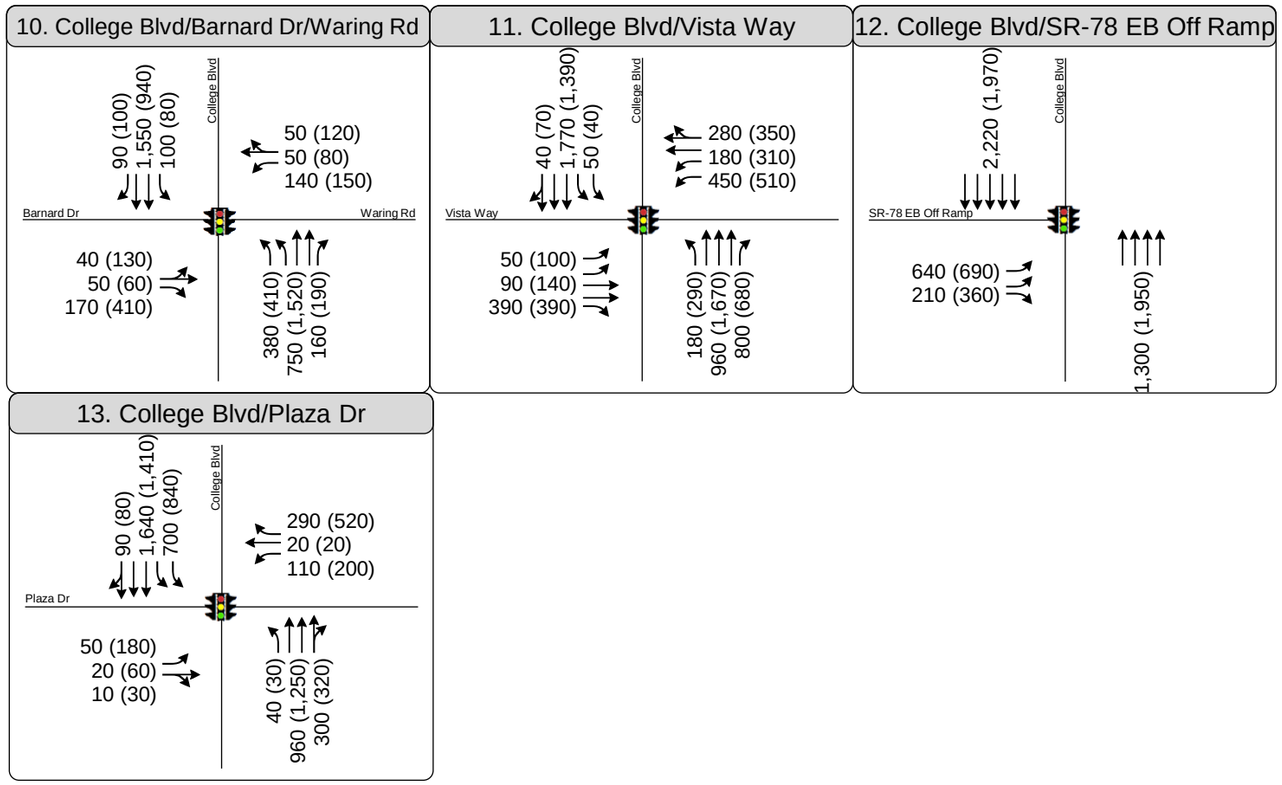
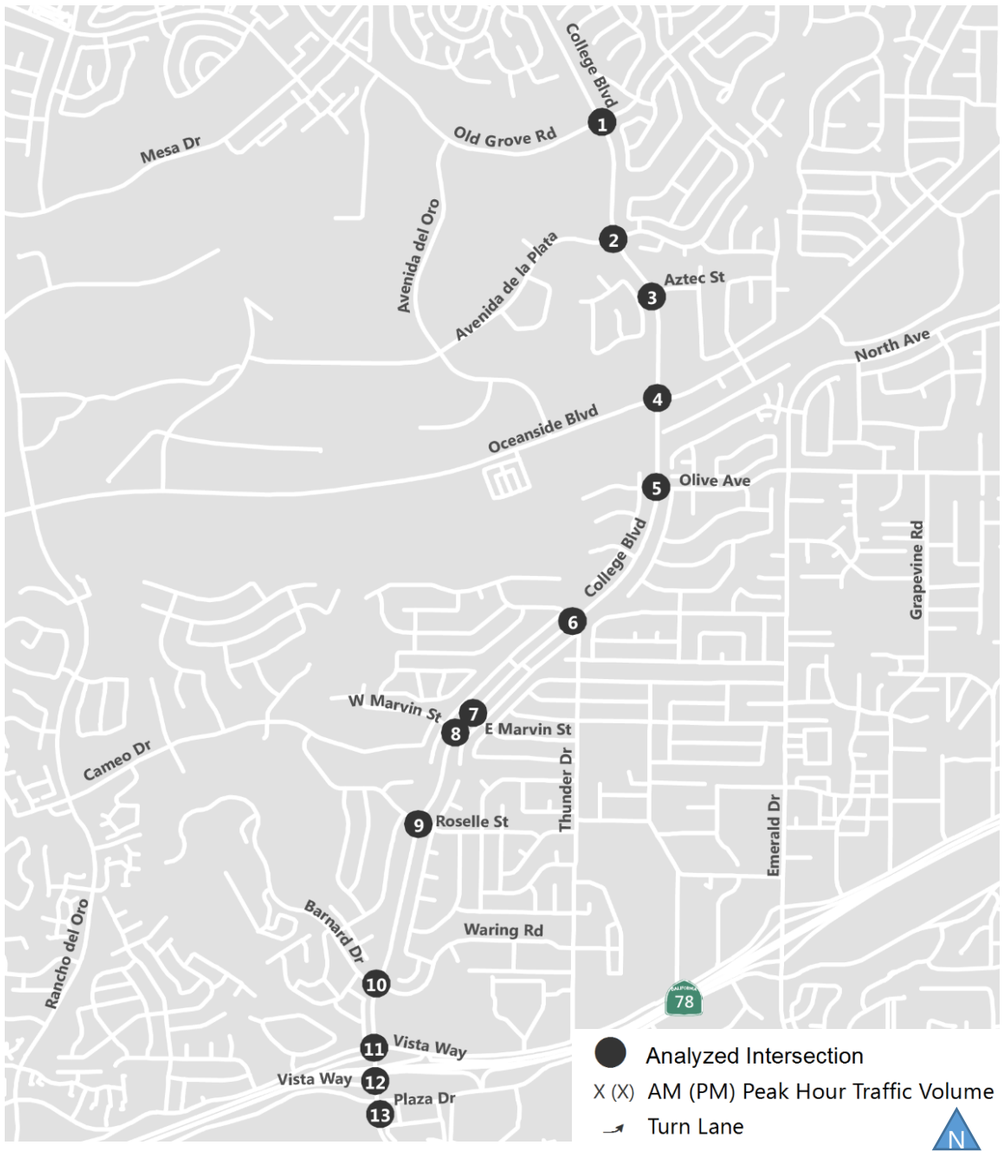


Figure 7

Peak Hour Traffic Volumes and Lane Configurations
Future (2035) Conditions with Existing Geometry/Intersection Configuration



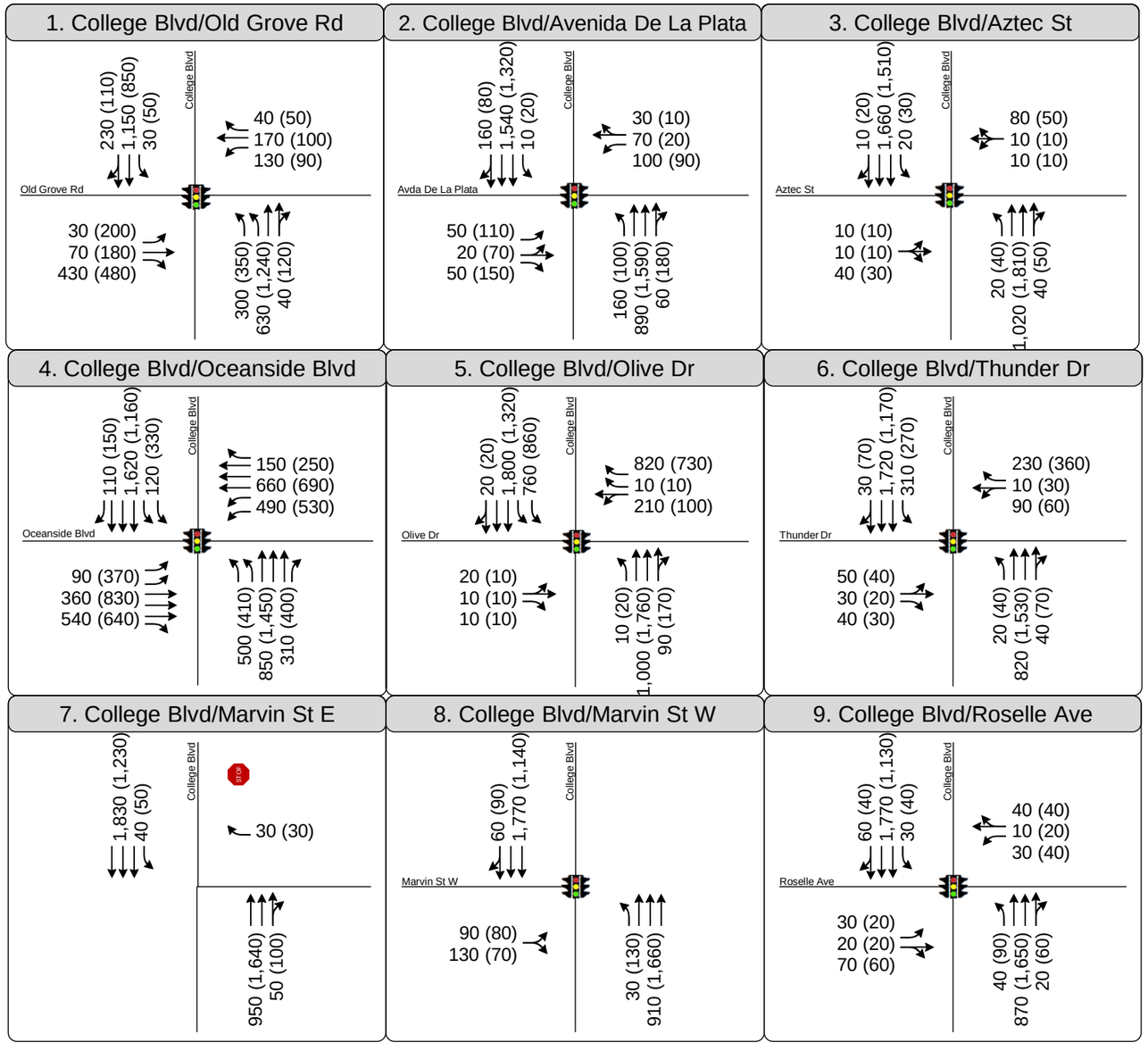


Figure 8

Peak Hour Traffic Volumes and Lane Configurations
Future (2035) Conditions with General Plan Geometry/Intersection Configuration

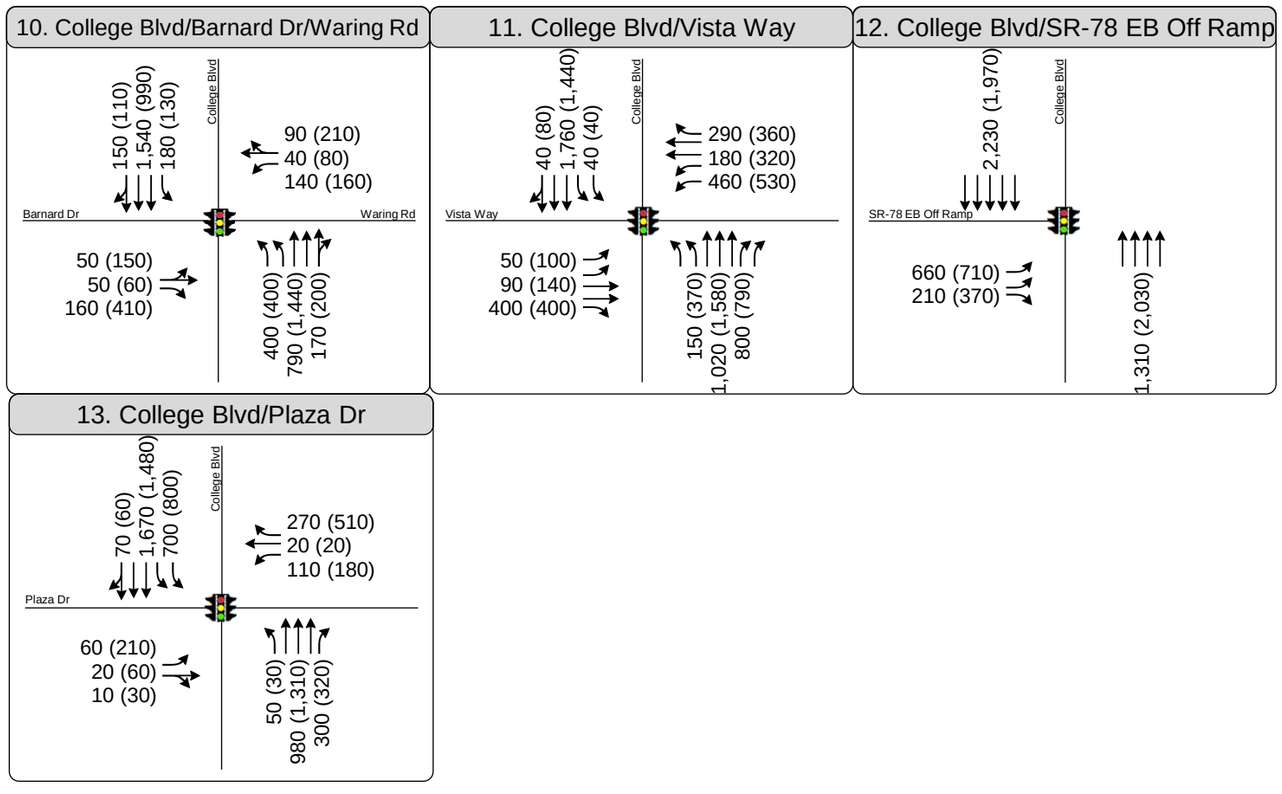


Figure 8

Peak Hour Traffic Volumes and Lane Configurations
Future (2035) Conditions with General Plan Geometry/Intersection Configuration

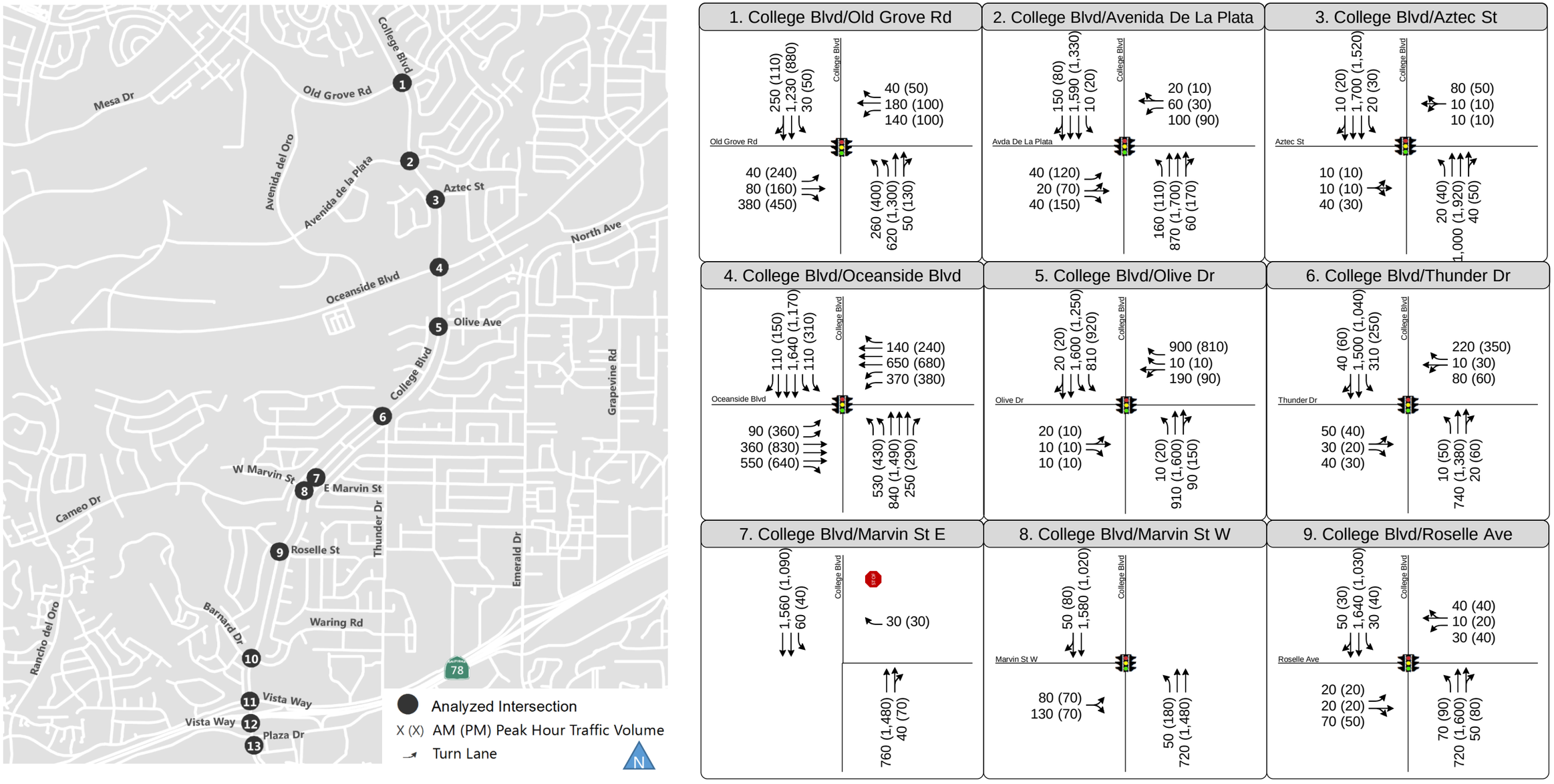


Figure 9

Peak Hour Traffic Volumes and Lane Configurations
Future (2035) Conditions with Recommended Alternative

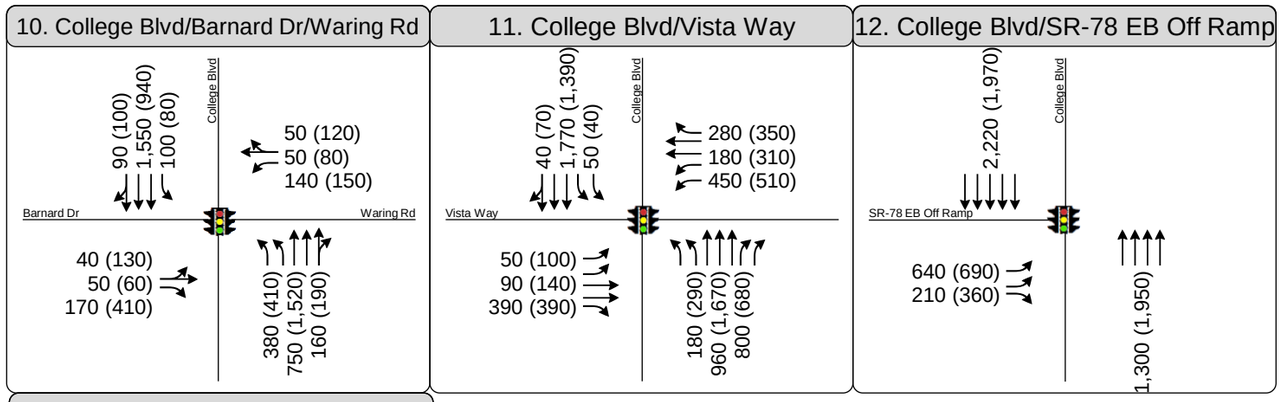


Figure 9

Peak Hour Traffic Volumes and Lane Configurations
Future (2035) Conditions with Recommended Alternative

5.1 GEOMETRY ASSUMPTIONS

The Recommended Alternative maintains four lanes along College Boulevard from Waring Road to Olive Drive while the remainder of the corridor is widened to six lanes per the General Plan *Circulation Element*. The Circulation Element Alternative widens College Boulevard from Waring Road to Old Grove Road from the existing four-lane Major Arterial condition to a six-lane Major Arterial. **Table 9** summarizes the intersection geometry assumptions for intersections along the corridor where geometric conditions are anticipated to change in these two study scenarios (when compared to Existing Conditions).

TABLE 9: FUTURE CONDITIONS INTERSECTION GEOMETRIC CHANGES COMPARED TO EXISTING CONDITIONS

Intersection	Circulation Element Geometric Changes	Recommended Alternative Geometric Changes
1. College Boulevard/ Old Grove Road	No change from Existing Conditions at the intersection in terms of geometry of the approaches. However, the southbound departure is widened to have three receiving lanes.	No change from Existing Conditions at the intersection in terms of geometry of the approaches. However, the southbound departure is widened to have three receiving lanes.
2: College Boulevard/ Avenida De La Plata	Reconfigured intersection due to six-lane Major Arterial widening. • Northbound and southbound approaches will consist of one left-turn lane, two through lanes, and one shared through/right-turn lane. • Eastbound and westbound approaches will remain the same as Existing Conditions.	Same as Circulation Element Alternative.
3. College Boulevard/ Aztec Street	Reconfigured intersection due to six-lane Major Arterial widening. • Northbound and southbound approaches will consist of one left-turn lane, two through lanes, and one shared through/right-turn lane. • Eastbound and westbound approaches are assumed to consist of one shared left/through/right lane. • In addition to the change in lane geometry, the existing side-street stop controlled intersection is assumed to become signalized.	Same as Circulation Element Alternative.

TABLE 9: FUTURE CONDITIONS INTERSECTION GEOMETRIC CHANGES COMPARED TO EXISTING CONDITIONS

Intersection	Circulation Element Geometric Changes	Recommended Alternative Geometric Changes
4. College Boulevard/ Oceanside Boulevard	Reconfigured intersection due to six-lane Major Arterial widening. • Northbound, southbound, and eastbound approaches will consist of two left-turn lanes, three through lanes, and one right-turn lane. • Westbound approach will remain the same as Existing Conditions.	Same as Circulation Element Alternative.
5. College Boulevard/ Olive Drive	Reconfigured intersection due to six-lane Major Arterial widening. • Southbound approach will consist of two left-turn lanes, two through lanes, and one shared through/right-turn lane on the southbound approach • Northbound approach will consist of one left-turn lane, two through lanes, and one shared through/right-turn lane.	No change from Existing Conditions.
6. College Boulevard/ Thunder Drive	Reconfigured intersection due to six-lane Major Arterial widening. • Northbound and southbound approaches will consist of one left-turn lane, two through lanes, and one shared through/right-turn lane. • Eastbound and westbound approaches will remain the same as Existing Conditions.	No change from Existing Conditions.
7. College Boulevard/ Marvin Street East	Reconfigured intersection due to six-lane Major Arterial widening. • Northbound approach will consist of two through lanes and one shared through/right-turn lane. • Southbound approach will consist of one left-turn lane and three through lanes. • Westbound approach will remain the same as Existing Conditions.	No change from Existing Conditions.

TABLE 9: FUTURE CONDITIONS INTERSECTION GEOMETRIC CHANGES COMPARED TO EXISTING CONDITIONS

Intersection	Circulation Element Geometric Changes	Recommended Alternative Geometric Changes
8. College Boulevard/ Marvin Street West	Reconfigured intersection due to six-lane Major Arterial widening. • Southbound approach will consist of two through lanes and one shared through/right-turn lane. • Northbound approach will consist of one left-turn lane and three through lanes. • Eastbound approach will remain the same as Existing Conditions.	No change from Existing Conditions.
9. College Boulevard/ Roselle Avenue	Reconfigured intersection due to six-lane Major Arterial widening. • Northbound and southbound approaches will consist of one left-turn lane, two through lanes, and one shared through/right-turn lane. • Eastbound and westbound approaches will remain the same as Existing Conditions.	No change from Existing Conditions.
10. College Boulevard/ Barnard Drive/ Waring Road	Reconfigured intersection due to six-lane Major Arterial widening. • Northbound approach will consist of two left-turn lanes, two through lanes, and one shared through/right-turn lane. • Southbound approach will consist of one left-turn lane, two through lanes, and one shared through/right-turn lane. • Eastbound and westbound approaches will remain the same as Existing Conditions	Same as Circulation Element Alternative.

TABLE 9: FUTURE CONDITIONS INTERSECTION GEOMETRIC CHANGES COMPARED TO EXISTING CONDITIONS

Intersection	Circulation Element Geometric Changes	Recommended Alternative Geometric Changes
11. College Boulevard/ Vista Way	Reconfigured intersection. • Northbound approach will consist of two left-turn lanes, three through lanes, and two right-turn lanes • Southbound approach will consist of two left-turn lanes, two through lanes, and one shared through/right-turn lane. • Westbound approach will consist of two left-turn lanes, two through lanes, and one right-turn lane. • Eastbound will remain the same as Existing Conditions	Same as Circulation Element Alternative.
12. College Boulevard/ SR-78 Eastbound Off-Ramps	No change from Existing Conditions.	No change from Existing Conditions.
13. College Boulevard/ Plaza Drive	Reconfigured intersection. • Northbound approach will consist of one left-turn lane, three through lanes, and one right-turn. • Southbound, westbound, and eastbound approaches will remain the same as Existing Conditions.	Same as Circulation Element Alternative.

5.2 INTERSECTION OPERATIONS ANALYSIS

Table 10 presents the potential intersection operating conditions across all the study scenarios and compares each scenario's projected levels of service and average vehicular delay at each study intersection with Existing Conditions. The corresponding LOS calculation sheets are included in **Appendix B**.

The results of the intersection operations analysis show that the existing intersection geometry and configuration would not have the capacity to effectively serve the forecasted 2035 peak hour turning movement volumes derived from the traffic model with the Recommended Alternative coded into the network at three (3) intersections in at least one of the peak hours. Both the Future (2035) Condition with General Plan Geometry/Intersection Configuration and the Future (2035) Condition with Recommended Alternative propose lane geometry changes at Intersection 4: College Boulevard/Oceanside Boulevard, Intersection 10: College Boulevard/Barnard Drive/Waring Road, and Intersection 13: College Boulevard/Plaza Drive, which improve their intersection operating conditions to acceptable levels (LOS D or better). Overall, all the study intersections operate at LOS D or better during the AM and PM peak hours with proposed intersection changes under the Circulation Element Alternative or the Recommended Alternative and each respective scenario's forecasted 2035 volumes. From an intersection peak hour operating perspective, these results further support that some locations along College Boulevard do not need to widened per the current *General Plan* in order to serve the increased traffic demand.

Table 11 summarizes the study intersections operating or projected to operate at deficient levels of service (LOS E or LOS F) in either the AM or PM peak hour under at least one of the study scenarios.

TABLE 10: INTERSECTION LEVEL OF SERVICE SUMMARY

Intersection	Traffic Control	Peak Hour	Existing (2018) Conditions		Existing Conditions with Recommended Alternative			Future (2035) Conditions with Existing Geometry (A)			Future (2035) Conditions with General Plan Geometry (B)			Future (2035) Conditions with Recommended Alternative (C)		
			Delay (sec/veh)[1]	LOS[2,3]	Delay (sec/veh)[1]	LOS[2,3]	Delay Change from Existing	Delay (sec/veh)[1]	LOS[2,3]	Delay Change from Existing	Delay (sec/veh)[1]	LOS[2,3]	Delay Change from (B minus A)	Delay (sec/veh)[1]	LOS[2,3]	Delay Change from (C minus B)
1. College Boulevard/Old Grove Road	Signalized	AM	31.9	C	31.3	C	-0.6	35.9	D	4.0	35.4	D	-0.5	36.2	D	0.8
		PM	26.3	C	25.7	C	-0.6	32.0	C	5.7	30.2	C	-1.8	31.1	C	0.9
2. College Boulevard/Avenida De La Plata	Signalized	AM	16.4	B	15.0	B	-1.4	18.9	B	2.5	18.8	B	-0.1	17.7	B	-1.1
		PM	17.6	B	13.8	B	-3.8	15.6	B	-2	14.7	B	-0.9	15.6	B	0.9
3. College Boulevard/Aztec Street	SSSC (Existing) Signal (Future)	AM	15.2	C	5.0	A	-10.2	13.9	B	-1.3	5.3	A	-8.6	5.2	A	-0.1
		PM	25.8	D	4.9	A	-20.9	26.4	D	0.6	5.1	A	-21.3	5.1	A	0.0
4. College Boulevard/ Oceanside Boulevard[4]	Signalized	AM	**64.2**	**E**	45.6	D	-18.6	**85.3**	**F**	**21.1**	53.7	D	-31.6	51.2	D	-2.5
		PM	53.0	D	42.8	D	-10.2	**80.6**	**F**	**27.6**	54.9	D	-25.7	50.3	D	-4.6
5. College Boulevard/Olive Drive	Signalized	AM	25.0	C	24.8	C	-0.2	27.6	C	2.6	24.9	C	-2.7	27.6	C	2.7
		PM	32.1	C	33.3	C	1.2	48.6	D	16.5	31.3	C	-17.3	48.6	D	17.3
6. College Boulevard/Thunder Drive	Signalized	AM	19.1	B	19.6	B	0.5	19.3	B	0.2	18.4	B	-0.9	19.3	B	0.9
		PM	23.7	C	24.2	C	0.5	25.4	C	1.7	22.8	C	-2.6	25.4	C	2.6
7. College Boulevard/East Marvin Street	SSSC	AM	10.4	B	10.3	B	-0.1	11.5	B	1.1	11.0	B	-0.5	10.3	B	-0.7
		PM	14.3	B	14.2	B	-0.1	14.0	B	-0.3	14.8	B	0.8	14.1	B	-0.7
8. College Boulevard/West Marvin Street	Signalized	AM	12.4	B	9.9	A	-2.5	13.1	B	0.7	10.4	B	-2.7	13.6	B	3.2
		PM	8.2	A	8.2	A	0.0	11.3	B	3.1	9.8	A	-1.5	11.4	B	1.6
9. College Boulevard/Roselle Avenue	Signalized	AM	12.0	B	7.5	A	-4.5	7.1	A	-4.9	5.9	A	-1.2	7.3	A	1.4
		PM	11.6	B	8.5	A	-3.1	7.8	A	-3.8	7.1	A	-0.7	8.9	A	1.8
10. College Boulevard/Barnard Drive/Waring Road	Signalized	AM	31.2	C	46.3	D	15.1	**58.7**	**E**	**27.5**	27.1	C	-31.6	23.2	C	-3.9
		PM	30.2	C	20.0	B	-10.2	32.7	C	2.5	30.2	C	-2.5	23.2	C	-7.0

TABLE 10: INTERSECTION LEVEL OF SERVICE SUMMARY

Intersection	Traffic Control	Peak Hour	Existing (2018) Conditions		Existing Conditions with Recommended Alternative			Future (2035) Conditions with Existing Geometry (A)			Future (2035) Conditions with General Plan Geometry (B)			Future (2035) Conditions with Recommended Alternative (C)		
			Delay (sec/veh)[1]	LOS[2,3]	Delay (sec/veh)[1]	LOS[2,3]	Delay Change from Existing	Delay (sec/veh)[1]	LOS[2,3]	Delay Change from Existing	Delay (sec/veh)[1]	LOS[2,3]	Delay Change from (B minus A)	Delay (sec/veh)[1]	LOS[2,3]	Delay Change from (C minus B)
11. College Boulevard/Vista Way	Signalized	AM	38.3	D	39.7	D	1.4	26.4	C	-11.9	20.9	C	-5.5	27.2	C	6.3
		PM	**74.6**	**E**	35.2	D	-39.4	35.5	D	-39.1	31.6	C	-3.9	32.3	C	0.7
12. College Boulevard/SR-78 Eastbound Off-Ramps	Signalized	AM	13.7	B	12.7	B	-1.0	11.9	B	-1.8	12.1	B	0.2	11.7	B	-0.4
		PM	14.1	B	14.4	B	0.3	12.5	B	-1.6	14.6	B	2.1	14.0	B	-0.6
13. College Boulevard/Haymar Drive/Plaza Drive	Signalized	AM	20.3	C	22.3	C	2.0	23.4	C	3.1	21.3	C	-2.1	22.1	C	0.8
		PM	41.2	D	32.7	C	-8.5	**84.5**	**F**	**43.3**	53.2	D	-31.3	50.3	D	-2.9

Source: Fehr & Peers, 2016 and 2018.
Notes:
SSSC = Side street stop-controlled intersection
1 Whole intersection weighted average stopped delay expressed in seconds per vehicle for signalized and all-way stop control intersections. The vehicular delay for the worst movement is reported for side street stop-controlled intersections.
2 LOS calculations performed using the 2000 Highway Capacity Manual (HCM) method.
3 Unacceptable seconds of delay per vehicle and LOS highlighted in **bold**.
4 The planned improvement at the intersection for a third westbound through lane on Oceanside Boulevard was assumed under Existing with Rec. Alt., 2035 with General Plan, and 2035 with Rec. Alt. Conditions.

TABLE 11: SUMMARY OF DEFICIENT INTERSECTION OPERATIONS

Intersection	College Boulevard Corridor Condition				
	Existing	Existing w/ Recommended Alternative	Future w/ Existing Configuration	Future w/ General Plan Configuration	Future w/ Recommended Alternative
4. College Boulevard/ Oceanside Boulevard	X		X		
10. College Boulevard/Barnard Drive/Waring Road			X		
11. College Boulevard/ Vista Way	X				
13. College Boulevard/ Plaza Drive			X		

Source: Fehr & Peers, 2016 and 2018

5.2.1 POTENTIAL INTERSECTION IMPACTS – RECOMMENDED ALTERNATIVE

As indicated in both **Table 10 and Table 11**, the Future (2035) with Recommended Alternative would not cause peak hour intersection level of service operations to degrade to deficient levels (LOS E or LOS F). Since the improvements proposed under the Recommended Alternative are able to accommodate future traffic demand at the study intersections, no mitigation measures are proposed.

5.2.2 LEFT-TURN QUEUING ASSESSMENT – RECOMMENDED ALTERNATIVE

The following study intersections that were also analyzed to determine if excessive queueing under the Future (2035) with Recommended Alternative may occur. Queues were generated using the Synchro 8 analysis software:

1. College Boulevard/Old Grove Road
2. College Boulevard/Avenida De La Plata
3. College Boulevard/Aztec Street
4. College Boulevard/Oceanside Boulevard
5. College Boulevard/Olive Drive

The purpose of this evaluation is to determine the frequencies of left-turn traffic spilling back into the through traffic lanes thereby reducing through capacity along College Boulevard during the peak hours. As shown in **Table 12** and the Synchro queue reports provided in **Appendix D**, potential queuing issues have been identified at:

- NBL on College Boulevard/Oceanside Boulevard during the AM peak hour
- SBL on College Boulevard/Olive Drive during the PM peak hour

The above queuing issues are based on a review of the 95th percentile queues. The 95th percentile queues represent the worst-case condition that in many cases will not be experienced due to upstream metering. A review of also the 50th percentile queues, which reflect more typical cycle conditions, showed that there will be no regularly occurring left-turn queuing issues at College Boulevard/Oceanside Boulevard. At College Boulevard/Olive Drive, the Future Year 2035 PM peak hour volume on the southbound approach will exceed the capacity, and so the southbound left turn may experience queues that are longer than reported under the 50th percentile analysis.

TABLE 12: QUEUING ANALYSIS (2035 WITH RECOMMENDED ALTERNATIVE)

Intersection	Left-Turn Direction	Double Left	Available Storage (ft)[1]	AM Peak Hour		PM Peak Hour	
				50th %ile (ft)	95th %ile (ft)	50th %ile (ft)	95th %ile (ft)
1. College Boulevard/Old Grove Road	NB	Yes	350	96	142	160	208
	SB	No	310	21	53	42	100
2. College Boulevard/Avenida De La Plata	NB	No	360	114	230	101	166
	SB	No	200	0	*0	18	*25
3. College Boulevard/Aztec Street	NB	No	180	14	40	37	*39
	SB	No	200	13	*20	25	*50
4. College Boulevard/Oceanside Boulevard	NB	Yes	320	260	#398	181	241
	SB	Yes	420	54	96	128	224
5. College Boulevard/Olive Drive	NB	No	190	7	26	16	45
	SB	Yes	450	268	364	~485	#615

Source: Fehr & Peers, 2016
Notes:

~ = 50th percentile volume exceeds capacity, queue may be longer

= 95th percentile volume exceeds capacity, queue may be longer

* = Volume for 95th percentile queue is metered by upstream signal

[1] Approximate length based on the approved plans for the Recommended Alternative.

One of the key operational issues along the corridor is the impact of the Sprinter gates located between Oceanside Boulevard and Olive Drive. Queuing both northbound and southbound along this segment of the corridor exists today and will continue to exist under the Recommended Alternative based on the results of the queueing assessment. It is also projected that there will be a heavy southbound left turn movement during the peak periods at the Oceanside Boulevard and Olive Drive intersection that continue to exceed the left turn pocket. The location of the crossing gates restrict the ability to further extend the pocket. However, the restriping of the southbound approach provides for a "trap" outside left turn lane that extends the queue capacity by 550 feet more than the existing condition. Converting the lane to a "trap" lane reduces through lane blockage that currently occurs on the southbound approach.

Overall, it should be noted that the potential issues at College Boulevard/Oceanside Boulevard and College Boulevard/Olive Drive occur along a physically-constrained segment so there would not be opportunity to lengthen the storage lengths. Although a queuing issue would still occur under the 50th percentile at the southbound left-turn on College Boulevard/Olive Drive, the outside left-turn which is a trapped lane will be able to provide excess capacity and could hold vehicles queuing up. As shown in Table 13, the average daily traffic volumes on College Boulevard between Oceanside Boulevard and Olive Drive are estimated to be 1,800 less under the "2035 with Recommended Alternative" than under the "2035 with General Plan Buildout" condition. Therefore, the queue lengths reported at this location maybe worse than what could potentially occur. Signal optimization is also recommended at College Boulevard/Oceanside Boulevard and College Boulevard/Olive Drive to reduce or manage queues.

5.3 ROADWAY SEGMENT OPERATIONAL ANALYSIS

To evaluate the roadway segment operating conditions along College Boulevard, the study roadway segments were evaluated for both daily and peak hour segment operations for all study scenarios. Peak hour segments were evaluated using the HCM Arterial Analysis methodology for AM and PM peak hour conditions and the daily conditions using the volume-to-capacity methodology.

5.3.1 DAILY ROADWAY SEGMENT OPERATIONS

Table 13 presents the results of the daily roadway segment LOS analysis for each scenario, while **Figures 10 and 11** illustrate the Future (2035) daily roadway volumes used.

Table 14 summarizes the study roadway segments operating at deficient levels of service (LOS E or LOS F) under at least one of the scenarios based on the daily roadway segment operations analysis conducted.

The results of the daily roadway segment analysis show that the future ambient growth and the widening of College Boulevard to a six-lane Major Arterial would result in an increase in traffic volumes along the corridor ranging from 2,600 to 14,700 vehicles per day when compared to Existing Conditions. Also when compared to Existing Conditions, the ADT forecasted under the Recommended Alternative would result in an increase in traffic flow along the corridor ranging from 3,600 to 12,900 vehicles per day.

Comparing the Existing and Existing with Recommended Alternative scenarios, the daily roadway segment analysis indicates improved operations at the following segments as a result of the increase in roadway capacity for four to six lanes:

- Old Grove Road to Avenida de la Plata (LOS E to LOS C)
- Avenida De La Plata to Oceanside Boulevard (LOS E to LOS C)
- Oceanside Boulevard to Olive Drive (LOS F to LOS E)

Comparison the Future (2035) General Plan and Future (2035) with Recommended Alternative scenarios, the daily roadway analysis forecasts worsened operations at the following segments as a result in the decrease in roadway capacity from six to four lanes:

- Olive Drive to Thunder Drive (LOS D to LOS E)
- Thunder Drive to Marvin Street (LOS C to LOS D)
- Marvin Street to Barnard Drive/Waring Road (LOS D to LOS E)

Both future scenarios demonstrate that the additional capacity provided with any widening alternative along the corridor would not be enough to offset the increase in daily traffic flow along the College Boulevard corridor for the roadway segments between Avenida De La Plata and Olive Drive and between Barnard Drive/Waring Road and Vista Way, since their resulting daily roadway segment LOS is E or F with V/C ratios greater than 0.9. Additionally, the segment between Olive Drive and Thunder Drive and the segment between Marvin Street and Waring Road would each operate at a deficient LOS E under the Future (2035) with Recommended Alternative.

TABLE 13: DAILY ROADWAY SEGMENT LEVEL OF SERVICE SUMMARY

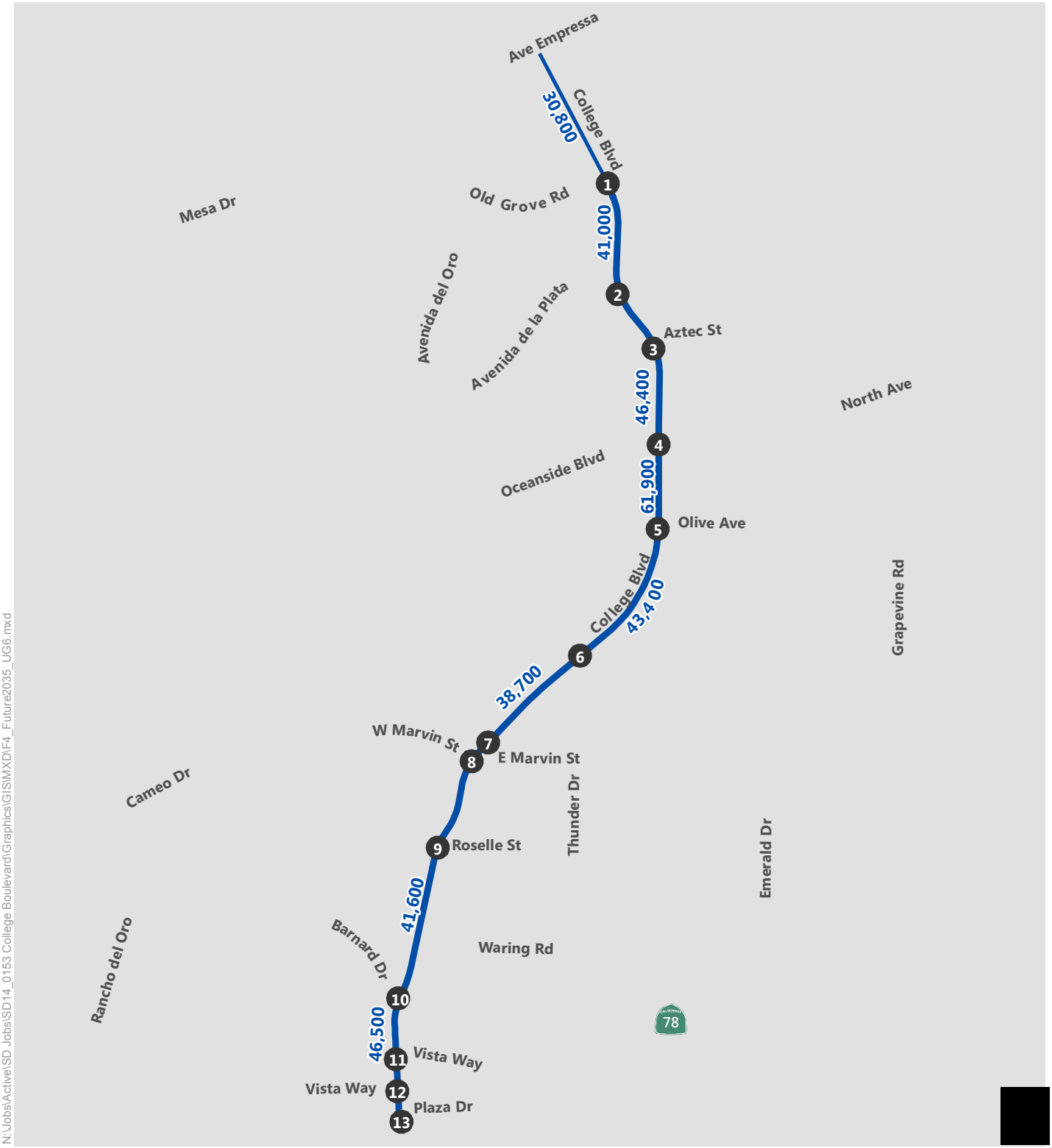
Roadway Segment	Existing Cross-Section	Existing LOS E Capacity	Future Cross-Section (Circulation Element)	Future LOS E Capacity	Existing (2018) Conditions			Existing Conditions with Recommended Alternative				Future (2035) Conditions with Existing Geometry (A)				Future (2035) Conditions with General Plan Geometry (B)				Future (2035) Conditions with Recommended Alternative			
					ADT	V/C	LOS	ADT	V/C	LOS	V/C Change from Existing	ADT	V/C	LOS	V/C Change from Existing	ADT	V/C	LOS	V/C Change from (A)	ADT	V/C	LOS	V/C Change from (B)
1. College Blvd b/w Avenida Empressa & Old Grove Rd	4-Lane Major Arterial w/ raised median	40,000	4-Lane Major Arterial w/ raised median	40,000	29,875	0.747	C	29,875	0.747	C	0.000	32,200	0.805	D	0.058	30,800	0.770	D	-0.035	32,200	0.805	D	0.035
2. College Blvd b/w Old Grove Rd & Avenida De La Plata	4-Lane Major Arterial w/ raised median	40,000	6-Lane Major Arterial, Divided	50,000	**38,215**	**0.955**	**E**	38,215	0.764	C	-0.191	**41,100**	**1.028**	**F**	0.072	41,000	0.820	D	-0.208	41,100	0.822	D	0.002
3. College Blvd b/w Avenida de la Plata & Oceanside Blvd	4-Lane Major Arterial w/ raised median	40,000	6-Lane Major Arterial, Divided	50,000	**36,971**	**0.924**	**E**	36,971	0.739	C	-0.185	**46,400**	**1.160**	**F**	**0.236**	**46,400**	**0.928**	**E**	-0.232	**46,400**	**0.928**	**E**	0.000
4. College Blvd b/w Oceanside Blvd & Olive Dr	4-Lane Major Arterial w/ raised median	40,000	6-Lane Major Arterial, Divided	50,000	**49,943**	**1.249**	**F**	**49,943**	**0.999**	**E**	-0.250	**60,100**	**1.503**	**F**	**0.254**	**61,900**	**1.238**	**F**	-0.265	**60,100**	**1.202**	**F**	-0.036
5. College Blvd b/w Olive Dr & Thunder Dr[2]	4-Lane Major Arterial w/ raised median	40,000	6-Lane Major Arterial, Divided[2]	50,000	**35,917**	**0.898**	**E**	**35,917**	**0.898**	**E**	0.000	**39,400**	**0.985**	**E**	**0.087**	43,400	0.868	D	-0.117	**39,400**	**0.985[2]**	**E**	**0.117**
6. College Blvd b/w Thunder Dr & Marvin St East[2]	4-Lane Major Arterial w/ raised median	40,000	6-Lane Major Arterial, Divided[2]	50,000	31,746	0.794	D	31,746	0.794	D	0.000	34,500	0.863	D	0.069	38,700	0.774	C	-0.089	34,500	0.863[2]	D	0.089
7. College Blvd b/w Marvin St & Barnard Dr/Waring Rd[2]	4-Lane Major Arterial w/ raised median	40,000	6-Lane Major Arterial, Divided[2]	50,000	32,778	0.819	D	32,778	0.819	D	0.000	**35,200**	**0.880**	**E**	**0.061**	41,600	0.832	D	-0.048	**35,200**	**0.880[2]**	**E**	**0.048**
8. College Blvd b/w Barnard Dr/Waring Rd & Vista Way	6-Lane Major Arterial, Divided	50,000	6-Lane Major Arterial, Divided	50,000	44,216	0.884	D	44,216	0.884	D	0.000	**45,100**	**0.902**	**E**	**0.018**	**46,500**	**0.930**	**E**	0.028	**45,100**	**0.902**	**E**	-0.028

Source: Fehr & Peers, 2016 and 2018.
Notes:
1 Deficient roadway segment operations highlighted in bold.
2 Under the Recommended Alternative, the 4-Lane Major Arterial cross-section for the segment remains. Therefore, the V/C ratio and future roadway LOS is based on the City's LOS standard and capacity criteria for a 4-Lane Major Arterial roadway.

TABLE 14: SUMMARY OF DEFICIENT DAILY ROADWAY SEGMENT OPERATIONS

Roadway Segment	College Boulevard Corridor Condition ("X" Indicates Deficient Daily Roadway Segment Operations)				
	Existing	Existing w/ Recommended Alternative	Future w/ Existing Configuration	Future w/ General Plan Configuration	Future w/ Recommended Alternative
2. College Boulevard between Old Grove Road & Avenida De La Plata	X		X		
3. College Boulevard between Avenida De La Plata & Oceanside Boulevard	X		X	X	X
4. College Boulevard between Oceanside Boulevard & Olive Drive	X	X	X	X	X
5. College Boulevard between Olive Drive & Thunder Drive	X	X	X		X
7. College Boulevard between Marvin Street & Barnard Drive/Waring Road			X		X
8. College Boulevard between Barnard Drive/Waring Road & Vista Way			X	X	X

Source: Fehr & Peers, 2016 and 2018



[redacted]

Study Intersections

4-Lane Major Arterial with Raised Median

6-Lane Major Arterial, Divided

[redacted]

Figure 10

Future (2035) Average Daily Traffic (ADT) Volumes
Circulation Element Alternative

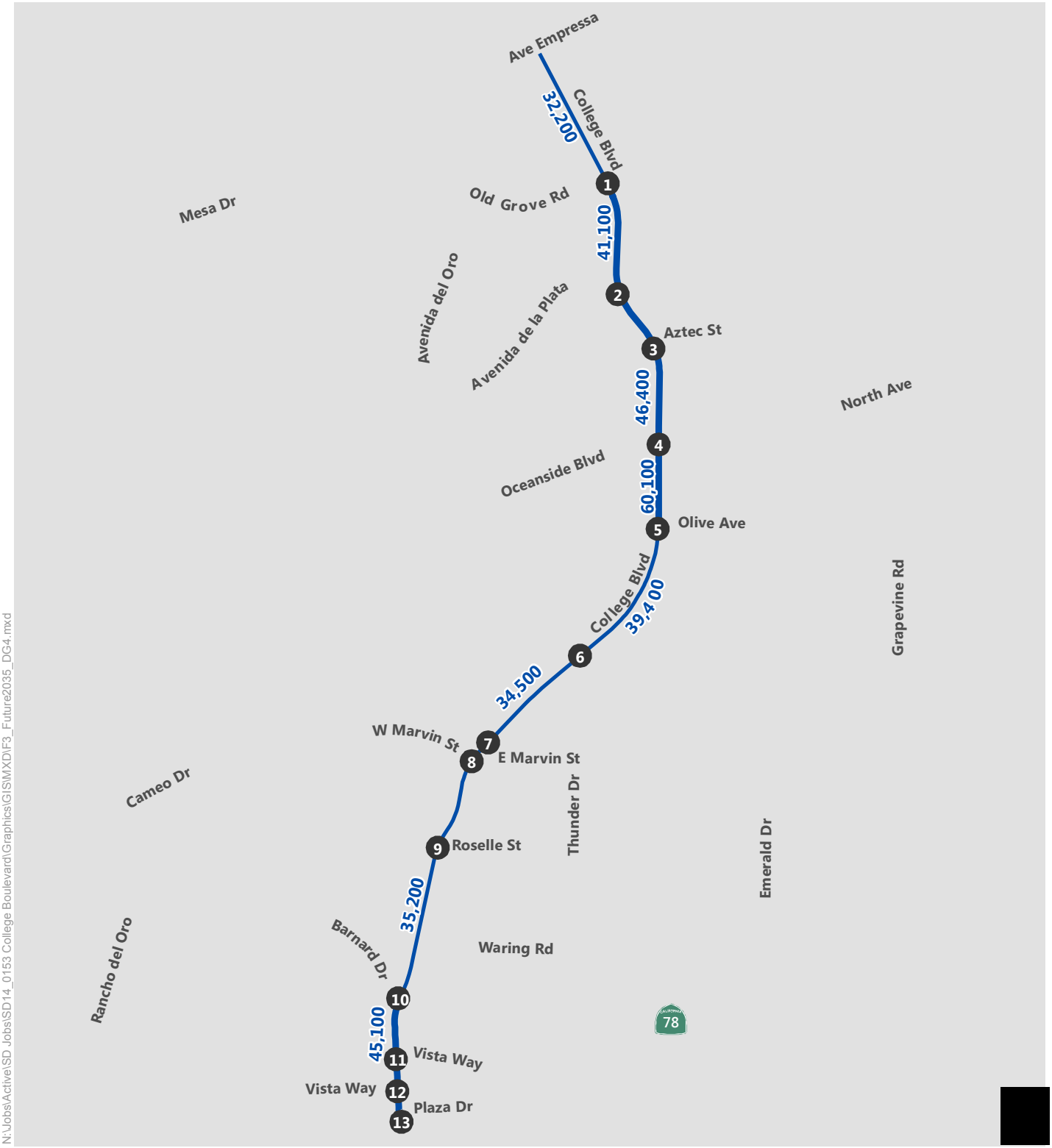


Figure 11

Future (2035) Average Daily Traffic (ADT) Volumes Recommended Alternative

5.3.2 PEAK HOUR ROADWAY SEGMENT OPERATIONS

Peak hour roadway segment analysis was also conducted for the corridor study area under each condition to further understand the operational characteristics along the corridor during peak conditions. The peak hour roadway analysis was conducted using the HCM Arterial Analysis methodology and helps better gauge the operational benefits associated with intersection improvements and spot widening along the corridor that cannot be reflected in the daily segment analysis, which assesses volume-over-capacity ratios. The peak hour analysis offers an additional method for evaluating the operations of a roadway segment. Significant impacts on the roadway segments were identified if they operate unacceptably for both the daily segment analysis and the peak hour analysis. The corresponding peak hour roadway segment LOS worksheets are provided in **Attachment E**.

Table 15 presents results of the peak hour segment analysis for each scenario. The proposed improvements along College Boulevard under the Recommended Alternative or Circulation Element Alternative provide an increase in capacity however, the increased traffic demand under 2035 conditions will result in deficient peak hour roadway operating conditions along portions of the corridor. For example, segments to the north and south of Oceanside Boulevard are forecasted to operate at LOS E or F in at least one of the peak hours. Deficient operations along these segments are due to the combination of increased traffic demand and the disruption in traffic caused by the at-grade crossing just south of the College Boulevard/Oceanside Boulevard intersection. Segments surrounding the SR-78 interchange at College Boulevard (i.e. from Waring Road to Plaza Drive) are also forecast to operate at LOS E or F in at least one of the peak hours. These conditions are due to the increased traffic demand related to accessing to/from the regional facility as well as the close spacing between successive signalized intersections. Although these portions of the roadway segments along the study corridor are forecast to operate at deficient LOS in the AM and/or PM peak hour, all segments between Waring Road and Olive Drive are forecast to operate at LOS D or better in both the northbound and southbound directions under the Recommended Alternative and the Circulation Element Alternative. Although the daily segment analysis suggests LOS D and LOS E operating conditions based on the V/C ratio, the peak hour roadway operating conditions support that the section between Waring Road and Olive Drive can remain a four-lane Major Arterial and still serve 2035 peak hour roadway volumes at acceptable operating conditions. Project impacts are less than significant based on the peak hour roadway segment analysis.

Table 16 summarizes the roadway segments found to operate at deficient levels of service (LOS E or LOS F) during one or more peak hours in at least one direction of travel based on the peak hour roadway segment operations analysis conducted.

TABLE 15: PEAK HOUR SEGMENT ANALYSIS SUMMARY

Roadway Segment	Direction	Existing (2018) Conditions				Existing (2018) Conditions with Recommended Alternative				Δ Existing vs Existing with Rec. Alt.		Future (2035) Conditions with Existing Geometry/Intersection Configuration				Future (2035) Conditions with General Plan Geometry/Intersection Configuration				Future (2035) Conditions with Recommended Alternative				Δ Future vs Future with Rec. Alt.	
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM	PM	AM		PM		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM	PM
		Speed (mph)	LOS[1]	Speed (mph)	LOS[1]	Speed (mph)	LOS[1]	Speed (mph)	LOS[1]			Speed (mph)	LOS[1]	Speed (mph)	LOS[1]	Speed (mph)	LOS[1]	Speed (mph)	LOS[1]	Speed (mph)	LOS[1]	Speed (mph)	LOS[1]		
College Boulevard between Old Grove Road and Avenida De La Plata	NB	29.7	B	27.7	C	20.3	D	28.5	B	-9.4	0.8	26.7	C	26.1	C	28.1	B	28.9	B	26.2	C	27.5	C	-1.9	-1.4
	SB	24.9	C	26.6	C	28.8	B	25.8	C	3.9	-0.8	26.9	C	25.0	C	24.1	C	24.1	C	24.5	C	23.4	C	0.4	-0.7
College Boulevard between Avenida De La Plata and Aztec Street	NB	29.7	B	31.4	B	25.5	C	29.0	B	-4.2	-2.4	33.1	B	36.1	A	27.2	C	29.4	B	27.3	C	28.3	B	0.1	-1.1
	SB	**16.5**	**E**	18.4	D	32.1	B	30.1	B	15.6	11.7	**10.8**	**F**	17.8	D	31.4	B	30.9	B	31.4	B	29.8	B	0	-1.1
College Boulevard between Aztec Street and Oceanside Boulevard	NB	29.7	B	31.4	B	28.1	B	29.5	B	-1.6	-1.9	33.1	B	36.1	A	27.8	C	30.2	B	27.8	C	30.4	B	0	0.2
	SB	**16.5**	**E**	18.4	D	**12.6**	**F**	**16.6**	**E**	-3.9	-1.8	**10.8**	**F**	17.8	D	**12**	**F**	**14.2**	**E**	**12.6**	**F**	**14.2**	**E**	0.6	0
College Boulevard between Oceanside Boulevard and At-Grade Crossing	NB	**3.8**	**F**	**3.6**	**F**	**6.7**	**F**	**4.5**	**F**	2.9	0.9	**6.6**	**F**	**2.1**	**F**	**6.9**	**F**	**3.4**	**F**	**7.7**	**F**	**4.0**	**F**	0.8	0.6
	SB	**8.3**	**F**	**9.2**	**F**	**11.1**	**F**	**11.6**	**F**	2.8	2.4	**5.6**	**F**	**7.4**	**F**	**9.4**	**F**	**9.9**	**F**	**9.7**	**F**	**10.3**	**F**	0.3	0.4
College Boulevard between At-Grade Crossing and Olive Drive	NB	18.8	D	**16.3**	**E**	20.5	D	19.5	D	1.7	3.2	**16.8**	**E**	**12.7**	**F**	19.4	D	17.3	D	19.4	D	17.6	D	0	0.3
	SB	21.5	D	24.6	C	21.1	D	24.4	C	-0.4	-0.2	19.4	D	22.6	C	20.1	D	23.0	C	19.4	D	22.6	C	-0.7	-0.4
College Boulevard between Olive Drive and Thunder Drive[2]	NB	20.0	D	21.6	D	20.8	D[2]	21.5	D[2]	0.8	-0.1	19.4	D	17.1	D	20.4	D[2]	20.4	D[2]	19.4	D	17.1	D	-1	-3.3
	SB	33.2	B	31.9	B	33.6	B[2]	32.3	B[2]	0.4	0.4	31.9	B	31.1	B	30.6	B[2]	31.6	B[2]	31.9	B	31.1	B	1.3	-0.5
College Boulevard between Thunder Drive and Marvin Street West[2]	NB	25.1	C	25.0	C	25.1	C[2]	24.6	C[2]	0	-0.4	25.8	C	24.4	C	25.4	C[2]	24.8	C[2]	25.8	C	24.4	C	0.4	-0.4
	SB	30.4	B	29.8	B	30.7	B[2]	28.4	B[2]	0.3	-1.4	27.6	C	25.5	C	29	B[2]	26.6	C[2]	27.6	C	25.5	C	-1.4	-1.1
College Boulevard between Marvin Street West and Roselle Avenue[2]	NB	23.7	C	32.6	B	32.2	B[2]	32.0	B[2]	8.5	-0.6	31.9	B	33.2	B	32.1	B[2]	33.2	B[2]	30.2	B	33.0	B	-1.9	-0.2
	SB	21.5	D	23.5	C	28.5	B[2]	32.0	B[2]	7	8.5	29.0	B	32.7	B	29.4	B[2]	32.3	B[2]	28.7	B	32.8	B	-0.7	0.5
College Boulevard between Roselle Avenue and Waring Road[2]	NB	38.3	A	32.0	B	39.5	A[2]	34.2	B[2]	1.2	2.2	40.7	A	35.3	A	39.9	A	35.4	A	39.6	A	33.6	B	-0.3	-1.8
	SB	21.1	D	20.5	D	27.1	C[2]	27.4	C[2]	6	6.9	**13.3**	**E**	27.6	C	24.8	C	26.7	C	25.9	C	28.6	B	1.1	1.9

TABLE 15: PEAK HOUR SEGMENT ANALYSIS SUMMARY

Roadway Segment	Direction	Existing (2018) Conditions				Existing (2018) Conditions with Recommended Alternative				Δ Existing vs Existing with Rec. Alt.		Future (2035) Conditions with Existing Geometry/Intersection Configuration				Future (2035) Conditions with General Plan Geometry/Intersection Configuration				Future (2035) Conditions with Recommended Alternative				Δ Future vs Future with Rec. Alt.	
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM	PM	AM		PM		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM	PM
		Speed (mph)	LOS[1]	Speed (mph)	LOS[1]	Speed (mph)	LOS[1]	Speed (mph)	LOS[1]			Speed (mph)	LOS[1]	Speed (mph)	LOS[1]	Speed (mph)	LOS[1]	Speed (mph)	LOS[1]	Speed (mph)	LOS[1]	Speed (mph)	LOS[1]		
College Boulevard between Waring Road and Vista Way	NB	18.1	D	**14.8**	**E**	19.7	D	19.4	D	1.6	4.6	18	D	**12.7**	**F**	18.1	D	**14.4**	**E**	20.7	D	19.0	D	2.6	4.6
	SB	**11.6**	**F**	**4.7**	**F**	**14.9**	**E**	**11.9**	**F**	3.3	7.2	17.1	D	**11.5**	**F**	19.2	D	**13.5**	**E**	17.3	D	**12.7**	**F**	-1.9	-0.8
College Boulevard between Vista Way and SR-78 Eastbound Off-Ramps	NB	17.8	D	17.0	D	**11.2**	**F**	**8.9**	**F**	-6.6	-8.1	**13.5**	**E**	**10.7**	**F**	**16.9**	**E**	**10.3**	**F**	**12.3**	**F**	**9.5**	**F**	-4.6	-0.8
	SB	18.9	D	**16.1**	**E**	20.4	D	19.6	D	1.5	3.5	20.6	D	23.3	C	21.7	D	**17.0**	**E**	20.8	D	18.2	D	-0.9	1.2
College Boulevard between SR-78 Eastbound Off-Ramp and Plaza Drive	NB	**16.6**	**E**	17.6	D	18.8	D	**11.9**	**F**	2.2	-5.7	**16.9**	**E**	**13.8**	**E**	**13.7**	**E**	**14.4**	**E**	17.7	D	**14.6**	**E**	4	0.2
	SB	**14.5**	**E**	**10.5**	**F**	**13.8**	**E**	**10.8**	**F**	-0.7	0.3	17.9	D	**7.6**	**F**	**12.2**	**F**	**9.9**	**F**	**14.7**	**E**	**10.2**	**F**	2.5	0.3

Source: Fehr & Peers, 2016 and 2018.
Notes:
1 Deficient roadway segment operations highlighted in **bold**.
2 Under the Recommended Alternative, the 4-Lane Major Arterial cross-section for the segment remains.
Some Peak Hour analysis segments differ from the Daily Roadway ADT segments. The peak hour and daily roadway segments were determined during project scoping in 2014 with City staff.

TABLE 16: SUMMARY OF DEFICIENT PEAK HOUR ROADWAY SEGMENT OPERATIONS

Segment	College Boulevard Corridor Condition ("X" Indicates Deficient Daily Roadway Segment Operations)				
	Existing	Existing w/ Recommended Alternative	Future w/ Existing Configuration	Future w/ General Plan Configuration	Future w/ Recommended Alternative
Between Avenida De La Plata and Oceanside	X		X		
Between Aztec Street and Oceanside Boulevard	X	X		X	X
Between Oceanside Boulevard and At-Grade Crossing	X	X	X	X	X
Between At-Grade Crossing and Olive Drive	X		X		
Between Roselle Avenue and Waring Road			X		
Between Waring Road and Vista Way	X	X	X	X	X
Between Vista Way and SR-78 Eastbound Off-Ramps	X	X	X	X	X
Between SR-78 Eastbound Off-Ramp and Plaza Drive	X	X	X	X	X

Source: Fehr & Peers, 2016 and 2018

5.3.3 POTENTIAL ROADWAY SEGMENT IMPACTS – RECOMMENDED ALTERNATIVE

5.3.3.1 Segment #3: College Boulevard from Avenida De La Plata to Oceanside Boulevard

As shown in **Table 13**, College Boulevard from Avenida De La Plata to Oceanside Boulevard is forecast to operate at deficient LOS E based on the daily segment (V/C) methodology even with the proposed widening to six lanes included in the Recommended Alternative. The peak hour roadway segment analysis results presented in **Table 15** also show projected failing operations in the southbound direction along this segment in both the AM and PM peak hours. The implementation of a traffic signal at College Boulevard and Aztec Street affects the peak hour roadway segment performance because it slows vehicles traversing through the section; however, this signal provides better control and benefit to operations at Intersection 3: College Boulevard/Aztec Street, which is projected to operate at LOS A during both the AM and PM peak hour. **Table 10** also shows acceptable peak hour intersection operations at Intersection 4: College Boulevard/Oceanside Boulevard.

Overall, the combination of increased traffic volumes and implementation of a signal at Aztec Street causes deficient daily and peak hour roadway segment operations along College Boulevard from Avenida De La Plata to Oceanside Boulevard under the Recommended Alternative. There is no feasible physical mitigation at this segment that would improve daily roadway segment LOS due to right-of-way constraints. Additionally, not implementing a traffic signal at Intersection 4: College Boulevard/Aztec Street would only partially mitigate the peak hour roadway segment operations along this segment, as **Table 16** continues to show LOS F peak hour operations at this location in the southbound direction under the Future (2035) Conditions with Existing Geometry/Intersection Configuration. It should be noted that significant and unavoidable impacts at the College Boulevard segment between Avenida De La Plata and Oceanside Boulevard were already identified in the latest *Oceanside General Plan: Circulation Element* (2012), which includes a statement of overriding consideration for this segment. Therefore, the project does not result in any new impact not already identified in the General Plan, and no mitigations are proposed.

5.3.3.2 Segment #4: College Boulevard from Oceanside Boulevard to Olive Drive

As shown in **Table 13**, College Boulevard from Oceanside Boulevard to Olive Drive is forecast to remain operating at deficient LOS F based on the daily segment (V/C) methodology even with the proposed widening to six lanes included in the Recommended Alternative. The peak hour roadway segment analysis results presented in **Table 15** also show failing operations in both the northbound and southbound direction along the portion of the segment north of the at-grade crossing in both the AM and PM peak hours. Despite the deficient daily and peak hour roadway segment operations caused by the combination of increased traffic volumes and the interface with the at-grade railroad crossing located mid-block, **Table**

10 shows acceptable peak hour intersection operations at Intersection 4: College Boulevard/Oceanside Boulevard and Intersection 5: College Boulevard/Olive Drive.

Based on the results of the roadway segment operational analysis, the Recommended Alternative could potentially cause significant impacts at the College Boulevard segment from Oceanside Boulevard to Olive Drive Boulevard. However, there is no feasible physical mitigation at this segment that would improve daily and peak hour roadway segment LOS due to right-of-way constraints. It should also be noted that significant and unavoidable impacts at the College Boulevard segment between Oceanside Boulevard and Olive Drive were already identified in the latest *Oceanside General Plan: Circulation Element* (2012), which includes a statement of overriding consideration for this segment. Therefore, the project does not result in any new impact not already identified in the General Plan, and no mitigations are proposed.

5.3.3.3 Segment #8: College Boulevard from Waring Road to Vista Way

As shown in **Table 13**, the roadway segment between Waring Road and Vista Way is forecast to operate at LOS E based on the daily segment (V/C) methodology. The peak hour roadway segment analysis results presented in **Table 15** also show LOS F operations in the southbound direction during the PM peak hour. Despite the deficient daily and peak hour roadway segment operations caused by the increased traffic demand related to accessing to/from the SR-78 interchange at College Boulevard, **Table 10** shows acceptable peak hour intersection operations at Intersection 10: College Boulevard/Barnard Drive/Waring Road and Intersection 11: College Boulevard/Vista Way.

The Recommended Alternative could potentially cause significant impacts at the College Boulevard segment from Waring Road to Vista Way based on the results of the roadway segment operations analysis. However, there is no feasible physical mitigation at this segment that would improve daily and peak hour roadway segment LOS due to right-of-way constraints. It should also be noted that significant and unavoidable impacts at the College Boulevard segment between Waring Road and Vista Way were already identified in the latest *Oceanside General Plan: Circulation Element* (2012), which includes a statement of overriding consideration for this segment. Therefore, the project does not result in any new impacts not already identified in the General Plan, and no mitigation measures are proposed.

6.0 VEHICLE MILES TRAVELED ASSESSMENT

On September 27, 2013, California Governor Jerry Brown signed SB 743 into law which requires an analysis of vehicle miles traveled (VMT) to identify transportation impacts in a project's environmental impact study. The Office of Planning and Research (OPR) is working on providing guidance on a threshold for determining a VMT impact. Draft guidelines have been released for comments, however no final guidance has been adopted.

The SB743 legislation also removes LOS as a CEQA threshold. Although LOS may not be used directly as a transportation impact for environmental review purposes under this legislation, it is unlikely that the City will have adopted a new methodology and impact significance criteria when the new CEQA guidelines are released and adopted. Therefore, due to the timing of this study and the timing of the CEQA transition, both VMT and LOS will be included in the traffic study to comprehensively evaluate the traffic impacts. However, because there are no thresholds for VMT, no VMT-related impacts for the study are identified

Vehicle miles traveled (VMT) is a measure of the distance that people will travel in a light duty truck or passenger automobile. The VMT generated by the Recommended Alternative is measured for the purpose of analyzing greenhouse gas and criteria pollutants generated by the transportation infrastructure project. Additionally, the VMT generated by the Circulation Element Alternative was also measured for comparison purposes and to determine the change in travel patterns due to not widening a section of the College Boulevard study corridor. The VMT was calculated by multiplying the number of daily trips by the trip length obtained from the SANDAG Series 12 traffic model runs for each of the two future alternatives; however, the resulting VMT for this assessment are very high-level in that they represent the model-wide VMT (i.e. the link length multiplied by the corresponding ADT traversing the link for all links in the SANDAG model). The 2035 daily VMT for the entire SANDAG model is 101,798,320 miles under the Circulation Element Alternative and 102,604,488 miles under the Recommended Alternative. The lower cumulative VMT figure is due to a lower average trip length, which reflects changes in travel behavior patterns with the six-lane widening of the entire study corridor length. Although the comparison in VMT figure between the two alternatives show an increase in the travel distance for drivers under the Recommended Alternative, the percentage increase from the Circulation Element VMT is less than 1% (i.e. a 0.79% increase) further indicating that the net effect of the Recommend Alternative improvements on regional VMT is negligible and not significant.

7.0 PEDESTRIAN & BICYCLE ANALYSIS

Improvements proposed under the Recommended Alternative include uniformly incorporating a 5-foot wide landscaped parkway and meandering sidewalk to provide a buffer for pedestrians and an opportunity to improve the aesthetic quality of the College Boulevard corridor. Since bicycle lanes exist along the corridor, the Recommended Alternative does not modify or improve the existing conditions. Pedestrian and bicycle conditions for the corridor with these improvements in place were evaluated using the Fehr & Peers developed analysis tool called LOS+. LOS+ is a link-based, planning-level evaluation tool that analyzes multi-modal LOS along the roadway segment by applying methodologies from the *Highway Capacity Manual 2010* to the pedestrian and bicycle LOS components. The results generated reflect the pedestrian and bicyclist perceptions of service and the traveling experience along the roadway. **Table 17** displays the LOS letter grade numerical equivalents used for the active transportation facilities.

TABLE 17: HCM 2010 LOS LETTER GRADE NUMERICAL EQUIVALENTS

Pedestrian/Bike LOS Score	LOS Letter Grade
Score $\leq$ 2.00	A
2.00 < Score $\leq$ 2.75	B
2.75 < Score $\leq$ 3.50	C
3.50 < Score $\leq$ 4.25	D
4.25 < Score $\leq$ 5.00	E
Score > 5.00	F

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

For a comprehensive comparison of the potential benefits and deficiencies related to the implementation of the proposed College Boulevard improvements, the pedestrian and bicycle LOS were generated under Existing Conditions and the Recommended Alternative. The sub-sections below discuss the resulting pedestrian and bicycle LOS. The respective LOS+ outputs are provided in **Appendix F**.

7.1.1 PEDESTRIAN LOS

The pedestrian LOS is a measure of the pedestrians' experiences walking along the roadway/sidewalk on the street segment in between the study intersections. Pedestrian LOS is a function of the following number of variables:

- Posted speed limit and makeup of the vehicular traffic
- Difficulty of crossing arterial
- Intersection crossing distance
- Number of vehicle lanes
- Lane width
- Width of sidewalk
- Parking occupancy
- Distance between controlled intersections
- Presence of mid-segment crossing
- Presence of a continuous visual barrier
- Buffer size (where the buffer is the area between the sidewalk and the curb)
- Directional vehicular traffic volumes
- Pedestrian density

Table 18 displays the pedestrian segment LOS in the study corridor under Existing (2014) Conditions and the Future (2035) with Recommended Alternative Conditions during the AM and PM peak hour. Pedestrians experience LOS D or better levels of service during the peak hours for most of the study corridor; however, there are some sections that operate deficiently despite the implementation of College Boulevard improvements. For example, the section of the corridor from Avenida De La Plata to Thunder Drive will continue to operate at LOS E or LOS F in at least one of the directions and in at least one of the peak hours under the Recommended Alternative. This deficient section of College Boulevard will be widened to six lanes to accommodate forecasted traffic volumes. However, the high directional vehicular traffic volumes through this section result in continued poor pedestrian LOS despite the additional travel lanes to accommodate the volumes and incorporation of landscaped buffers that separate pedestrians from traffic. Although the section between Avenida De La Plata and Olive Drive operates with unacceptable LOS from a pedestrian perspective, the pedestrian LOS score through this section does improve when compared to the LOS score reported under Existing Conditions due to the improvements.

From Olive Drive to Thunder Drive and from Roselle Street to Vista Way, the pedestrian LOS will be at LOS E or F in both directions and peak hours under the Recommended Alternative. The deficient operations along these College Boulevard segments are primarily due to the forecasted increased traffic demand and the cross-sections remaining at four lanes that would accommodate these high volumes.

TABLE 18: PEDESTRIAN SEGMENT LOS RESULTS

College Boulevard Segment	Existing (2014) Conditions								Future (2035) Conditions with Recommended Alternative							
	AM Peak Hour				PM Peak Hour				AM Peak Hour				PM Peak Hour			
	NB		SB		NB		SB		NB		SB		NB		SB	
	Score	LOS	Score	LOS	Score	LOS	Score	LOS	Score	LOS	Score	LOS	Score	LOS	Score	LOS
Old Grove Road to Avenida De La Plata	4.23	D	3.22	C	4.67	**E**	3.73	D	3.62	D	3.11	C	4.09	D	3.53	D
Avenida De La Plata to Aztec Street	4.66	**E**	4.55	**E**	5.31	**F**	5.20	**F**	3.74	D	3.80	D	4.33	**E**	4.32	**E**
Aztec Street to Oceanside Boulevard	4.57	**E**	4.22	D	5.23	**F**	4.96	**E**	3.67	D	3.59	D	4.30	**E**	4.21	D
Oceanside Boulevard to Olive Drive	5.45	**F**	5.36	**F**	5.62	**F**	5.62	**F**	4.55	**E**	4.62	**E**	4.68	**E**	4.91	**E**
Olive Drive to Thunder Drive	4.45	**E**	4.73	**E**	4.64	**E**	4.88	**E**	4.72	**E**	5.00	**E**	5.03	**F**	5.26	**F**
Thunder Drive to Marvin Street E	2.85	C	3.19	C	2.90	C	3.16	C	3.15	C	3.46	C	3.32	C	3.60	D
Marvin Street E to Marvin Street W	3.02	C	2.97	C	3.11	C	3.15	C	3.37	C	3.49	C	3.59	D	3.65	D
Marvin Street W to Roselle Street	3.07	C	3.08	C	3.29	C	3.22	C	3.57	D	3.71	D	3.90	D	4.00	D
Roselle Street to Barnard Drive/Waring Road	4.50	**E**	3.99	D	4.67	**E**	4.35	**E**	4.93	**E**	4.56	**E**	5.12	**F**	4.97	**E**
Barnard Drive/Waring Road to Vista Way	3.71	D	3.48	C	3.96	D	3.77	D	3.91	D	3.88	D	4.25	**E**	4.19	D
Vista Way to 78 EB Off-Ramp	3.88	D	N/A	N/A	4.10	D	N/A	N/A	3.98	D	N/A	N/A	4.18	D	N/A	N/A
78 EB Off-Ramp to Plaza Drive	3.36	C	N/A	N/A	3.65	D	N/A	N/A	3.53	D	N/A	N/A	3.82	D	N/A	N/A

Source: Fehr & Peers, 2016.

Bold letter indicates unacceptable LOS E or F.

N/A indicates no sidewalk provided along this portion of the roadway.

7.1.2 BICYCLE LOS

The bicycle LOS is a weighted combination of the bicyclists' experiences at intersections and on street links in between the intersections. Bicycle LOS is a function of the following five variables:

- Link length
- Bike lane width
- Lateral separation between bicycles and vehicular traffic
- Posted speed limit and makeup of the vehicular traffic
- Vehicle lane width
- Pavement conditions
- Directional vehicular traffic volumes
- Number of street access points
- Parking occupancy and shoulder parking width

Table 19 displays the bicycle segment LOS in the study corridor under Existing (2014) Conditions and the Future (2035) with Recommended Alternative Conditions during the AM and PM peak hour. As shown in the table, bicyclists primarily experience good levels of service (LOS C or better) when riding on segments along College Boulevard during the AM and PM peak hours according to the LOS+ calculations under both Existing and Future with Recommended Alternative Conditions. This is mostly due to the presence of designated bicycle facilities (Class II) through the study corridor. Bicyclists will continue to experience poor cycling conditions through the section between Marvin Street East and Roselle Street under the Recommended Alternative, because of the combination of relatively high vehicular traffic, the uncontrolled intersection operation at Marvin Street East, and the on-street parking along both sides of the roadway that could present "dooring" opportunities, would all contribute to the potential increase in bicycle-vehicle conflicts.

TABLE 19: BICYCLE SEGMENT LOS RESULTS

College Boulevard Segment	Existing (2014) Conditions								Future (2035) Conditions with Recommended Alternative							
	AM Peak Hour				PM Peak Hour				AM Peak Hour				PM Peak Hour			
	NB		SB		NB		SB		NB		SB		NB		SB	
	Score	LOS	Score	LOS	Score	LOS	Score	LOS	Score	LOS	Score	LOS	Score	LOS	Score	LOS
Old Grove Road to Avenida De La Plata	2.54	B	1.95	A	2.55	B	2.04	B	1.72	A	1.79	A	1.86	A	1.84	A
Avenida De La Plata to Aztec Street	2.80	C	2.12	B	2.91	C	2.23	B	1.77	A	1.83	A	1.93	A	1.91	A
Aztec Street to Oceanside Boulevard	2.55	B	1.60	A	2.64	B	1.73	A	1.25	A	1.35	A	1.44	A	1.47	A
Oceanside Boulevard to Olive Drive	2.58	B	2.13	B	2.59	B	2.16	B	1.53	A	1.54	A	1.55	A	1.58	A
Olive Drive to Thunder Drive	2.25	B	2.21	B	2.34	B	2.23	B	2.13	B	2.27	B	2.18	B	2.29	B
Thunder Drive to Marvin Street E	3.99	D	4.23	D	4.20	D	4.35	**E**	3.93	D	4.07	D	4.12	D	4.18	D
Marvin Street E to Marvin Street W	3.77	D	3.77	D	4.03	D	4.28	**E**	3.84	D	4.11	D	4.12	D	4.37	**E**
Marvin Street W to Roselle Street	3.77	D	3.83	D	4.44	**E**	4.34	**E**	4.18	D	4.37	**E**	4.63	**E**	4.72	**E**
Roselle Street to Barnard Drive/Waring Road	2.84	C	1.98	A	2.84	C	2.05	B	2.96	C	2.49	B	2.94	C	2.63	B
Barnard Drive/Waring Road to Vista Way	2.11	B	2.11	B	2.18	B	2.18	B	2.19	B	2.19	B	2.26	B	2.26	B
Vista Way to 78 EB Off-Ramp	1.96	A	1.91	A	2.01	B	1.96	A	2.02	B	1.98	A	2.06	B	2.03	B
78 EB Off-Ramp to Plaza Drive	1.63	A	1.99	A	1.71	A	2.07	B	1.71	A	2.07	B	1.78	A	2.14	B

Source: Fehr & Peers, 2016.

Bold letter indicates unacceptable LOS E or F.

8.0 RECOMMENDED ALTERNATIVE FINDINGS

A summary Under Future (2035) Conditions with Recommended Alternative, all intersections are forecast to operate within the City of Oceanside's acceptable level of service threshold of LOS D during both the AM and PM peak hours. The results of the Recommended Alternative's intersection analysis demonstrate that maintaining the four-lane cross-section along College Boulevard between Waring Road and Olive Drive would still serve the 2035 traffic volumes forecasted at each study intersection. Additionally, the average delay experienced per vehicle and resulting LOS at each study intersection under the Future Conditions with Recommended Alternative and the Future (2035) Conditions with General Plan Geometry/Intersection Configuration (Circulation Element Alternative) are fairly similar, with LOS-grade changes identified only at Intersection 5: College Boulevard/Olive Drive and Intersection 8: College Boulevard to West Marvin Street. Despite the change in LOS-grade, these intersections are projected to operate at acceptable LOS (less-than significant impact).

Under Future (2035) Conditions with Recommended Alternative, the daily roadway segment operations analysis determined that five study segments along the corridor are forecast to operate at LOS E or LOS F based on the daily segment (V/C) method:

- Segment #3: College Boulevard from Avenida De La Plata to Oceanside Boulevard
- Segment #4: College Boulevard from Oceanside Boulevard to Olive Drive
- Segment #5: College Boulevard from Olive Drive to Thunder Drive
- Segment #7: College Boulevard from Marvin Street to Waring Road
- Segment #8: College Boulevard from Barnard Drive/Waring Road to Vista Way

However, the peak hour segment analysis revealed acceptable level of service operations under the Future (2035) conditions for Segment #5 and Segment #7. Therefore, based on the peak hour segment analysis, the impact to these segments is less than significant.

Segment #3, Segment #4, and Segment #8 would operate at unacceptable levels of service based on the peak hour segment analysis and daily roadway segment analysis, under both the Future (2035) General Plan and Recommended Alternative scenarios. The *Oceanside General Plan: Circulation Element* (2012) includes a statement of overriding consideration for each of these segments. Therefore, the project does not result in any new impact not already identified in the General Plan, and no mitigations are proposed.

APPENDIX A: TRAFFIC COUNT & SPEED DATA

Prepared by National Data & Surveying Services

CLASSIFICATION

College Blvd Bet. Avenida Empressa & Old Grove Rd

Day: Thursday
Date: 9/13/2018

City: Oceanside
Project #: CA18_4320_001

Summary

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	154	18	0	8	6	4	1	2	0	1	0	0	194
01:00	0	103	11	4	11	10	5	2	1	0	2	0	0	149
02:00	0	105	13	0	8	6	2	2	2	0	2	0	0	140
03:00	0	117	16	0	13	1	1	0	1	0	3	0	0	152
04:00	0	247	30	0	27	0	0	2	3	0	0	0	0	309
05:00	2	611	95	1	51	0	0	1	6	0	1	0	0	768
06:00	4	1166	181	3	104	3	0	4	14	0	0	0	0	1479
07:00	8	1748	230	4	139	7	0	3	13	0	1	0	0	2153
08:00	7	1383	167	7	104	1	0	0	19	0	2	0	0	1690
09:00	4	1268	164	6	99	3	0	8	6	0	2	0	0	1560
10:00	3	1196	149	7	82	1	1	0	18	0	0	0	0	1457
11:00	2	1298	164	8	93	2	0	6	21	0	1	0	0	1595
12:00 PM	2	1322	172	3	99	2	0	4	8	0	1	0	0	1613
13:00	3	1417	178	6	92	1	0	6	20	1	0	0	0	1724
14:00	6	1732	194	5	100	4	0	5	8	0	0	0	0	2054
15:00	6	1815	229	5	116	1	1	4	9	0	0	0	0	2186
16:00	4	1783	222	3	102	3	0	2	9	0	0	0	0	2128
17:00	9	1827	227	3	98	1	0	2	4	0	0	0	0	2171
18:00	1	1575	187	2	85	1	0	3	9	0	0	0	0	1863
19:00	4	1353	155	2	63	0	0	2	13	0	1	0	0	1593
20:00	2	931	106	1	45	2	0	0	2	0	0	0	0	1089
21:00	0	796	86	1	28	1	0	1	3	0	0	0	0	916
22:00	1	498	50	0	21	0	1	0	1	0	1	0	0	573
23:00	1	275	25	0	11	1	1	1	2	0	2	0	0	319
Totals	69	24720	3069	71	1599	57	16	59	194	1	20			29875
% of Totals	0%	83%	10%	0%	5%	0%	0%	0%	1%	0%	0%			100%

AM Volumes	30	9396	1238	40	739	40	13	29	106	0	15	0	0	11646
% AM	0%	31%	4%	0%	2%	0%	0%	0%	0%		0%			39%
AM Peak Hour	07:00	07:00	07:00	11:00	07:00	01:00	01:00	09:00	11:00		03:00			07:00
Volume	8	1748	230	8	139	10	5	8	21		3			2153
PM Volumes	39	15324	1831	31	860	17	3	30	88	1	5	0	0	18229
% PM	0%	51%	6%	0%	3%	0%	0%	0%	0%	0%	0%			61%
PM Peak Hour	17:00	17:00	15:00	13:00	15:00	14:00	15:00	13:00	13:00	13:00	23:00			15:00
Volume	9	1827	229	6	116	4	1	6	20	1	2			2186

Directional Peak Periods	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
All Classes	Volume	%	Volume	%	Volume	%	Volume	%
	3843	13%	3337	11%	4299	14%	18396	62%

Classification Definitions

1 Motorcycles
2 Passenger Cars
3 2-Axle, 4-Tire Single Units
4 Buses
5 2-Axle, 6-Tire Single Units
6 3-Axle Single Units
7 > =4-Axle Single Units
8 <=4-Axle Single Trailers
9 5-Axle Single Trailers
10 >=6-Axle Single Trailers
11 <=5-Axle Multi-Trailers
12 6-Axle Multi-Trailers
13 >=7-Axle Multi-Trailers

SPEED

College Blvd Bet. Avenida Empressa & Old Grove Rd

Day: Thursday
Date: 9/13/2018

City: Oceanside
Project #: CA18_4320_001

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	0	1	1	13	44	64	43	19	8	1	0	**194**
01:00	0	0	0	0	2	13	34	43	34	16	5	2	0	**149**
02:00	0	0	2	0	5	10	32	42	28	14	4	0	3	**140**
03:00	0	0	0	0	5	9	29	40	39	20	6	4	0	**152**
04:00	0	0	0	0	3	17	51	86	88	37	21	3	3	**309**
05:00	0	0	0	1	10	50	142	254	204	78	25	3	1	**768**
06:00	0	0	0	3	23	125	363	495	327	107	32	3	1	**1479**
07:00	2	6	9	29	78	227	567	681	410	116	27	1	0	**2153**
08:00	0	0	0	6	29	132	418	553	398	127	25	1	1	**1690**
09:00	0	0	1	4	24	102	343	539	397	127	21	2	0	**1560**
10:00	0	0	0	1	20	92	279	483	399	151	29	2	1	**1457**
11:00	1	0	0	3	19	92	335	586	388	137	28	5	1	**1595**
12:00 PM	0	0	0	1	12	83	308	580	461	135	30	3	0	**1613**
13:00	0	0	0	3	16	110	348	642	441	133	26	5	0	**1724**
14:00	0	0	1	3	21	153	472	722	498	151	30	3	0	**2054**
15:00	0	0	1	5	32	215	522	764	485	132	24	6	0	**2186**
16:00	0	0	0	1	21	144	558	787	458	123	29	7	0	**2128**
17:00	0	0	0	2	30	155	501	830	493	127	24	7	2	**2171**
18:00	0	0	0	3	21	124	456	694	422	114	23	6	0	**1863**
19:00	0	0	0	4	41	204	455	515	280	77	17	0	0	**1593**
20:00	0	0	1	0	17	92	269	409	211	74	15	1	0	**1089**
21:00	0	0	0	0	14	64	232	326	210	58	11	0	1	**916**
22:00	0	0	0	0	6	26	104	209	152	55	20	1	0	**573**
23:00	0	0	0	1	2	20	53	115	87	32	6	0	3	**319**
Totals	**3**	**6**	**15**	**71**	**452**	**2272**	**6915**	**10459**	**6953**	**2160**	**486**	**66**	**17**	**29875**
% of Totals	0%	0%	0%	0%	2%	8%	23%	35%	23%	7%	2%	0%	0%	100%

AM Volumes	3	6	12	48	219	882	2637	3866	2755	949	231	27	11	11646
% AM	0%	0%	0%	0%	1%	3%	9%	13%	9%	3%	1%	0%	0%	39%
AM Peak Hour	07:00	07:00	07:00	07:00	07:00	07:00	07:00	07:00	07:00	10:00	06:00	11:00	02:00	07:00
Volume	2	6	9	29	78	227	567	681	410	151	32	5	3	2153
PM Volumes	0	0	3	23	233	1390	4278	6593	4198	1211	255	39	6	18229
% PM			0%	0%	1%	5%	14%	22%	14%	4%	1%	0%	0%	61%
PM Peak Hour			14:00	15:00	19:00	15:00	16:00	17:00	14:00	14:00	12:00	16:00	23:00	15:00
Volume			1	5	41	215	558	830	498	151	30	7	3	2186

Directional Peak Periods	**AM 7-9**			**NOON 12-2**			**PM 4-6**			**Off Peak Volumes**		
All Speeds	Volume	↔	%	Volume	↔	%	Volume	↔	%	Volume	↔	%
	3843		13%	3337		11%	4299		14%	18396		62%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
College Blvd	Summary	41	47	47	54	58	29875

Prepared by National Data & Surveying Services

CLASSIFICATION

College Blvd Bet. Old Grove Rd & Avenida De La Plata

Day: Thursday
Date: 9/13/2018

City: Oceanside
Project #: CA18_4320_002

Summary

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	178	19	0	14	6	4	1	0	0	0	0	0	222
01:00	1	120	17	2	11	12	5	1	0	0	0	0	0	169
02:00	0	107	15	0	12	6	2	1	1	0	0	0	0	144
03:00	0	128	17	0	12	1	1	0	1	0	0	0	0	160
04:00	1	301	43	0	36	1	0	0	4	0	0	0	0	386
05:00	3	759	114	4	76	2	0	1	6	0	0	0	0	965
06:00	1	1462	219	8	146	0	0	3	20	0	0	0	0	1859
07:00	3	2162	276	9	167	4	1	2	11	0	0	0	0	2635
08:00	3	1743	217	8	138	6	0	0	15	0	0	0	0	2130
09:00	3	1632	221	5	133	1	0	6	8	0	0	0	0	2009
10:00	2	1562	203	6	107	2	1	0	14	0	0	0	0	1897
11:00	3	1771	217	8	133	4	0	6	11	0	0	0	0	2153
12:00 PM	2	1821	243	5	139	4	0	2	6	0	0	0	0	2222
13:00	3	1826	235	4	136	1	0	3	15	0	0	0	0	2223
14:00	4	2184	257	5	147	5	0	4	11	0	0	0	0	2617
15:00	9	2259	288	5	158	5	0	3	10	0	0	0	0	2737
16:00	6	2235	304	4	139	6	1	0	9	0	0	0	0	2704
17:00	9	2268	265	3	132	3	0	1	11	0	0	0	0	2692
18:00	3	2000	231	2	114	2	0	1	12	0	0	0	0	2365
19:00	2	1841	215	2	102	1	0	0	6	0	0	0	0	2169
20:00	5	1231	137	2	65	2	0	0	5	0	0	0	0	1447
21:00	0	1003	114	1	44	1	0	0	4	0	0	0	0	1167
22:00	1	626	72	0	28	0	0	0	0	0	0	0	0	727
23:00	1	351	42	0	17	1	1	1	2	0	0	0	0	416
Totals	65	31570	3981	83	2206	76	16	36	182					38215
% of Totals	0%	83%	10%	0%	6%	0%	0%	0%	0%					100%

AM Volumes	20	11925	1578	50	985	45	14	21	91	0	0	0	0	14729
% AM	0%	31%	4%	0%	3%	0%	0%	0%	0%					39%
AM Peak Hour	05:00	07:00	07:00	07:00	07:00	01:00	01:00	09:00	06:00					07:00
Volume	3	2162	276	9	167	12	5	6	20					2635
PM Volumes	45	19645	2403	33	1221	31	2	15	91	0	0	0	0	23486
% PM	0%	51%	6%	0%	3%	0%	0%	0%	0%					61%
PM Peak Hour	15:00	17:00	16:00	12:00	15:00	16:00	16:00	14:00	13:00					15:00
Volume	9	2268	304	5	158	6	1	4	15					2737

Directional Peak Periods	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
All Classes	Volume	↔	%	Volume	↔	%	Volume	↔	%	Volume	↔	%
	4765		12%	4445		12%	5396		14%	23609		62%

Classification Definitions

1 Motorcycles
2 Passenger Cars
3 2-Axle, 4-Tire Single Units
4 Buses
5 2-Axle, 6-Tire Single Units
6 3-Axle Single Units
7 > =4-Axle Single Units
8 <=4-Axle Single Trailers
9 5-Axle Single Trailers
10 >=6-Axle Single Trailers
11 <=5-Axle Multi-Trailers
12 6-Axle Multi-Trailers
13 >=7-Axle Multi-Trailers

Prepared by National Data & Surveying Services

SPEED

College Blvd Bet. Old Grove Rd & Avenida De La Plata

Day: Thursday
Date: 9/13/2018

City: Oceanside
Project #: CA18_4320_002

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	2	0	0	5	40	58	73	33	9	2	0	0	**222**
01:00	0	0	1	2	8	26	52	48	24	8	0	0	0	**169**
02:00	0	0	3	2	7	20	32	49	21	9	1	0	0	**144**
03:00	0	0	3	1	8	7	33	50	33	19	6	0	0	**160**
04:00	0	0	0	2	9	40	69	117	93	46	9	1	0	**386**
05:00	0	0	1	7	27	107	263	312	179	58	9	2	0	**965**
06:00	2	9	5	41	124	343	642	488	171	31	3	0	0	**1859**
07:00	22	38	75	133	249	580	880	504	134	17	3	0	0	**2635**
08:00	1	0	6	40	136	405	794	579	146	22	1	0	0	**2130**
09:00	1	5	4	23	73	344	821	578	137	23	0	0	0	**2009**
10:00	1	2	10	32	83	341	662	552	178	34	2	0	0	**1897**
11:00	1	4	11	43	130	433	817	539	146	23	5	1	0	**2153**
12:00 PM	1	4	22	30	104	446	850	587	153	23	2	0	0	**2222**
13:00	6	5	20	45	163	431	820	577	127	25	3	1	0	**2223**
14:00	0	0	21	61	188	662	936	560	162	21	4	2	0	**2617**
15:00	2	7	33	74	254	710	921	575	144	17	0	0	0	**2737**
16:00	7	13	34	85	242	653	972	531	138	26	3	0	0	**2704**
17:00	5	7	27	99	257	654	986	515	119	21	2	0	0	**2692**
18:00	2	2	8	48	254	614	866	449	109	11	2	0	0	**2365**
19:00	6	1	16	95	277	605	723	349	82	14	1	0	0	**2169**
20:00	0	0	3	15	142	387	505	299	79	12	5	0	0	**1447**
21:00	0	0	0	11	88	301	402	248	96	18	2	1	0	**1167**
22:00	0	0	0	0	12	114	273	197	103	23	5	0	0	**727**
23:00	0	1	3	1	15	55	133	129	60	17	2	0	0	**416**
Totals	**57**	**100**	**306**	**890**	**2855**	**8318**	**13510**	**8905**	**2667**	**527**	**72**	**8**		**38215**
% of Totals	0%	0%	1%	2%	7%	22%	35%	23%	7%	1%	0%	0%		100%

AM Volumes	28	60	119	326	859	2686	5123	3889	1295	299	41	4	0	14729
% AM	0%	0%	0%	1%	2%	7%	13%	10%	3%	1%	0%	0%		39%
AM Peak Hour	07:00	07:00	07:00	07:00	07:00	07:00	07:00	08:00	05:00	05:00	04:00	05:00		07:00
Volume	22	38	75	133	249	580	880	579	179	58	9	2		2635
PM Volumes	29	40	187	564	1996	5632	8387	5016	1372	228	31	4	0	23486
% PM	0%	0%	0%	1%	5%	15%	22%	13%	4%	1%	0%	0%		61%
PM Peak Hour	16:00	16:00	16:00	17:00	19:00	15:00	17:00	12:00	14:00	16:00	20:00	14:00		15:00
Volume	7	13	34	99	277	710	986	587	162	26	5	2		2737

Directional Peak Periods	**AM 7-9**			**NOON 12-2**			**PM 4-6**			**Off Peak Volumes**		
All Speeds	Volume	↔	%	Volume	↔	%	Volume	↔	%	Volume	↔	%
	4765		12%	4445		12%	5396		14%	23609		62%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
College Blvd	Summary	36	42	42	49	53	38215

Prepared by National Data & Surveying Services

CLASSIFICATION

College Blvd Bet. Aztec St & Oceanside Blvd

Day: Thursday
Date: 9/13/2018

City: Oceanside
Project #: CA18_4320_003

Summary

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	202	20	0	4	2	0	0	2	0	0	0	0	230
01:00	1	130	13	0	10	1	0	0	0	0	0	0	0	155
02:00	0	117	7	0	7	0	2	0	1	0	0	0	0	134
03:00	1	124	15	0	14	0	0	0	0	0	0	0	0	154
04:00	1	288	47	2	26	0	0	1	0	0	0	0	0	365
05:00	2	735	117	3	81	0	0	0	0	0	0	0	0	938
06:00	4	1460	229	2	124	1	0	1	1	0	0	0	1	1823
07:00	1	1857	266	7	159	3	0	4	4	0	0	2	0	2303
08:00	4	1692	226	3	138	2	1	0	2	0	0	0	1	2069
09:00	2	1561	227	2	115	5	0	1	4	0	0	0	0	1917
10:00	3	1520	214	6	130	3	0	2	2	0	0	0	0	1880
11:00	5	1643	226	6	124	6	0	3	2	0	0	0	0	2015
12:00 PM	4	1775	212	3	150	5	0	2	2	0	0	0	0	2153
13:00	4	1807	219	7	126	3	0	1	2	0	0	0	0	2169
14:00	4	2088	253	3	166	7	2	3	3	0	0	1	1	2531
15:00	6	2176	288	4	156	1	0	0	1	0	0	0	0	2632
16:00	8	2169	282	5	141	1	0	1	4	0	0	0	0	2611
17:00	5	2240	264	8	132	2	0	2	2	0	0	0	1	2656
18:00	4	2000	253	4	108	0	0	0	0	0	0	0	0	2369
19:00	3	1779	188	6	96	0	0	0	0	0	0	0	0	2072
20:00	3	1227	153	2	68	0	0	0	1	0	0	0	0	1454
21:00	0	1046	97	1	54	0	0	1	0	0	0	0	0	1199
22:00	3	625	76	0	42	0	0	0	0	0	0	0	0	746
23:00	1	349	34	0	12	0	0	0	0	0	0	0	0	396
Totals	69	30610	3926	74	2183	42	5	22	33			3	4	36971
% of Totals	0%	83%	11%	0%	6%	0%	0%	0%	0%			0%	0%	100%

AM Volumes	24	11329	1607	31	932	23	3	12	18	0	0	2	2	13983
% AM	0%	31%	4%	0%	3%	0%	0%	0%	0%			0%	0%	38%
AM Peak Hour	11:00	07:00	07:00	07:00	07:00	11:00	02:00	07:00	07:00			07:00	06:00	07:00
Volume	5	1857	266	7	159	6	2	4	4			2	1	2303
PM Volumes	45	19281	2319	43	1251	19	2	10	15	0	0	1	2	22988
% PM	0%	52%	6%	0%	3%	0%	0%	0%	0%			0%	0%	62%
PM Peak Hour	16:00	17:00	15:00	17:00	14:00	14:00	14:00	14:00	16:00			14:00	14:00	17:00
Volume	8	2240	288	8	166	7	2	3	4			1	1	2656

Directional Peak Periods	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
All Classes	Volume	↔	%	Volume	↔	%	Volume	↔	%	Volume	↔	%
	4372		12%	4322		12%	5267		14%	23010		62%

Classification Definitions

1 Motorcycles
2 Passenger Cars
3 2-Axle, 4-Tire Single Units
4 Buses
5 2-Axle, 6-Tire Single Units
6 3-Axle Single Units
7 > =4-Axle Single Units
8 <=4-Axle Single Trailers
9 5-Axle Single Trailers
10 >=6-Axle Single Trailers
11 <=5-Axle Multi-Trailers
12 6-Axle Multi-Trailers
13 >=7-Axle Multi-Trailers

Prepared by National Data & Surveying Services

SPEED

College Blvd Bet. Aztec St & Oceanside Blvd

Day: Thursday
Date: 9/13/2018

City: Oceanside
Project #: CA18_4320_003

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	0	4	12	27	72	69	37	8	1	0	0	**230**
01:00	0	0	0	3	11	25	46	45	20	5	0	0	0	**155**
02:00	1	0	2	2	10	12	32	34	28	9	3	0	0	**133**
03:00	0	0	1	2	3	14	39	49	31	11	4	0	0	**154**
04:00	0	0	1	1	15	23	74	113	94	37	7	0	0	**365**
05:00	0	1	4	11	41	102	255	300	175	41	6	2	0	**938**
06:00	39	39	56	85	141	294	488	427	208	41	5	0	0	**1823**
07:00	169	153	145	84	108	292	603	525	187	33	4	0	0	**2303**
08:00	64	58	51	54	132	330	598	533	211	35	3	0	0	**2069**
09:00	0	8	16	38	133	357	645	519	182	19	0	0	0	**1917**
10:00	0	1	6	27	121	285	597	612	201	29	1	0	0	**1880**
11:00	0	0	2	35	121	371	697	596	174	17	2	0	0	**2015**
12:00 PM	1	1	9	26	121	284	765	700	223	20	3	0	0	**2153**
13:00	3	3	9	34	98	316	739	681	240	38	8	0	0	**2169**
14:00	83	60	46	53	147	392	824	685	215	22	3	1	0	**2531**
15:00	13	19	27	43	168	362	855	823	280	39	3	0	0	**2632**
16:00	4	12	20	44	129	412	831	854	261	39	4	1	0	**2611**
17:00	44	28	37	64	137	381	899	812	226	25	3	0	0	**2656**
18:00	2	4	6	29	99	350	823	788	223	41	4	0	0	**2369**
19:00	4	2	9	24	125	377	843	553	116	17	2	0	0	**2072**
20:00	0	0	0	16	46	187	589	465	118	32	1	0	0	**1454**
21:00	0	0	1	14	37	182	411	405	128	17	4	0	0	**1199**
22:00	0	0	0	7	22	60	241	256	127	30	3	0	0	**746**
23:00	0	0	0	6	13	32	118	135	71	17	2	2	0	**396**
Totals	**427**	**389**	**448**	**706**	**1990**	**5467**	**12084**	**10979**	**3776**	**622**	**76**	**6**		**36970**
% of Totals	1%	1%	1%	2%	5%	15%	33%	30%	10%	2%	0%	0%		100%

AM Volumes	273	260	284	346	848	2132	4146	3822	1548	285	36	2	0	13982
% AM	1%	1%	1%	1%	2%	6%	11%	10%	4%	1%	0%	0%		38%
AM Peak Hour	07:00	07:00	07:00	06:00	06:00	11:00	11:00	10:00	08:00	05:00	04:00	05:00		07:00
Volume	169	153	145	85	141	371	697	612	211	41	7	2		2303
PM Volumes	154	129	164	360	1142	3335	7938	7157	2228	337	40	4	0	22988
% PM	0%	0%	0%	1%	3%	9%	21%	19%	6%	1%	0%	0%		62%
PM Peak Hour	14:00	14:00	14:00	17:00	15:00	16:00	17:00	16:00	15:00	18:00	13:00	23:00		17:00
Volume	83	60	46	64	168	412	899	854	280	41	8	2		2656

Directional Peak Periods	**AM 7-9**			**NOON 12-2**			**PM 4-6**			**Off Peak Volumes**		
All Speeds	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%
	4372		12%	4322		12%	5267		14%	23009		62%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
College Blvd	Summary	36	44	43	50	53	36970

Prepared by National Data & Surveying Services

CLASSIFICATION

College Blvd Bet. Oceanside Blvd & Olive Dr

Day: Thursday
Date: 9/13/2018

City: Oceanside
Project #: CA18_4320_004

Summary

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	208	40	2	11	4	3	1	0	0	0	0	0	269
01:00	0	161	13	1	12	5	2	0	1	0	0	0	0	195
02:00	1	144	22	0	14	4	2	1	0	0	0	0	0	188
03:00	2	133	13	2	18	0	1	0	0	0	1	0	0	170
04:00	3	380	62	0	25	1	0	1	0	0	1	0	0	473
05:00	1	964	149	11	101	0	0	2	1	0	1	0	0	1230
06:00	0	2010	295	7	182	2	0	6	3	0	0	0	0	2505
07:00	7	2923	347	9	223	3	0	12	4	0	0	0	0	3528
08:00	5	2595	313	10	211	5	0	10	1	0	2	0	0	3152
09:00	5	2123	288	11	226	4	0	3	6	0	0	0	0	2666
10:00	4	2037	265	13	174	4	0	6	5	0	0	0	0	2508
11:00	7	2206	274	8	203	4	0	4	3	0	0	0	0	2709
12:00 PM	3	2393	273	6	225	5	0	10	2	0	0	0	0	2917
13:00	7	2418	296	15	216	4	0	14	6	0	1	0	0	2977
14:00	5	2658	338	7	214	5	0	16	6	0	2	0	0	3251
15:00	6	2871	375	15	214	8	0	22	3	0	2	0	0	3516
16:00	5	3048	345	13	202	2	0	13	6	0	1	0	0	3635
17:00	9	3012	318	13	195	4	0	9	4	0	2	0	0	3566
18:00	3	2544	278	3	175	0	0	19	0	0	2	0	0	3024
19:00	5	2177	225	2	159	0	0	16	1	0	0	0	0	2585
20:00	1	1626	173	5	107	1	0	9	1	0	1	0	0	1924
21:00	0	1306	133	1	69	0	0	6	0	0	1	0	0	1516
22:00	0	817	83	2	29	0	0	2	0	0	0	0	0	933
23:00	0	433	48	0	22	0	0	2	1	0	0	0	0	506
Totals	79	41187	4966	156	3227	65	8	184	54		17			49943
% of Totals	0%	82%	10%	0%	6%	0%	0%	0%	0%		0%			100%

AM Volumes	35	15884	2081	74	1400	36	8	46	24	0	5	0	0	19593
% AM	0%	32%	4%	0%	3%	0%	0%	0%	0%		0%			39%
AM Peak Hour	07:00	07:00	07:00	10:00	09:00	01:00		07:00	09:00		08:00			07:00
Volume	7	2923	347	13	226	5	3	12	6		2			3528
PM Volumes	44	25303	2885	82	1827	29	0	138	30	0	12	0	0	30350
% PM	0%	51%	6%	0%	4%	0%		0%	0%		0%			61%
PM Peak Hour	17:00	16:00	15:00	13:00	12:00	15:00		15:00	13:00		14:00			16:00
Volume	9	3048	375	15	225	8		22	6		2			3635

Directional Peak Periods	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
All Classes	Volume	%	Volume	%	Volume	%	Volume	%
	6680 ⟷	13%	5894 ⟷	12%	7201 ⟷	14%	30168 ⟷	60%

Classification Definitions

1 Motorcycles
2 Passenger Cars
3 2-Axle, 4-Tire Single Units
4 Buses
5 2-Axle, 6-Tire Single Units
6 3-Axle Single Units
7 > =4-Axle Single Units
8 <=4-Axle Single Trailers
9 5-Axle Single Trailers
10 >=6-Axle Single Trailers
11 <=5-Axle Multi-Trailers
12 6-Axle Multi-Trailers
13 >=7-Axle Multi-Trailers

Prepared by National Data & Surveying Services

SPEED

College Blvd Bet. Oceanside Blvd & Olive Dr

Day: Thursday
Date: 9/13/2018

City: Oceanside
Project #: CA18_4320_004

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	4	7	20	58	107	55	16	2	0	0	0	0	**269**
01:00	3	10	8	24	46	58	31	10	3	2	0	0	0	**195**
02:00	0	1	6	11	44	62	45	13	5	1	0	0	0	**188**
03:00	2	2	4	11	46	65	26	9	5	0	0	0	0	**170**
04:00	4	7	17	19	82	164	135	39	6	0	0	0	0	**473**
05:00	14	25	27	89	234	371	294	137	36	3	0	0	0	**1230**
06:00	44	79	142	324	550	709	466	163	24	4	0	0	0	**2505**
07:00	188	266	407	562	811	737	424	103	29	0	0	0	1	**3528**
08:00	153	201	319	517	746	715	375	109	15	2	0	0	0	**3152**
09:00	101	127	194	414	680	698	364	71	15	2	0	0	0	**2666**
10:00	36	53	161	364	750	711	318	93	19	3	0	0	0	**2508**
11:00	100	133	173	383	734	739	343	84	18	2	0	0	0	**2709**
12:00 PM	99	157	275	407	738	768	371	95	6	1	0	0	0	**2917**
13:00	149	202	255	375	736	757	398	88	16	1	0	0	0	**2977**
14:00	265	374	468	529	667	575	295	70	8	0	0	0	0	**3251**
15:00	263	282	439	634	769	684	332	91	19	3	0	0	0	**3516**
16:00	247	264	453	679	852	712	324	91	12	1	0	0	0	**3635**
17:00	289	314	480	642	738	644	321	116	19	1	2	0	0	**3566**
18:00	214	258	365	469	677	650	273	93	22	3	0	0	0	**3024**
19:00	140	199	302	456	617	528	246	86	9	1	1	0	0	**2585**
20:00	32	48	105	236	578	607	240	67	9	1	1	0	0	**1924**
21:00	12	11	28	112	454	580	242	55	19	3	0	0	0	**1516**
22:00	4	5	0	26	173	368	257	76	18	6	0	0	0	**933**
23:00	6	8	12	27	76	178	132	51	14	2	0	0	0	**506**
Totals	**2365**	**3030**	**4647**	**7330**	**11856**	**12187**	**6307**	**1826**	**348**	**42**	**4**		**1**	**49943**
% of Totals	5%	6%	9%	15%	24%	24%	13%	4%	1%	0%	0%		0%	100%

AM Volumes	645	908	1465	2738	4781	5136	2876	847	177	19	0	0	1	19593
% AM	1%	2%	3%	5%	10%	10%	6%	2%	0%	0%			0%	39%
AM Peak Hour	07:00	07:00	07:00	07:00	07:00	11:00	06:00	06:00	05:00	06:00			07:00	07:00
Volume	188	266	407	562	811	739	466	163	36	4			1	3528
PM Volumes	1720	2122	3182	4592	7075	7051	3431	979	171	23	4	0	0	30350
% PM	3%	4%	6%	9%	14%	14%	7%	2%	0%	0%	0%			61%
PM Peak Hour	17:00	14:00	17:00	16:00	16:00	12:00	13:00	17:00	18:00	22:00	17:00			16:00
Volume	289	374	480	679	852	768	398	116	22	6	2			3635

Directional Peak Periods	**AM 7-9**			**NOON 12-2**			**PM 4-6**			**Off Peak Volumes**		
All Speeds	Volume	↔	%	Volume	↔	%	Volume	↔	%	Volume	↔	%
	6680		13%	5894		12%	7201		14%	30168		60%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
College Blvd	Summary	22	33	32	41	45	49943

Prepared by National Data & Surveying Services

CLASSIFICATION

College Blvd Bet. Olive Dr & Thunder Dr

Day: Thursday
Date: 9/13/2018

City: Oceanside
Project #: CA18_4320_005

Summary

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	1	221	14	1	15	7	4	0	0	0	0	0	0	263
01:00	0	138	16	1	5	0	2	1	0	0	0	0	0	163
02:00	0	151	12	0	5	0	0	1	1	0	0	0	0	170
03:00	0	155	10	3	12	0	0	0	1	0	2	0	0	183
04:00	0	284	28	3	22	0	0	0	1	0	2	0	0	340
05:00	2	718	86	4	63	0	0	1	1	0	1	0	0	876
06:00	6	1424	184	10	111	1	0	6	3	0	0	0	0	1745
07:00	7	2035	238	8	141	1	0	11	0	0	1	0	0	2442
08:00	6	1749	209	13	138	0	0	10	1	0	0	0	0	2126
09:00	11	1549	194	9	113	2	0	9	1	0	0	0	0	1888
10:00	3	1495	179	11	100	0	0	7	1	0	0	0	0	1796
11:00	1	1602	204	11	120	1	0	8	0	0	1	0	0	1948
12:00 PM	2	1716	185	9	111	2	0	10	0	0	0	0	0	2035
13:00	1	1854	207	9	142	1	0	3	3	0	0	0	0	2220
14:00	7	2089	235	4	146	2	0	10	0	0	2	0	0	2495
15:00	7	2225	251	7	156	5	0	17	1	0	5	0	0	2674
16:00	5	2173	235	14	147	1	0	12	0	0	3	0	0	2590
17:00	7	2251	239	15	146	1	0	15	1	0	3	0	0	2678
18:00	7	1831	177	7	110	0	0	6	0	0	0	0	0	2138
19:00	2	1510	152	5	101	1	0	7	0	0	0	0	0	1778
20:00	1	1129	115	3	70	0	0	7	1	0	1	0	0	1327
21:00	0	901	78	4	52	0	0	7	0	0	1	0	0	1043
22:00	0	545	43	0	19	0	0	1	0	0	0	0	0	608
23:00	1	343	34	0	12	0	0	1	0	0	0	0	0	391
Totals	77	30088	3325	151	2057	25	6	150	16		22			35917
% of Totals	0%	84%	9%	0%	6%	0%	0%	0%	0%		0%			100%

AM Volumes	37	11521	1374	74	845	12	6	54	10	0	7	0	0	13940
% AM	0%	32%	4%	0%	2%	0%	0%	0%	0%		0%			39%
AM Peak Hour	09:00	07:00	07:00	08:00	07:00			07:00	06:00		03:00			07:00
Volume	11	2035	238	13	141	7	4	11	3		2			2442
PM Volumes	40	18567	1951	77	1212	13	0	96	6	0	15	0	0	21977
% PM	0%	52%	5%	0%	3%	0%		0%	0%		0%			61%
PM Peak Hour	14:00	17:00	15:00	17:00	15:00	15:00		15:00	13:00		15:00			17:00
Volume	7	2251	251	15	156	5		17	3		5			2678

Directional Peak Periods	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
All Classes	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%
	4568		13%	4255		12%	5268		15%	21826		61%

Classification Definitions

1 Motorcycles
2 Passenger Cars
3 2-Axle, 4-Tire Single Units
4 Buses
5 2-Axle, 6-Tire Single Units
6 3-Axle Single Units
7 > =4-Axle Single Units
8 <=4-Axle Single Trailers
9 5-Axle Single Trailers
10 >=6-Axle Single Trailers
11 <=5-Axle Multi-Trailers
12 6-Axle Multi-Trailers
13 >=7-Axle Multi-Trailers

Prepared by National Data & Surveying Services

SPEED

College Blvd Bet. Olive Dr & Thunder Dr

Day: Thursday
Date: 9/13/2018

City: Oceanside
Project #: CA18_4320_005

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	5	3	5	17	52	85	67	24	4	1	0	0	263
01:00	1	1	2	3	13	33	52	44	9	5	0	0	0	163
02:00	0	0	4	6	6	30	64	40	14	6	0	0	0	170
03:00	0	0	1	8	8	28	64	54	11	9	0	0	0	183
04:00	1	1	3	6	11	33	109	115	45	14	2	0	0	340
05:00	1	3	4	7	27	97	211	263	196	58	8	1	0	876
06:00	4	6	6	25	86	216	541	510	260	83	8	0	0	1745
07:00	95	69	46	48	124	372	754	600	270	58	5	1	0	2442
08:00	20	14	18	46	133	378	681	549	254	29	3	1	0	2126
09:00	0	2	4	20	80	243	556	650	281	46	6	0	0	1888
10:00	1	2	5	23	90	256	543	555	260	54	6	1	0	1796
11:00	2	3	17	40	98	316	572	600	249	48	3	0	0	1948
12:00 PM	11	16	21	44	86	268	589	637	287	66	9	1	0	2035
13:00	13	20	46	50	127	315	632	674	280	57	6	0	0	2220
14:00	101	64	75	128	176	363	658	614	232	76	8	0	0	2495
15:00	153	117	142	144	210	366	629	593	254	60	6	0	0	2674
16:00	99	101	137	141	221	392	605	576	253	56	8	1	0	2590
17:00	144	184	185	191	222	379	585	501	228	49	10	0	0	2678
18:00	42	60	94	115	182	402	525	475	195	40	8	0	0	2138
19:00	43	32	60	90	212	368	493	323	127	24	5	1	0	1778
20:00	6	5	7	20	96	262	443	333	136	17	2	0	0	1327
21:00	1	1	3	12	55	179	381	276	106	25	4	0	0	1043
22:00	0	0	0	1	9	66	169	204	119	35	5	0	0	608
23:00	0	0	0	1	14	47	106	133	64	19	6	1	0	391
Totals	738	706	883	1174	2303	5461	10047	9386	4154	938	119	8		35917
% of Totals	2%	2%	2%	3%	6%	15%	28%	26%	12%	3%	0%	0%		100%

AM Volumes	125	106	113	237	693	2054	4232	4047	1873	414	42	4	0	13940
% AM	0%	0%	0%	1%	2%	6%	12%	11%	5%	1%	0%	0%		39%
AM Peak Hour	07:00	07:00	07:00	07:00	08:00	08:00	07:00	09:00	09:00	06:00	05:00	05:00		07:00
Volume	95	69	46	48	133	378	754	650	281	83	8	1		2442
PM Volumes	613	600	770	937	1610	3407	5815	5339	2281	524	77	4	0	21977
% PM	2%	2%	2%	3%	4%	9%	16%	15%	6%	1%	0%	0%		61%
PM Peak Hour	15:00	17:00	17:00	17:00	17:00	18:00	14:00	13:00	12:00	14:00	17:00	12:00		17:00
Volume	153	184	185	191	222	402	658	674	287	76	10	1		2678

Directional Peak Periods All Speeds	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%
	4568 ⟷	13%	4255 ⟷	12%	5268 ⟷	15%	21826 ⟷	61%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
College Blvd	Summary	34	43	42	50	54	35917

Prepared by National Data & Surveying Services

CLASSIFICATION

College Blvd Bet. Thunder Dr & Marvin St

Day: Thursday
Date: 9/13/2018

City: Oceanside
Project #: CA18_4320_006

Summary

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	160	24	1	7	2	0	1	0	0	0	0	0	195
01:00	0	99	10	1	0	0	0	0	0	0	0	0	0	110
02:00	0	127	4	0	0	0	0	0	2	0	0	0	0	133
03:00	1	124	13	0	8	0	0	0	4	0	0	0	0	150
04:00	1	264	35	2	13	0	0	1	8	0	1	0	0	325
05:00	3	648	102	0	33	0	0	0	10	0	1	0	0	797
06:00	3	1290	215	3	79	1	0	0	13	0	0	0	0	1604
07:00	3	1712	238	2	69	1	0	3	10	0	0	0	0	2038
08:00	3	1551	223	3	77	0	0	5	4	0	0	0	0	1866
09:00	3	1390	198	6	90	3	0	1	5	0	0	0	0	1696
10:00	4	1353	195	6	69	4	0	0	6	0	0	0	0	1637
11:00	2	1483	226	3	74	1	0	0	7	0	0	0	0	1796
12:00 PM	3	1598	189	3	78	5	0	0	3	0	0	0	0	1879
13:00	2	1634	228	1	67	1	0	1	5	0	0	0	0	1939
14:00	3	1758	238	2	84	1	0	6	2	0	0	0	0	2094
15:00	10	1888	242	5	81	3	0	5	3	0	0	0	0	2237
16:00	9	1904	235	2	81	1	0	6	2	0	0	0	0	2240
17:00	8	1996	235	3	72	0	0	5	2	0	0	0	0	2321
18:00	6	1717	196	1	64	0	0	5	2	0	0	0	0	1991
19:00	6	1408	153	0	40	0	0	0	3	0	0	0	0	1610
20:00	3	1048	124	0	42	0	0	2	2	0	1	0	0	1222
21:00	0	835	78	0	39	0	0	2	0	0	1	0	0	955
22:00	1	488	50	0	14	0	0	0	1	0	0	0	0	554
23:00	0	321	28	0	7	0	0	0	1	0	0	0	0	357
Totals	74	26796	3479	44	1188	23		43	95		4			31746
% of Totals	0%	84%	11%	0%	4%	0%		0%	0%		0%			100%

AM Volumes	23	10201	1483	27	519	12	0	11	69	0	2	0	0	12347
% AM	0%	32%	5%	0%	2%	0%		0%	0%		0%			39%
AM Peak Hour	10:00	07:00	07:00	09:00	09:00	10:00		08:00	06:00		04:00			07:00
Volume	4	1712	238	6	90	4		5	13		1			2038
PM Volumes	51	16595	1996	17	669	11	0	32	26	0	2	0	0	19399
% PM	0%	52%	6%	0%	2%	0%		0%	0%		0%			61%
PM Peak Hour	15:00	17:00	15:00	15:00	14:00	12:00		14:00	13:00		20:00			17:00
Volume	10	1996	242	5	84	5		6	5		1			2321

Directional Peak Periods	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
All Classes	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%
	3904		12%	3818		12%	4561		14%	19463		61%

Classification Definitions

1 Motorcycles
2 Passenger Cars
3 2-Axle, 4-Tire Single Units
4 Buses
5 2-Axle, 6-Tire Single Units
6 3-Axle Single Units
7 > =4-Axle Single Units
8 <=4-Axle Single Trailers
9 5-Axle Single Trailers
10 >=6-Axle Single Trailers
11 <=5-Axle Multi-Trailers
12 6-Axle Multi-Trailers
13 >=7-Axle Multi-Trailers

Prepared by National Data & Surveying Services

SPEED

College Blvd Bet. Thunder Dr & Marvin St

Day: Thursday
Date: 9/13/2018

City: Oceanside
Project #: CA18_4320_006

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	1	3	2	10	13	46	75	29	13	3	0	0	**195**
01:00	0	0	2	1	3	13	33	36	15	6	1	0	0	**110**
02:00	0	0	2	0	7	12	28	51	24	5	3	1	0	**133**
03:00	2	0	0	0	13	14	24	42	41	11	3	0	0	**150**
04:00	0	0	0	0	7	29	65	111	73	37	3	0	0	**325**
05:00	0	0	1	1	9	64	195	301	171	45	9	1	0	**797**
06:00	3	6	2	19	72	208	559	547	169	18	1	0	0	**1604**
07:00	2	1	8	12	99	352	821	586	144	11	2	0	0	**2038**
08:00	0	1	6	17	72	387	740	490	140	9	3	1	0	**1866**
09:00	0	2	5	14	71	283	657	478	158	23	4	1	0	**1696**
10:00	1	0	3	12	84	219	665	497	128	24	3	1	0	**1637**
11:00	2	2	5	23	100	309	714	497	117	26	0	1	0	**1796**
12:00 PM	0	0	0	12	102	322	674	588	164	16	1	0	0	**1879**
13:00	0	0	1	19	62	337	777	586	141	15	1	0	0	**1939**
14:00	0	0	2	34	107	369	754	617	180	28	3	0	0	**2094**
15:00	0	3	14	31	123	483	822	573	160	26	2	0	0	**2237**
16:00	0	2	3	23	128	394	865	607	188	29	1	0	0	**2240**
17:00	3	6	13	47	179	514	861	503	168	26	0	1	0	**2321**
18:00	0	1	2	25	129	450	761	477	132	14	0	0	0	**1991**
19:00	0	0	3	30	131	416	648	296	69	16	1	0	0	**1610**
20:00	0	0	6	11	60	206	485	349	85	19	1	0	0	**1222**
21:00	0	1	0	7	48	159	369	291	68	11	1	0	0	**955**
22:00	0	2	3	6	29	48	166	187	98	15	0	0	0	**554**
23:00	0	0	1	3	18	40	97	117	65	14	2	0	0	**357**
Totals	**13**	**28**	**85**	**349**	**1663**	**5641**	**11826**	**8902**	**2727**	**457**	**48**	**7**		**31746**
% of Totals	0%	0%	0%	1%	5%	18%	37%	28%	9%	1%	0%	0%		100%

AM Volumes	10	13	37	101	547	1903	4547	3711	1209	228	35	6	0	12347
% AM	0%	0%	0%	0%	2%	6%	14%	12%	4%	1%	0%	0%		39%
AM Peak Hour	06:00	06:00	07:00	11:00	11:00	08:00	07:00	07:00	05:00	05:00	05:00	02:00		07:00
Volume	3	6	8	23	100	387	821	586	171	45	9	1		2038
PM Volumes	3	15	48	248	1116	3738	7279	5191	1518	229	13	1	0	19399
% PM	0%	0%	0%	1%	4%	12%	23%	16%	5%	1%	0%	0%		61%
PM Peak Hour	17:00	17:00	15:00	17:00	17:00	17:00	16:00	14:00	16:00	16:00	14:00	17:00		17:00
Volume	3	6	14	47	179	514	865	617	188	29	3	1		2321

Directional Peak Periods	**AM 7-9**			**NOON 12-2**			**PM 4-6**			**Off Peak Volumes**		
All Speeds	Volume	↔	%	Volume	↔	%	Volume	↔	%	Volume	↔	%
	3904		12%	3818		12%	4561		14%	19463		61%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
College Blvd	Summary	37	43	43	49	53	31746

Prepared by National Data & Surveying Services

CLASSIFICATION

College Blvd Bet. Roselle Ave & Barnard Dr/Waring Rd

Day: Thursday
Date: 9/13/2018

City: Oceanside
Project #: CA18_4320_007

Summary

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	172	22	1	10	1	0	0	1	0	0	0	0	207
01:00	0	105	12	1	3	0	0	0	0	0	0	0	0	121
02:00	0	87	12	0	4	0	0	0	0	0	0	0	0	103
03:00	0	152	24	0	10	0	0	0	0	0	0	0	0	186
04:00	0	274	32	2	19	0	0	1	2	0	0	0	0	330
05:00	5	709	92	1	37	0	0	0	5	0	0	0	0	849
06:00	5	1375	200	1	64	1	0	3	5	0	1	0	0	1655
07:00	9	1628	197	4	66	2	0	5	1	0	0	0	0	1912
08:00	7	1597	191	3	84	0	0	8	5	0	0	0	0	1895
09:00	1	1476	192	5	79	2	0	5	5	0	0	0	0	1765
10:00	5	1394	182	4	76	7	0	0	5	0	0	0	0	1673
11:00	6	1520	204	6	80	5	0	0	6	0	1	0	0	1828
12:00 PM	6	1667	182	3	74	4	0	1	5	0	0	0	0	1942
13:00	4	1723	204	5	79	1	0	1	3	0	0	0	0	2020
14:00	5	1780	217	4	79	0	0	6	2	0	0	0	0	2093
15:00	4	1988	249	6	76	4	0	4	2	0	0	0	0	2333
16:00	7	2018	230	4	73	1	0	8	2	0	0	0	0	2343
17:00	8	2088	227	3	77	0	0	3	4	0	0	0	0	2410
18:00	5	1810	198	1	79	0	0	5	1	0	0	0	0	2099
19:00	2	1453	158	0	62	0	0	2	2	0	1	0	0	1680
20:00	2	1124	123	0	51	0	0	2	2	0	1	0	0	1305
21:00	0	928	88	0	21	0	0	2	1	0	0	0	0	1040
22:00	0	536	38	0	13	0	0	0	1	0	0	0	0	588
23:00	0	360	32	0	8	0	0	0	1	0	0	0	0	401
Totals	81	27964	3306	54	1224	28		56	61		4			32778
% of Totals	0%	85%	10%	0%	4%	0%		0%	0%		0%			100%

AM Volumes	38	10489	1360	28	532	18	0	22	35	0	2	0	0	12524
% AM	0%	32%	4%	0%	2%	0%		0%	0%		0%			38%
AM Peak Hour	07:00	07:00	11:00	11:00	08:00	10:00		08:00	11:00		06:00			07:00
Volume	9	1628	204	6	84	7		8	6		1			1912
PM Volumes	43	17475	1946	26	692	10	0	34	26	0	2	0	0	20254
% PM	0%	53%	6%	0%	2%	0%		0%	0%		0%			62%
PM Peak Hour	17:00	17:00	15:00	15:00	13:00	12:00		16:00	12:00		19:00			17:00
Volume	8	2088	249	6	79	4		8	5		1			2410

Directional Peak Periods	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
All Classes	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%
	3807		12%	3962		12%	4753		15%	20256		62%

Classification Definitions

1 Motorcycles
2 Passenger Cars
3 2-Axle, 4-Tire Single Units
4 Buses
5 2-Axle, 6-Tire Single Units
6 3-Axle Single Units
7 > =4-Axle Single Units
8 <=4-Axle Single Trailers
9 5-Axle Single Trailers
10 >=6-Axle Single Trailers
11 <=5-Axle Multi-Trailers
12 6-Axle Multi-Trailers
13 >=7-Axle Multi-Trailers

SPEED

College Blvd Bet. Roselle Ave & Barnard Dr/Waring Rd

Day: Thursday
Date: 9/13/2018

City: Oceanside
Project #: CA18_4320_007

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	0	3	2	14	21	63	75	26	2	1	0	207
01:00	0	0	0	0	1	5	10	53	39	9	3	1	0	121
02:00	0	0	2	0	1	8	14	24	38	13	3	0	0	103
03:00	0	0	0	0	1	6	21	64	58	30	6	0	0	186
04:00	0	0	0	0	3	19	46	95	111	45	10	1	0	330
05:00	0	0	0	2	6	19	126	291	283	97	22	2	1	849
06:00	3	1	10	15	63	155	365	602	336	99	5	1	0	1655
07:00	20	20	38	99	152	245	456	477	309	81	15	0	0	1912
08:00	7	6	8	44	134	228	463	560	346	86	11	2	0	1895
09:00	0	0	1	3	31	148	394	633	409	126	19	1	0	1765
10:00	0	1	0	3	20	102	354	630	417	128	16	2	0	1673
11:00	0	0	0	2	16	111	413	709	430	133	13	1	0	1828
12:00 PM	4	4	4	7	29	140	423	677	481	150	18	5	0	1942
13:00	1	1	2	9	37	146	435	733	482	157	13	4	0	2020
14:00	0	0	1	8	32	137	487	744	530	142	10	2	0	2093
15:00	0	0	2	5	30	173	548	830	585	134	21	3	2	2333
16:00	0	2	1	2	59	205	603	837	498	129	7	0	0	2343
17:00	0	0	3	8	77	279	659	841	415	110	17	0	1	2410
18:00	0	0	13	29	74	245	526	714	379	103	13	3	0	2099
19:00	0	0	0	2	53	154	444	546	358	100	21	2	0	1680
20:00	0	0	0	6	11	79	320	539	272	69	5	4	0	1305
21:00	0	0	0	0	2	42	201	400	315	63	17	0	0	1040
22:00	0	0	0	1	3	14	101	193	173	85	16	2	0	588
23:00	0	0	0	1	3	24	58	130	127	47	8	2	1	401
Totals	35	35	85	249	840	2698	7488	11385	7466	2162	291	39	5	32778
% of Totals	0%	0%	0%	1%	3%	8%	23%	35%	23%	7%	1%	0%	0%	100%

AM Volumes	30	28	59	171	430	1060	2683	4201	2851	873	125	12	1	12524
% AM	0%	0%	0%	1%	1%	3%	8%	13%	9%	3%	0%	0%	0%	38%
AM Peak Hour	07:00	07:00	07:00	07:00	07:00	07:00	08:00	11:00	11:00	11:00	05:00	05:00	05:00	07:00
Volume	20	20	38	99	152	245	463	709	430	133	22	2	1	1912
PM Volumes	5	7	26	78	410	1638	4805	7184	4615	1289	166	27	4	20254
% PM	0%	0%	0%	0%	1%	5%	15%	22%	14%	4%	1%	0%	0%	62%
PM Peak Hour	12:00	12:00	18:00	18:00	17:00	17:00	17:00	17:00	15:00	13:00	15:00	12:00	15:00	17:00
Volume	4	4	13	29	77	279	659	841	585	157	21	5	2	2410

Directional Peak Periods All Speeds	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%
	3807 ⟷	12%	3962 ⟷	12%	4753 ⟷	15%	20256 ⟷	62%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
College Blvd	Summary	41	47	47	53	57	32778

Prepared by National Data & Surveying Services

CLASSIFICATION

College Blvd Bet. Barnard Dr/Waring Rd & Vista Way

Day: Thursday
Date: 9/13/2018

City: Oceanside
Project #: CA18_4320_008

Summary

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	175	18	0	12	1	0	1	0	0	0	0	0	207
01:00	0	100	13	0	5	0	0	1	0	0	0	0	0	119
02:00	0	112	13	0	1	0	0	0	0	0	0	0	0	126
03:00	1	193	21	0	5	0	0	0	1	0	0	0	0	221
04:00	0	311	30	0	21	0	0	1	0	0	0	0	0	363
05:00	1	847	107	1	52	2	0	0	0	0	0	0	0	1010
06:00	6	1654	190	1	126	5	0	0	2	0	0	0	0	1984
07:00	5	2133	253	3	142	6	0	0	5	0	0	0	0	2547
08:00	6	2237	297	4	179	7	0	2	5	0	0	0	0	2737
09:00	3	2039	249	3	148	7	0	3	4	0	0	0	0	2456
10:00	6	2045	260	4	163	2	0	1	5	0	0	0	0	2486
11:00	3	2165	264	4	160	8	0	2	9	0	0	0	0	2615
12:00 PM	9	2274	281	2	176	4	0	2	6	0	0	0	0	2754
13:00	3	2355	296	2	161	4	0	4	6	0	0	0	0	2831
14:00	6	2362	285	6	164	4	0	6	7	0	0	0	0	2840
15:00	4	2650	339	5	181	5	0	4	6	0	0	0	0	3194
16:00	8	2685	344	1	183	2	0	4	4	0	0	0	0	3231
17:00	5	2722	329	4	185	4	0	4	6	0	0	0	0	3259
18:00	4	2302	279	4	151	3	0	4	4	0	0	0	0	2751
19:00	4	1737	216	3	116	3	0	1	4	0	0	0	0	2084
20:00	3	1460	170	0	98	1	0	0	0	0	0	0	0	1732
21:00	2	1200	148	1	78	0	0	0	0	0	0	0	0	1429
22:00	2	651	72	0	38	0	0	0	0	0	0	0	0	763
23:00	0	398	55	0	23	0	0	0	1	0	0	0	0	477
Totals	81	36807	4529	48	2568	68		40	75					44216
% of Totals	0%	83%	10%	0%	6%	0%		0%	0%					100%

AM Volumes	31	14011	1715	20	1014	38	0	11	31	0	0	0	0	16871
% AM	0%	32%	4%	0%	2%	0%		0%	0%					38%
AM Peak Hour	06:00	08:00	08:00	08:00	08:00	11:00		09:00	11:00					08:00
Volume	6	2237	297	4	179	8		3	9					2737
PM Volumes	50	22796	2814	28	1554	30	0	29	44	0	0	0	0	27345
% PM	0%	52%	6%	0%	4%	0%		0%	0%					62%
PM Peak Hour	12:00	17:00	16:00	14:00	17:00	15:00		14:00	14:00					17:00
Volume	9	2722	344	6	185	5		6	7					3259

Directional Peak Periods	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
All Classes	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%
	5284		12%	5585		13%	6490		15%	26857		61%

Classification Definitions

1 Motorcycles
2 Passenger Cars
3 2-Axle, 4-Tire Single Units
4 Buses
5 2-Axle, 6-Tire Single Units
6 3-Axle Single Units
7 > =4-Axle Single Units
8 <=4-Axle Single Trailers
9 5-Axle Single Trailers
10 >=6-Axle Single Trailers
11 <=5-Axle Multi-Trailers
12 6-Axle Multi-Trailers
13 >=7-Axle Multi-Trailers

Prepared by National Data & Surveying Services

SPEED

College Blvd Bet. Barnard Dr/Waring Rd & Vista Way

Day: Thursday
Date: 9/13/2018

City: Oceanside
Project #: CA18_4320_008

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	2	3	11	31	69	39	39	9	2	2	0	0	0	**207**
01:00	0	0	8	18	28	31	26	4	4	0	0	0	0	**119**
02:00	3	4	6	28	30	23	18	9	5	0	0	0	0	**126**
03:00	2	3	11	42	53	38	34	29	5	4	0	0	0	**221**
04:00	10	13	18	42	78	85	69	30	15	2	1	0	0	**363**
05:00	27	44	60	149	271	232	151	57	15	3	0	1	0	**1010**
06:00	80	130	237	419	554	363	146	46	6	2	0	1	0	**1984**
07:00	169	224	368	623	646	329	128	50	10	0	0	0	0	**2547**
08:00	133	224	382	701	721	387	140	39	10	0	0	0	0	**2737**
09:00	107	149	276	598	691	433	160	35	7	0	0	0	0	**2456**
10:00	89	146	271	642	688	391	166	73	18	1	1	0	0	**2486**
11:00	99	167	304	693	708	403	181	56	4	0	0	0	0	**2615**
12:00 PM	121	182	332	667	785	422	173	65	6	1	0	0	0	**2754**
13:00	134	182	317	741	780	434	170	60	12	0	1	0	0	**2831**
14:00	91	155	294	726	834	475	194	67	3	1	0	0	0	**2840**
15:00	150	200	375	827	884	493	185	63	15	2	0	0	0	**3194**
16:00	120	209	391	884	886	482	187	48	23	1	0	0	0	**3231**
17:00	147	238	447	908	864	444	153	48	9	0	1	0	0	**3259**
18:00	70	135	247	696	842	491	210	47	11	2	0	0	0	**2751**
19:00	28	53	139	481	660	464	196	55	8	0	0	0	0	**2084**
20:00	24	52	134	470	553	345	128	18	8	0	0	0	0	**1732**
21:00	33	37	99	313	506	283	127	27	4	0	0	0	0	**1429**
22:00	14	12	36	162	215	172	105	34	12	0	1	0	0	**763**
23:00	9	11	26	121	112	107	63	19	4	3	2	0	0	**477**
Totals	**1662**	**2573**	**4789**	**10982**	**12458**	**7366**	**3149**	**988**	**216**	**24**	**7**	**2**		**44216**
% of Totals	4%	6%	11%	25%	28%	17%	7%	2%	0%	0%	0%	0%		100%

AM Volumes	721	1107	1952	3986	4537	2754	1258	437	101	14	2	2	0	16871
% AM	2%	3%	4%	9%	10%	6%	3%	1%	0%	0%	0%	0%		38%
AM Peak Hour	07:00	07:00	08:00	08:00	08:00	09:00	11:00	10:00	10:00	03:00	04:00	05:00		08:00
Volume	169	224	382	701	721	433	181	73	18	4	1	1		2737
PM Volumes	941	1466	2837	6996	7921	4612	1891	551	115	10	5	0	0	27345
% PM	2%	3%	6%	16%	18%	10%	4%	1%	0%	0%	0%			62%
PM Peak Hour	15:00	17:00	17:00	17:00	16:00	15:00	18:00	14:00	16:00	23:00	23:00			17:00
Volume	150	238	447	908	886	493	210	67	23	3	2			3259

Directional Peak Periods	**AM 7-9**			**NOON 12-2**			**PM 4-6**			**Off Peak Volumes**		
All Speeds	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%
	5284		12%	5585		13%	6490		15%	26857		61%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
College Blvd	Summary	23	31	30	38	43	44216

Prepared by National Data & Surveying Services

College Blvd & Old Grove Rd

Peak Hour Turning Movement Count

ID: 18-04321-001
City: Oceanside

Day: Thursday
Date: 09/13/2018

PEAK HOURS

AM	07:15 AM - 08:15 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

College Blvd — SOUTHBOUND

AM	169	1085	32	1	916	AM
NOON	0	0	0	0	0	NOON
PM	60	739	39	0	1409	PM

Old Grove Rd — EASTBOUND

AM	NOON	PM		
540	0	467	⇦	
0	0	0	↶	0
36	0	135	↰	1
69	0	123	→	1
192	0	282	↱	1
AM	NOON	PM		

Old Grove Rd — WESTBOUND

PM	NOON	AM		
35	0	50	↰	1
80	0	130	←	1
77	0	130	↶	1
0	0	0	↷	0
295	0	145	⇨	
PM	NOON	AM		

CONTROL: Signalized

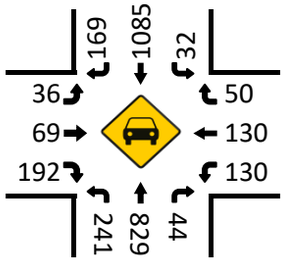
TEV	3008 AM	0 NOON	3269 PM
PHF	0.93		0.96

College Blvd — NORTHBOUND

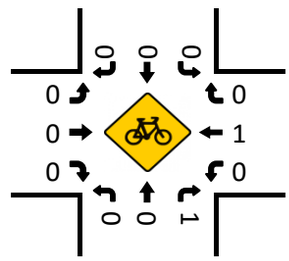
PM	1098	0	327	1239	133	PM
NOON	0	0	0	0	0	NOON
AM	1407	0	241	829	44	AM

Turning movements at the intersection: 0 | 2 | 1 | 0 (eastbound); 0 | 2 | 2 | 0 (northbound); 1 | 1 | 1 | 0 (westbound)

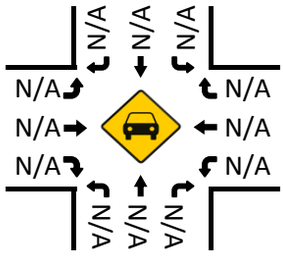
Total Vehicles (AM)



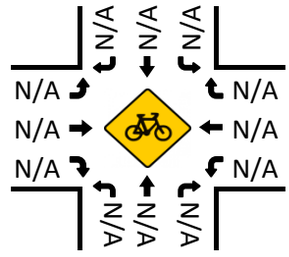
Bikes (AM)



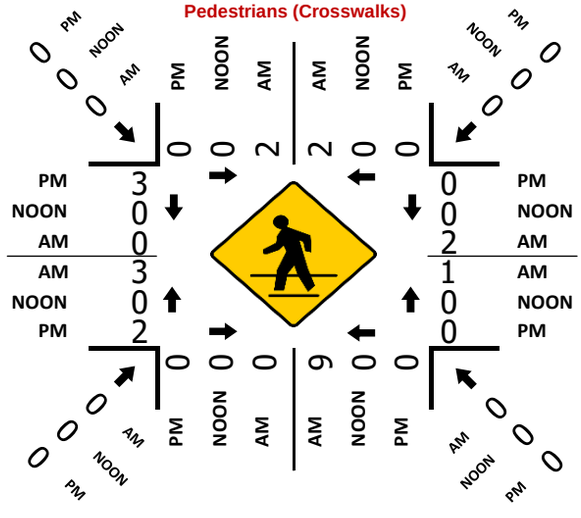
Total Vehicles (Noon)



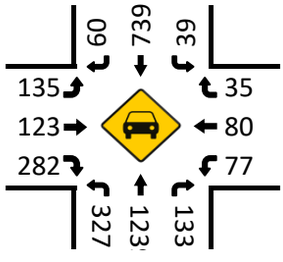
Bikes (NOON)



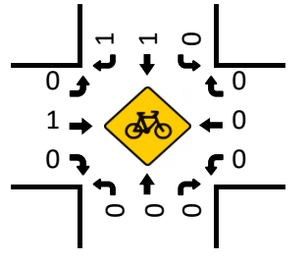
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

College Blvd & Avenida De La Plata

Peak Hour Turning Movement Count

ID: 18-04321-002
City: Oceanside

Day: Thursday
Date: 09/13/2018

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

College Blvd — SOUTHBOUND

AM	231	1182	13	1	1104	AM
NOON	0	0	0	0	0	NOON
PM	45	1028	11	2	1690	PM

Avenida De La Plata — EASTBOUND

AM	NOON	PM		
512	0	153		
0	0	0	0	
47	0	113	1.5	
13	0	63	0.5	
58	0	130	1	
AM	NOON	PM		

Avenida De La Plata — WESTBOUND

PM	NOON	AM		
5	0	10	0	
22	0	73	1	
61	0	77	1	
0	0	0	0	
PM	NOON	AM		

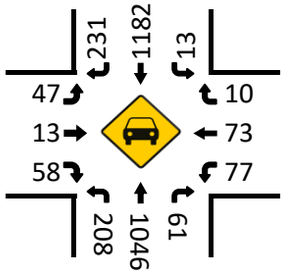
College Blvd — NORTHBOUND

PM	1252	33	86	1570	144	PM
NOON	0	0	0	0	0	NOON
AM	1331	14	208	1046	61	AM

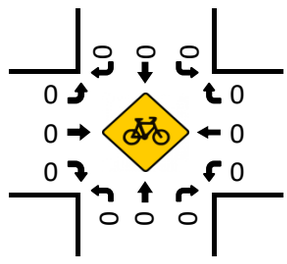
CONTROL: Signalized

TEV	3034	0	3313
	AM	NOON	PM
PHF	0.95		0.96

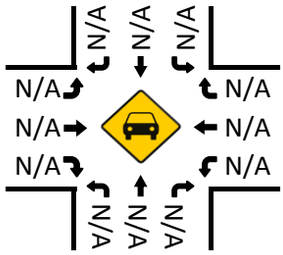
Total Vehicles (AM)



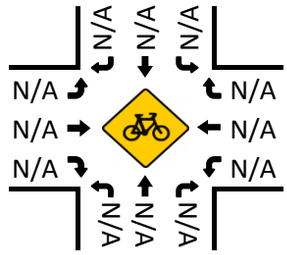
Bikes (AM)



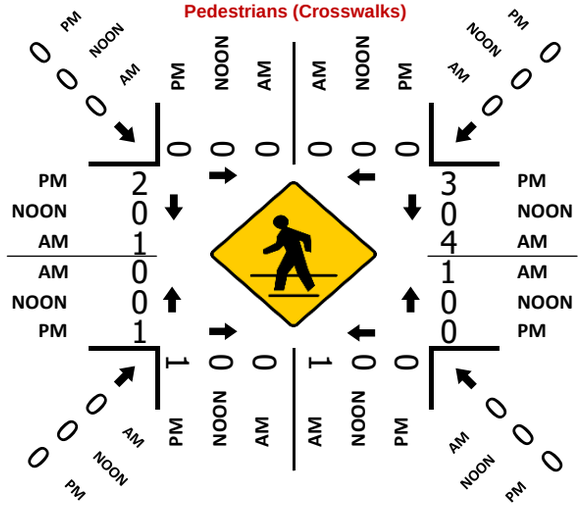
Total Vehicles (Noon)



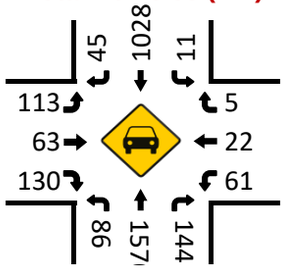
Bikes (NOON)



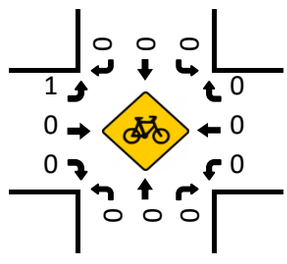
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

College Blvd & Aztec St

Peak Hour Turning Movement Count

ID: 18-04321-003
City: Oceanside

Day: Thursday
Date: 09/13/2018

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

College Blvd — SOUTHBOUND

AM	5	1345	21	0	1253	AM
NOON	0	0	0	0	0	NOON
PM	11	1213	24	1	1814	PM

Aztec St — EASTBOUND

AM	NOON	PM	
17	0	38	
0	0	0	0
0	0	0	0
0	0	0	1
27	0	25	0
AM	NOON	PM	

CONTROL

1-Way Stop (EB)

TEV	2681	0	3144
	AM	NOON	PM
PHF	0.98		0.94

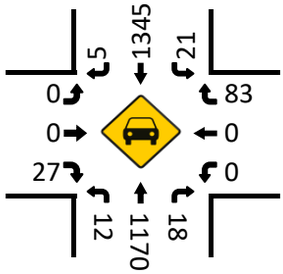
Aztec St — WESTBOUND

PM	NOON	AM	
63	0	83	0
0	0	0	1
0	0	0	0
0	0	0	0
54	0	39	
PM	NOON	AM	

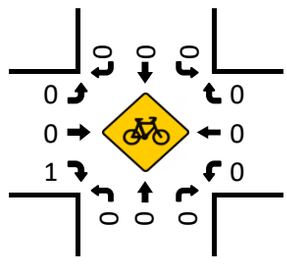
College Blvd — NORTHBOUND

PM	1238	0	27	1750	30	PM
NOON	0	0	0	0	0	NOON
AM	1372	0	12	1170	18	AM

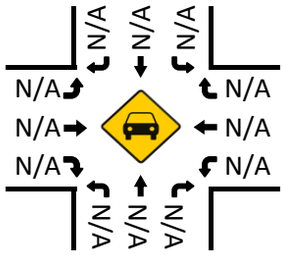
Total Vehicles (AM)



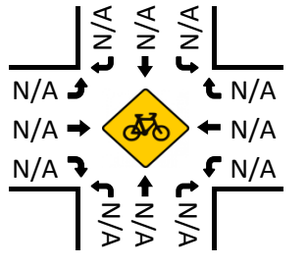
Bikes (AM)



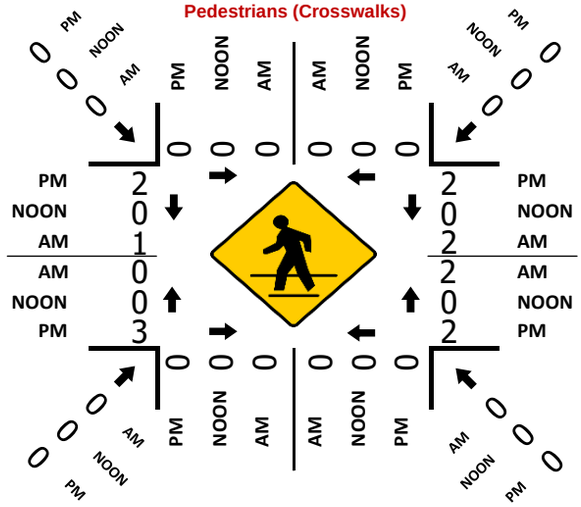
Total Vehicles (Noon)



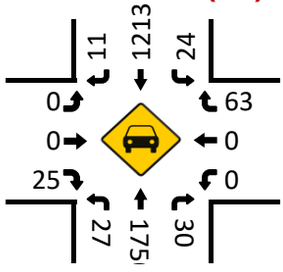
Bikes (NOON)



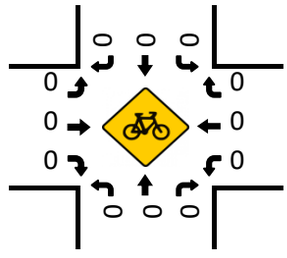
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

College Blvd & Oceanside Blvd

Peak Hour Turning Movement Count

ID: 18-04321-004
City: Oceanside

Day: Thursday
Date: 09/13/2018

PEAK HOURS

AM: 07:15 AM - 08:15 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

College Blvd — SOUTHBOUND

AM	74	1073	94	9	1278	AM
NOON	0	0	0	0	0	NOON
PM	111	853	252	35	1822	PM

Oceanside Blvd — EASTBOUND

AM	NOON	PM		
1323	0	1075	⇦	
4	0	8	↶	0
117	0	246	↱	2
383	0	801	→	3
471	0	582	↴	1
AM	NOON	PM		

Oceanside Blvd — WESTBOUND

PM	NOON	AM		
261	0	167	↰	1
571	0	693	←	2
264	0	371	↰	2
16	0	4	↶	0
1302	0	670	⇨	
PM	NOON	AM		

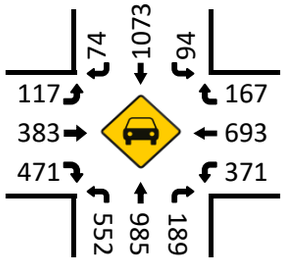
College Blvd — NORTHBOUND

PM	1699	0	385	1280	233	PM
NOON	0	0	0	0	0	NOON
AM	1915	0	552	985	189	AM

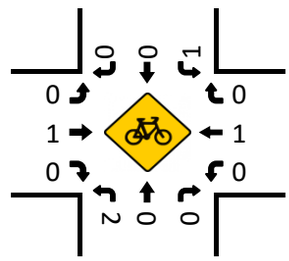
↶	↰	↑	↱	
0	2	2	1	

CONTROL			
Signalized			
TEV	5186 AM	0 NOON	5898 PM
PHF	0.93		0.97

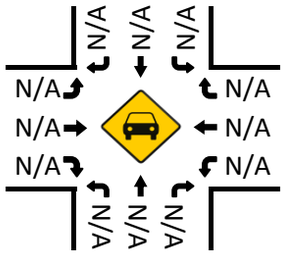
Total Vehicles (AM)



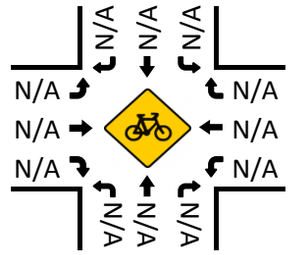
Bikes (AM)



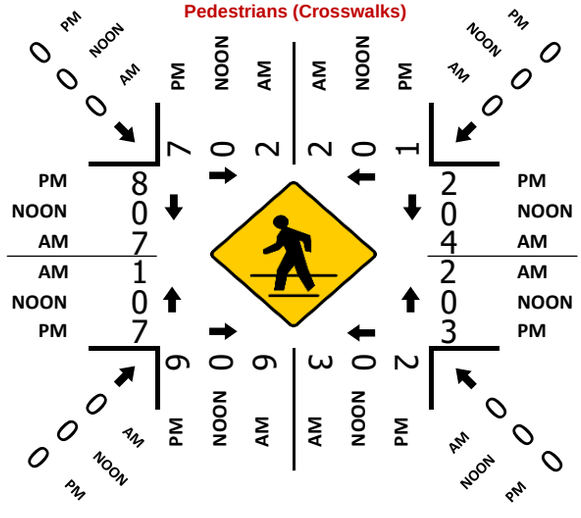
Total Vehicles (Noon)



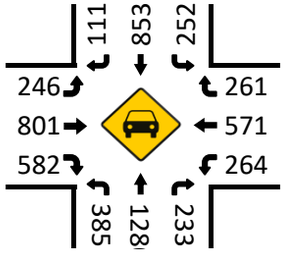
Bikes (NOON)



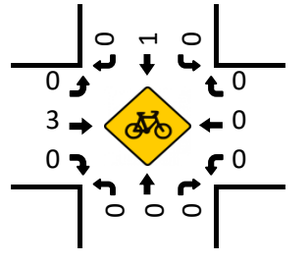
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

College Blvd & Olive Dr

Peak Hour Turning Movement Count

ID: 18-04321-005
City: Oceanside

Day: Thursday
Date: 09/13/2018

PEAK HOURS

AM: 07:15 AM - 08:15 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

College Blvd

SOUTHBOUND

AM	12	1373	651	0	1706	AM
NOON	0	0	0	0	0	NOON
PM	22	1077	764	0	1976	PM

EASTBOUND (Olive Dr)

AM	NOON	PM	
20	0	40	
0	0	0	0
11	0	12	0
4	0	10	1
18	0	4	1
AM	NOON	PM	

WESTBOUND (Olive Dr)

PM	NOON	AM	
518	0	792	2
6	0	5	0.5
68	0	147	0.5
0	0	0	0
927	0	790	
PM	NOON	AM	

CONTROL: Signalized

	AM	NOON	PM
TEV	4054	0	4092
PHF	0.93		0.96

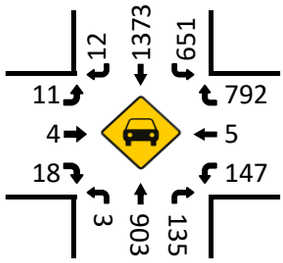
PM	1149	0	12	1446	153	PM
NOON	0	0	0	0	0	NOON
AM	1538	0	3	903	135	AM

0 2 2 0 (SB turning movements)
0 1 2 0 (NB turning movements)

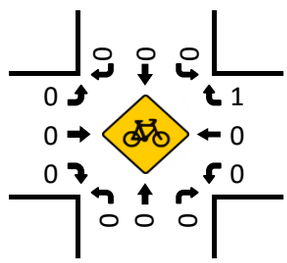
NORTHBOUND

College Blvd

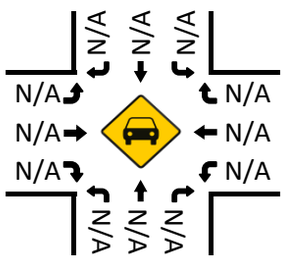
Total Vehicles (AM)



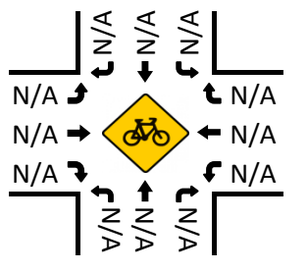
Bikes (AM)



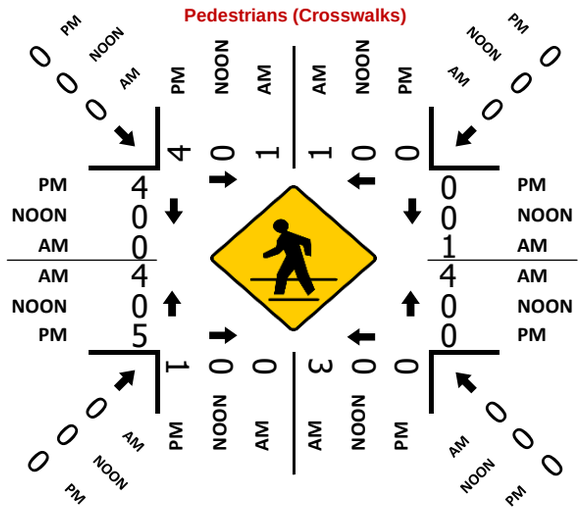
Total Vehicles (Noon)



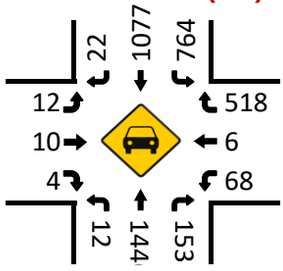
Bikes (NOON)



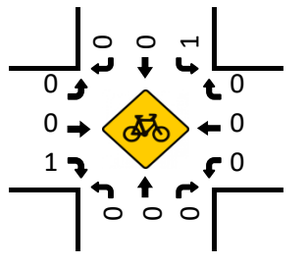
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

College Blvd & Thunder Dr

Peak Hour Turning Movement Count

ID: 18-04321-006
City: Oceanside

Day: Thursday
Date: 09/13/2018

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

SOUTHBOUND — College Blvd

AM	27	1170	358	0	1054	AM
NOON	0	0	0	0	0	NOON
PM	43	858	255	0	1667	PM

EASTBOUND — Thunder Dr

AM	NOON	PM		
38	0	111		
0	0	0	0	
24	0	28	0.5	
12	0	19	0.5	
45	0	14	1	
AM	NOON	PM		

WESTBOUND — Thunder Dr

	PM	NOON	AM
1	300	0	289
1	28	0	5
0	42	0	35
0	0	0	0
	323	0	387
	PM	NOON	AM

NORTHBOUND — College Blvd

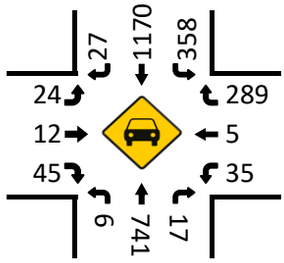
PM	920	6	40	1339	49	PM
NOON	0	0	0	0	0	NOON
AM	1252	2	6	741	17	AM

0 2 1 0 (EB turning movements)
0 1 2 0 (NB turning movements)

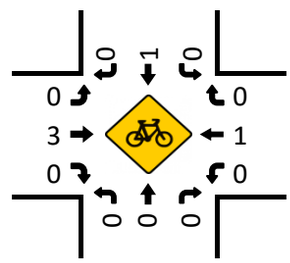
CONTROL: Signalized

TEV	2731 AM	0 NOON	3021 PM
PHF	0.92		0.94

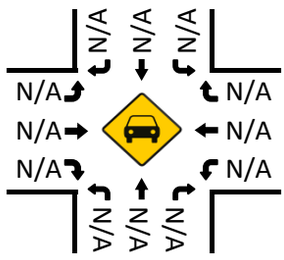
Total Vehicles (AM)



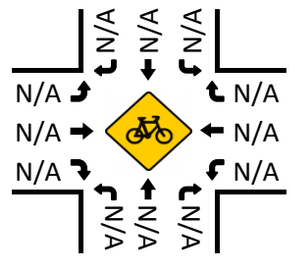
Bikes (AM)



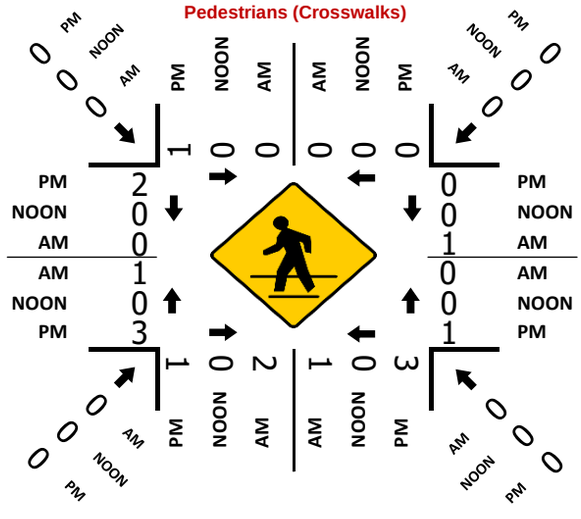
Total Vehicles (Noon)



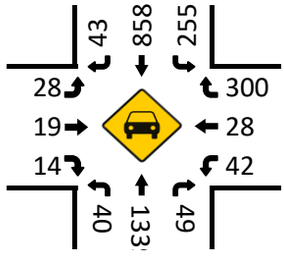
Bikes (NOON)



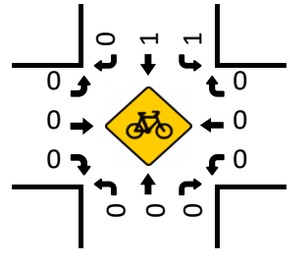
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

College Blvd & Marvin St East

Peak Hour Turning Movement Count

ID: 18-04321-007
City: Oceanside

Day: Thursday
Date: 09/13/2018

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

College Blvd — SOUTHBOUND

AM	0	1246	26	7	778	AM
NOON	0	0	0	0	0	NOON
PM	0	915	14	5	1500	PM

Marvin St East — EASTBOUND

AM	NOON	PM	
0	0	0	
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
AM	NOON	PM	

Marvin St East — WESTBOUND

PM	NOON	AM	
14	0	26	1
0	0	0	0
0	0	0	0
0	0	0	0
74	0	60	
PM	NOON	AM	

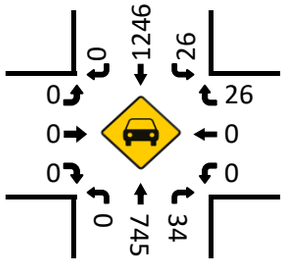
CONTROL: 1-Way Stop (WB)

TEV	2084 AM	0 NOON	2489 PM
PHF	0.95		0.93

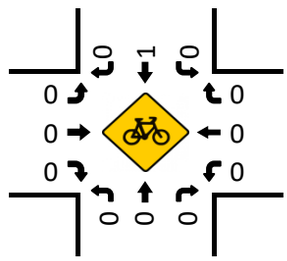
College Blvd — NORTHBOUND

PM	915	0	0	1481	60	PM
NOON	0	0	0	0	0	NOON
AM	1246	0	0	745	34	AM

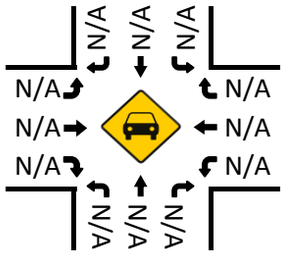
Total Vehicles (AM)



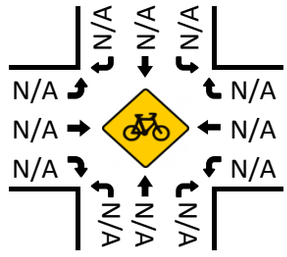
Bikes (AM)



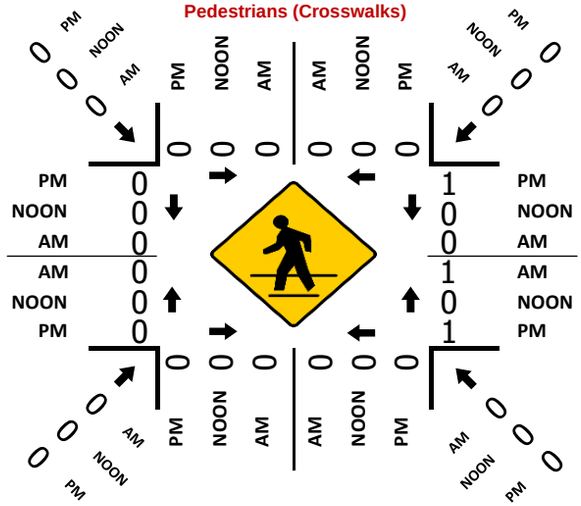
Total Vehicles (Noon)



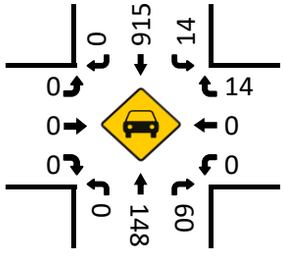
Bikes (NOON)



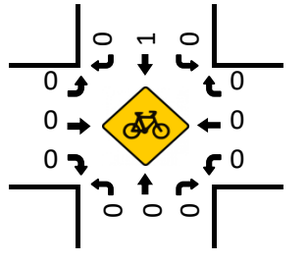
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

College Blvd & Marvin St West

Peak Hour Turning Movement Count

ID: 18-04321-008
City: Oceanside

Day: Thursday
Date: 09/13/2018

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

College Blvd — SOUTHBOUND

AM	73	1174	0	0	772	AM
NOON	0	0	0	0	0	NOON
PM	64	851	0	0	1554	PM

Marvin St West — EASTBOUND

AM	NOON	PM	
95	0	147	⇦
0	0	0	↶ 0
76	0	53	↱ 0
0	0	0	→ 1
107	0	68	↳ 0
AM	NOON	PM	

Marvin St West — WESTBOUND

PM	NOON	AM	
0	0	0	0 ↰
0	0	0	0 ←
0	0	0	0 ↰
0	0	0	0 ↰
0	0	0	⇨
PM	NOON	AM	

0 2 0 0 (EASTBOUND turning movements)

0 0 0 0 (WESTBOUND turning movements)

CONTROL: Signalized

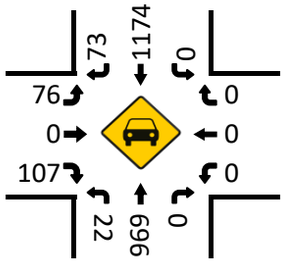
TEV	2151 AM	0 NOON	2621 PM
PHF	0.97		0.93

0 1 2 0 (NORTHBOUND turning movements)

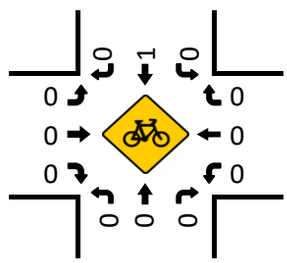
College Blvd — NORTHBOUND

PM	920	1	83	1501	0	PM
NOON	0	0	0	0	0	NOON
AM	1284	3	22	696	0	AM

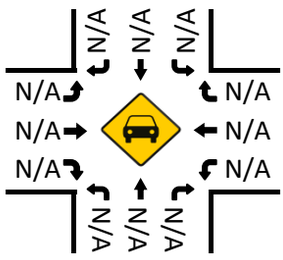
Total Vehicles (AM)



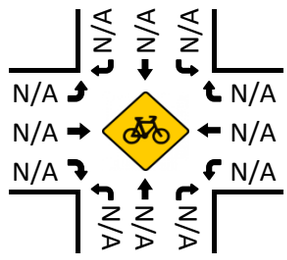
Bikes (AM)



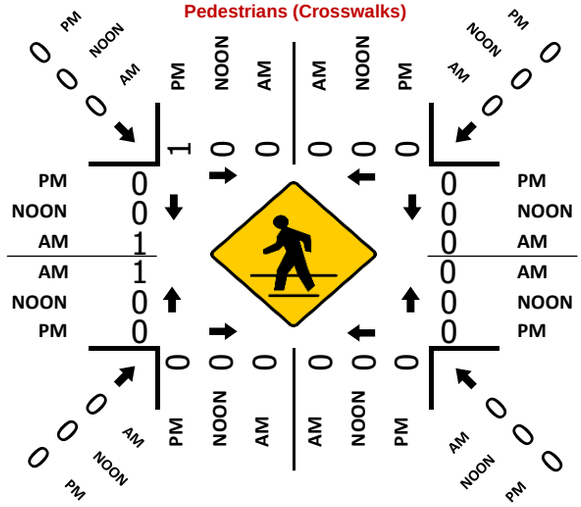
Total Vehicles (Noon)



Bikes (NOON)



Pedestrians (Crosswalks)


PM
NOON
AM
1
0
0
0
0
0
0
0
0
1
1
0
0
0
0
0
0
0
0
0
0

Prepared by National Data & Surveying Services

College Blvd & Roselle Ave

Peak Hour Turning Movement Count

ID: 18-04321-009
City: Oceanside

Day: Thursday
Date: 09/13/2018

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

SOUTHBOUND — College Blvd

AM	75	1199	24	2	724	AM
NOON	0	0	0	0	0	NOON
PM	26	855	28	4	1570	PM
	0	2	1	0		

EASTBOUND — Roselle Ave

AM	NOON	PM	
130	0	140	
0	0	0	0
18	0	15	1
17	0	11	1
58	0	41	0
AM	NOON	PM	

WESTBOUND — Roselle Ave

PM	NOON	AM	
27	0	37	0
22	0	22	1
27	0	16	1
0	0	0	0
85	0	49	
PM	NOON	AM	

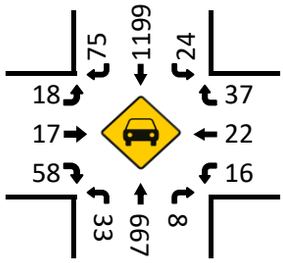
NORTHBOUND — College Blvd

PM	925	2	92	1524	46	PM
NOON	0	0	0	0	0	NOON
AM	1277	4	33	667	8	AM
		0	1	2	0	

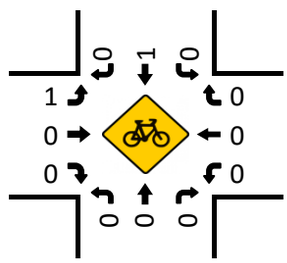
CONTROL: Signalized

TEV	2180 AM	0 NOON	2720 PM
PHF	0.94		0.91

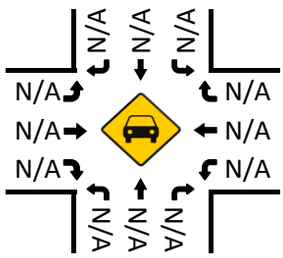
Total Vehicles (AM)



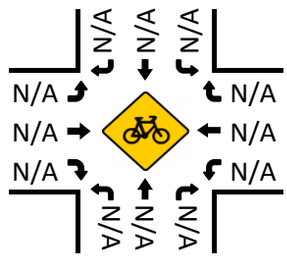
Bikes (AM)



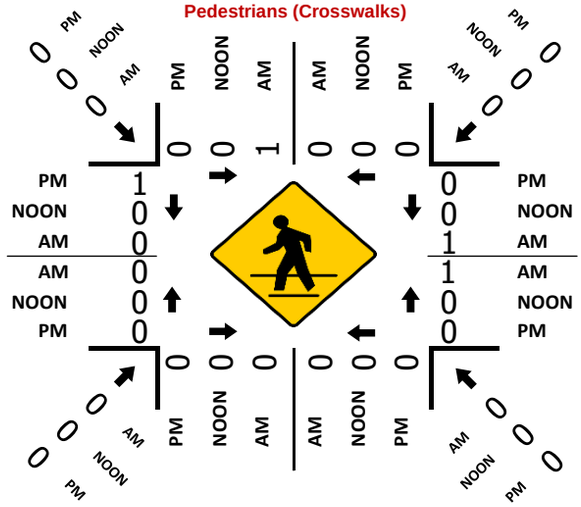
Total Vehicles (Noon)



Bikes (NOON)



Pedestrians (Crosswalks)


PM
NOON
AM
0
1
0
0
0
0
0
0
0
0

Prepared by National Data & Surveying Services

College Blvd & Barnard Dr/Waring Rd

Peak Hour Turning Movement Count

ID: 18-04321-010
City: Oceanside

Day: Thursday
Date: 09/13/2018

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

SOUTHBOUND (College Blvd)

AM	111	1043	71	2	741	AM
NOON	0	0	0	0	0	NOON
PM	86	782	39	1	1649	PM

EASTBOUND (Barnard Dr/Waring Rd)

AM	NOON	PM		
663	0	528		
0	0	0	0	
51	0	118	0.5	
37	0	40	0.5	
270	0	400	1	
AM	NOON	PM		

WESTBOUND (Barnard Dr/Waring Rd)

PM	NOON	AM		
78	0	50	0	
57	0	44	1	
109	0	118	1	
0	0	0	0	
294	0	265		
PM	NOON	AM		

NORTHBOUND (College Blvd)

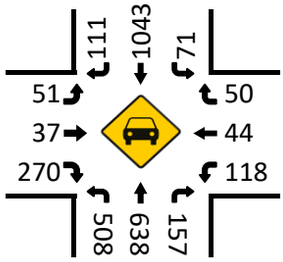
PM	1291	0	385	1452	215	PM
NOON	0	0	0	0	0	NOON
AM	1431	0	508	638	157	AM

	1	2	1	0
	0	2	2	1

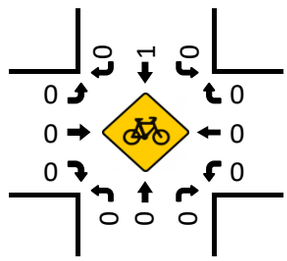
CONTROL: Signalized

TEV	3100 AM	0 NOON	3762 PM
PHF	0.86		0.96

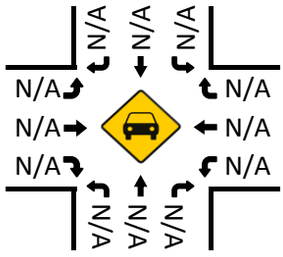
Total Vehicles (AM)



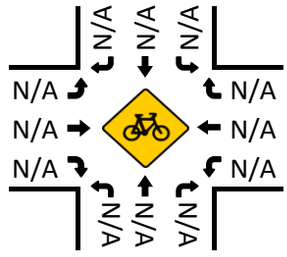
Bikes (AM)



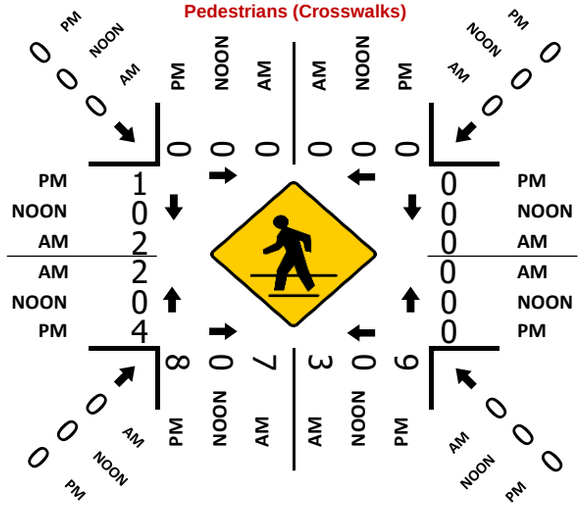
Total Vehicles (Noon)



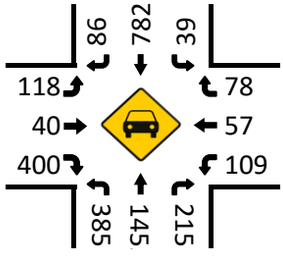
Bikes (NOON)



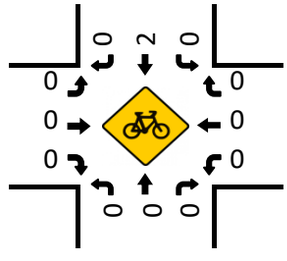
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

College Blvd & Vista Way

Peak Hour Turning Movement Count

ID: 18-04321-011
City: Oceanside

Day: Thursday
Date: 09/13/2018

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

College Blvd — SOUTHBOUND

AM	65	1354	28	0	1144	AM
NOON	0	0	0	0	0	NOON
PM	82	1172	32	0	2056	PM
	0	3	2	0		

Vista Way — EASTBOUND

AM	NOON	PM		
534	0	816		
0	0	0	0	
45	0	90	2	
158	0	184	2	
501	0	441	1	
AM	NOON	PM		

Vista Way — WESTBOUND

PM	NOON	AM	
416	0	318	0
394	0	285	2
474	0	487	2
0	0	0	0
838	0	859	
PM	NOON	AM	

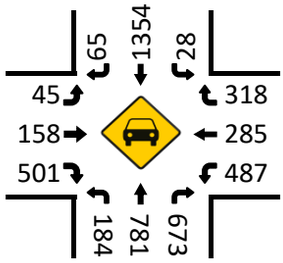
CONTROL: Signalized

TEV	4879	0	5797
	AM	NOON	PM
PHF	0.96		0.97

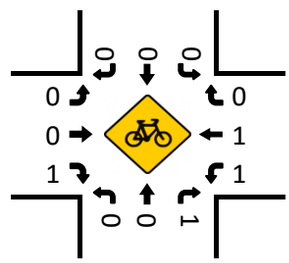
College Blvd — NORTHBOUND

	0	2	3	2	
PM	2087	0	340	1550	622	PM
NOON	0	0	0	0	0	NOON
AM	2342	0	184	781	673	AM

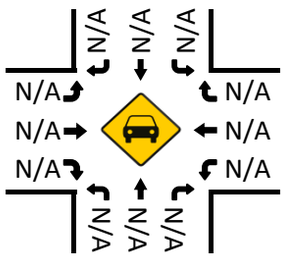
Total Vehicles (AM)



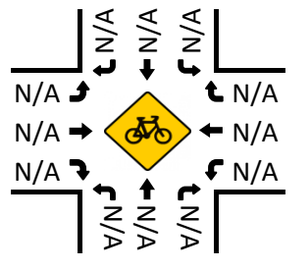
Bikes (AM)



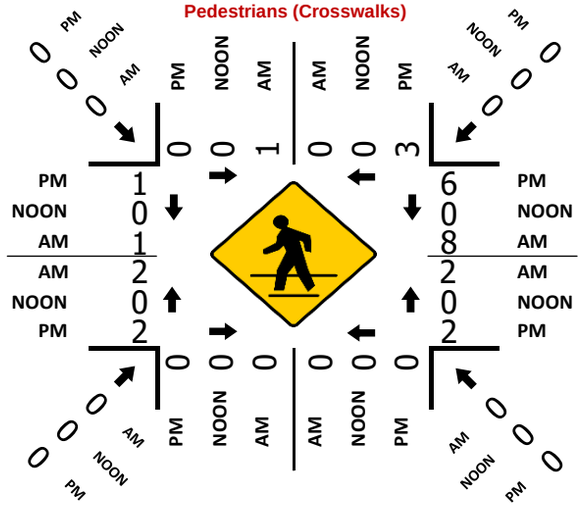
Total Vehicles (Noon)



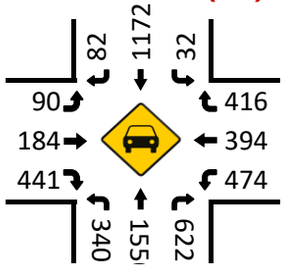
Bikes (NOON)



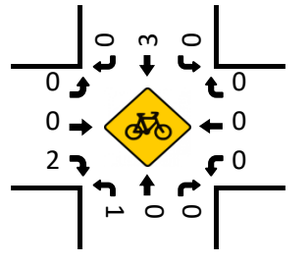
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

College Blvd & SR-78 EB off-ramp

Peak Hour Turning Movement Count

ID: 18-04321-012
City: Oceanside

Day: Thursday
Date: 09/13/2018

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

College Blvd — SOUTHBOUND

AM	0	1897	0	0	1641	AM
NOON	0	0	0	0	0	NOON
PM	0	1647	0	0	2509	PM

0 5 0 0

SR-78 EB off-ramp — EASTBOUND

AM	NOON	PM	
0	0	0	
0	0	0	0
606	0	592	2
0	0	0	0
221	0	283	1
AM	NOON	PM	

WESTBOUND — SR-78 EB off-ramp

PM	NOON	AM	
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	
PM	NOON	AM	

CONTROL

Signalized

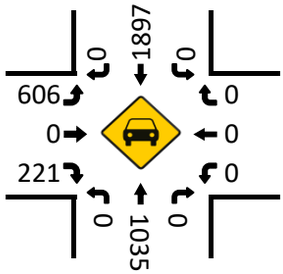
TEV	3759 AM	0 NOON	4439 PM
PHF	0.95		0.97

0 0 4 0

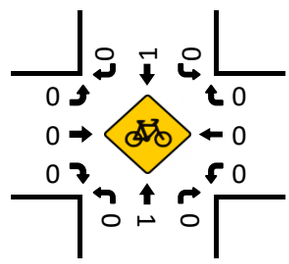
College Blvd — NORTHBOUND

PM	1930	0	0	1917	0	PM
NOON	0	0	0	0	0	NOON
AM	2118	0	0	1035	0	AM

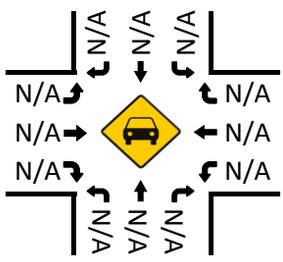
Total Vehicles (AM)



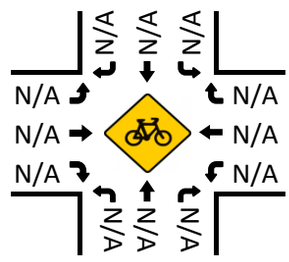
Bikes (AM)



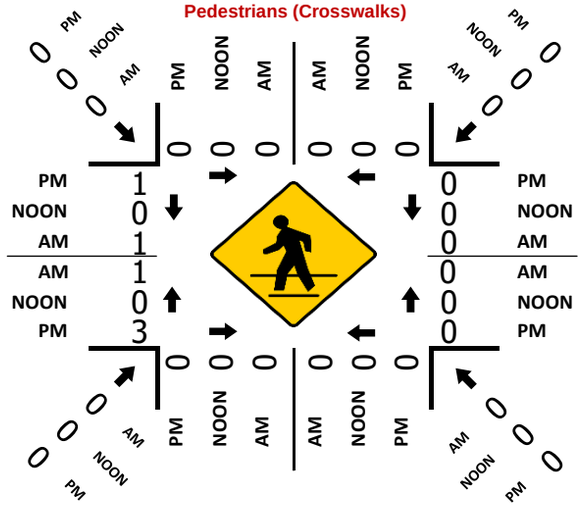
Total Vehicles (Noon)



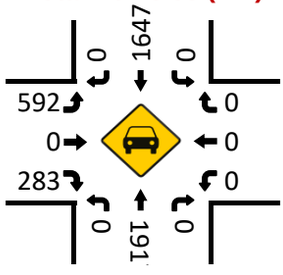
Bikes (NOON)



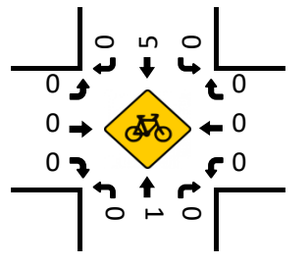
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

College Blvd & Haymar Dr/Plaza Dr

Peak Hour Turning Movement Count

ID: 18-04321-013
City: Oceanside

Day: Thursday
Date: 09/13/2018

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

College Blvd — SOUTHBOUND

AM	79	1404	628	0	1029	AM
NOON	0	0	0	0	0	NOON
PM	51	1161	693	0	1900	PM

Haymar Dr/Plaza Dr — EASTBOUND

AM	NOON	PM		
109	0	67		
0	0	0	0	
48	0	65	1	
22	0	36	0.5	
24	0	18	0.5	
AM	NOON	PM		

Haymar Dr/Plaza Dr — WESTBOUND

PM	NOON	AM		
517	0	244	1	
9	0	11	1	
168	0	123	1	
1	0	0	0	
995	0	866		
PM	NOON	AM		

CONTROL: Signalized

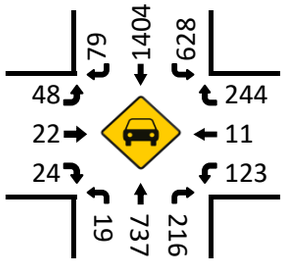
TEV	3573 AM	0 NOON	4321 PM
PHF	0.93		0.98

College Blvd — NORTHBOUND

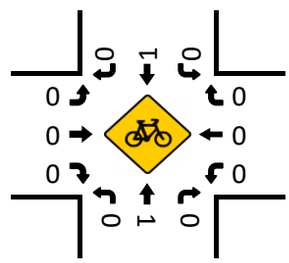
PM	1359	12	7	1318	265	PM
NOON	0	0	0	0	0	NOON
AM	1569	18	19	737	216	AM

Turning movements at intersection: 0 3 2 0 | 0 1 3 0 | 1 1 1 0

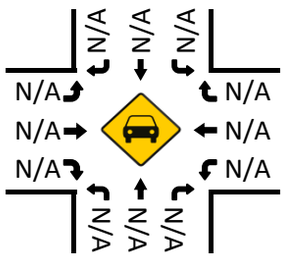
Total Vehicles (AM)



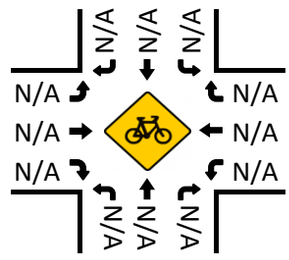
Bikes (AM)



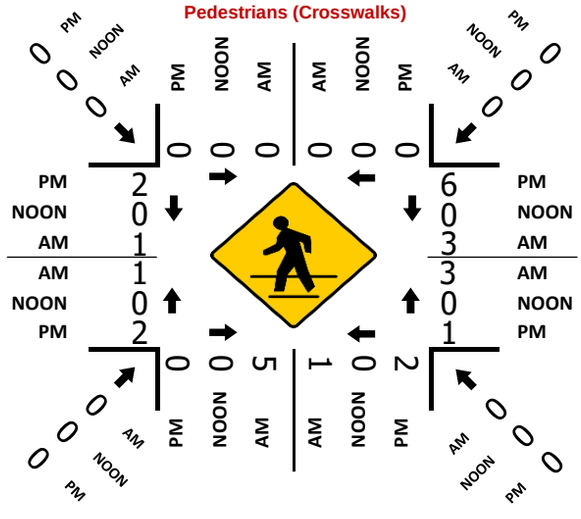
Total Vehicles (Noon)



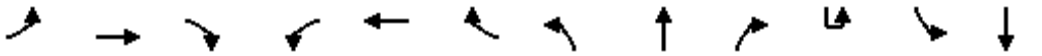
Bikes (NOON)



Pedestrians (Crosswalks)


PM
NOON
AM
0
2
0
1
1
0
2
0
0
0
0
0
0
0
0

APPENDIX B: INTERSECTION LOS WORKSHEETS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	36	69	192	130	130	50	241	829	44	1	32	1085
Future Volume (vph)	36	69	192	130	130	50	241	829	44	1	32	1085
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7			4.6	5.7
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95			1.00	0.95
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99			1.00	0.98
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	1770	1863	1572	1770	1863	1552	3433	3508			1770	3459
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	1770	1863	1572	1770	1863	1552	3433	3508			1770	3459
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	39	74	206	140	140	54	259	891	47	1	34	1167
RTOR Reduction (vph)	0	0	85	0	0	46	0	3	0	0	0	11
Lane Group Flow (vph)	39	74	121	140	140	8	259	935	0	0	35	1338
Confl. Peds. (#/hr)			6			4			3			
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA		Prot	Prot	NA
Protected Phases	7	4	5	3	8		5	2		1	1	6
Permitted Phases			4			8						
Actuated Green, G (s)	5.2	9.8	31.0	12.4	17.0	17.0	21.2	62.6			5.0	45.3
Effective Green, g (s)	5.2	9.8	31.0	12.4	17.0	17.0	21.2	62.6			5.0	45.3
Actuated g/C Ratio	0.05	0.09	0.28	0.11	0.15	0.15	0.19	0.57			0.05	0.41
Clearance Time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7			4.6	5.7
Vehicle Extension (s)	2.5	3.0	2.5	2.5	3.0	3.0	2.5	3.5			2.5	3.5
Lane Grp Cap (vph)	83	165	443	199	287	239	661	1996			80	1424
v/s Ratio Prot	0.02	0.04	0.05	c0.08	c0.08		0.08	c0.27			0.02	c0.39
v/s Ratio Perm			0.02			0.01						
v/c Ratio	0.47	0.45	0.27	0.70	0.49	0.03	0.39	0.47			0.44	0.94
Uniform Delay, d1	51.1	47.5	30.7	47.0	42.5	39.5	38.8	13.9			51.1	31.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.71	0.41			1.00	1.00
Incremental Delay, d2	3.0	1.9	0.2	10.0	1.3	0.1	0.3	0.7			2.8	13.3
Delay (s)	54.1	49.5	31.0	57.0	43.8	39.6	27.9	6.4			53.9	44.3
Level of Service	D	D	C	E	D	D	C	A			D	D
Approach Delay (s)		38.1			48.7			11.0				44.5
Approach LOS		D			D			B				D

Intersection Summary			
HCM 2000 Control Delay	31.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	169
Future Volume (vph)	169
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	182
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	3
Confl. Bikes (#/hr)	
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

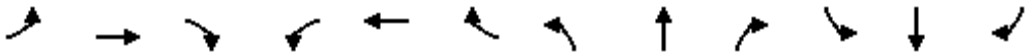
Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	47	13	58	77	73	10	14	208	1046	61	1	13
Future Volume (vph)	47	13	58	77	73	10	14	208	1046	61	1	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6			4.6	5.7	5.7		4.6
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00			1.00	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00			1.00	1.00	0.97		1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00		1.00
Frt	1.00	1.00	0.85	1.00	0.98			1.00	1.00	0.85		1.00
Flt Protected	0.95	0.97	1.00	0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (prot)	1681	1721	1562	1770	1828			1770	3539	1531		1770
Flt Permitted	0.95	0.97	1.00	0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (perm)	1681	1721	1562	1770	1828			1770	3539	1531		1770
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	49	14	61	81	77	11	15	219	1101	64	1	14
RTOR Reduction (vph)	0	0	57	0	5	0	0	0	0	24	0	0
Lane Group Flow (vph)	31	32	4	81	83	0	0	234	1101	40	0	15
Confl. Peds. (#/hr)			1							5		
Turn Type	Split	NA	Perm	Split	NA		Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	7		8	8		5	5	2		1	1
Permitted Phases			7							2		
Actuated Green, G (s)	7.5	7.5	7.5	10.4	10.4			22.6	68.9	68.9		3.7
Effective Green, g (s)	7.5	7.5	7.5	10.4	10.4			22.6	68.9	68.9		3.7
Actuated g/C Ratio	0.07	0.07	0.07	0.09	0.09			0.21	0.63	0.63		0.03
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6			4.6	5.7	5.7		4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			2.5	4.0	4.0		2.5
Lane Grp Cap (vph)	114	117	106	167	172			363	2216	958		59
v/s Ratio Prot	0.02	c0.02		c0.05	0.05			c0.13	0.31			0.01
v/s Ratio Perm			0.00							0.03		
v/c Ratio	0.27	0.27	0.04	0.49	0.48			0.64	0.50	0.04		0.25
Uniform Delay, d1	48.7	48.7	47.9	47.3	47.2			40.0	11.1	7.9		51.8
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00		0.58
Incremental Delay, d2	1.3	1.3	0.2	2.2	2.1			3.5	0.8	0.1		1.0
Delay (s)	50.0	49.9	48.0	49.5	49.3			43.5	11.9	8.0		31.2
Level of Service	D	D	D	D	D			D	B	A		C
Approach Delay (s)		49.0			49.4				17.0			
Approach LOS		D			D				B			

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1182	231
Future Volume (vph)	1182	231
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.7	5.7
Lane Util. Factor	0.95	1.00
Frpb, ped/bikes	1.00	1.00
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	3539	1583
Flt Permitted	1.00	1.00
Satd. Flow (perm)	3539	1583
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	1244	243
RTOR Reduction (vph)	0	88
Lane Group Flow (vph)	1244	155
Confl. Peds. (#/hr)		
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	50.0	50.0
Effective Green, g (s)	50.0	50.0
Actuated g/C Ratio	0.45	0.45
Clearance Time (s)	5.7	5.7
Vehicle Extension (s)	4.0	4.0
Lane Grp Cap (vph)	1608	719
v/s Ratio Prot	c0.35	
v/s Ratio Perm		0.10
v/c Ratio	0.77	0.22
Uniform Delay, d1	25.2	18.1
Progression Factor	0.33	0.08
Incremental Delay, d2	2.2	0.4
Delay (s)	10.5	2.0
Level of Service	B	A
Approach Delay (s)	9.4	
Approach LOS	A	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	27	0	0	83	12	1170	18	21	1345	5
Future Volume (Veh/h)	0	0	27	0	0	83	12	1170	18	21	1345	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	0	28	0	0	85	12	1194	18	21	1372	5
Pedestrians		1			4							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		4.0			4.0							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											917	
pX, platoon unblocked	0.70	0.70	0.70	0.70	0.70		0.70					
vC, conflicting volume	2124	2658	690	1987	2651	610	1378			1216		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1742	2508	0	1546	2499	610	671			1216		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	96	100	100	81	98			96		
cM capacity (veh/h)	30	18	755	50	19	436	637			567		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	28	85	12	796	416	21	915	462
Volume Left	0	0	12	0	0	21	0	0
Volume Right	28	85	0	0	18	0	0	5
cSH	755	436	637	1700	1700	567	1700	1700
Volume to Capacity	0.04	0.19	0.02	0.47	0.24	0.04	0.54	0.27
Queue Length 95th (ft)	3	18	1	0	0	3	0	0
Control Delay (s)	10.0	15.2	10.8	0.0	0.0	11.6	0.0	0.0
Lane LOS	A	C	B			B		
Approach Delay (s)	10.0	15.2	0.1			0.2		
Approach LOS	A	C						

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	47.3%	ICU Level of Service	A	
Analysis Period (min)	15			

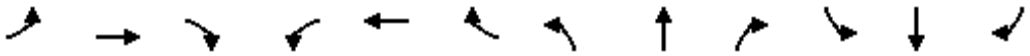
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	4	117	383	471	4	371	693	167	552	985	189	9
Future Volume (vph)	4	117	383	471	4	371	693	167	552	985	189	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	7.0	6.0		5.0	7.0	7.0	6.0	7.0	7.0	
Lane Util. Factor		0.97	0.91	1.00		0.97	0.95	1.00	0.97	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98	
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)		3433	5085	1565		3433	3539	1552	3433	3539	1546	
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)		3433	5085	1565		3433	3539	1552	3433	3539	1546	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	4	126	412	506	4	399	745	180	594	1059	203	10
RTOR Reduction (vph)	0	0	0	71	0	0	0	115	0	0	122	0
Lane Group Flow (vph)	0	130	412	435	0	403	745	65	594	1059	81	0
Confl. Peds. (#/hr)				9				4			6	
Confl. Bikes (#/hr)				1				1				
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	Perm	Prot	NA	Perm	Prot
Protected Phases	5	5	2	3	1	1	6		3	8		7
Permitted Phases				2				6			8	
Actuated Green, G (s)		11.3	20.7	50.2		22.2	31.6	31.6	29.5	54.9	54.9	
Effective Green, g (s)		11.3	20.7	50.2		22.2	31.6	31.6	29.5	54.9	54.9	
Actuated g/C Ratio		0.07	0.13	0.33		0.14	0.21	0.21	0.19	0.36	0.36	
Clearance Time (s)		5.0	7.0	6.0		5.0	7.0	7.0	6.0	7.0	7.0	
Vehicle Extension (s)		3.0	5.0	3.0		3.0	5.0	5.0	3.0	4.0	4.0	
Lane Grp Cap (vph)		251	683	510		494	726	318	657	1261	551	
v/s Ratio Prot		0.04	0.08	0.16		c0.12	c0.21		0.17	c0.30		
v/s Ratio Perm				0.11				0.04			0.05	
v/c Ratio		0.52	0.60	0.85		0.82	1.03	0.20	0.90	0.84	0.15	
Uniform Delay, d1		68.7	62.8	48.4		63.9	61.2	50.8	60.9	45.5	33.6	
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.8	2.2	12.9		10.0	40.2	0.7	15.9	5.3	0.2	
Delay (s)		70.5	65.0	61.4		73.9	101.4	51.4	76.7	50.8	33.8	
Level of Service		E	E	E		E	F	D	E	D	C	
Approach Delay (s)			63.9				86.3			57.3		
Approach LOS			E				F			E		

Intersection Summary			
HCM 2000 Control Delay	64.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	154.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	94	1073	74
Future Volume (vph)	94	1073	74
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	5.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1545
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1545
Peak-hour factor, PHF	0.93	0.93	0.93
Adj. Flow (vph)	101	1154	80
RTOR Reduction (vph)	0	0	51
Lane Group Flow (vph)	111	1154	29
Confl. Peds. (#/hr)			8
Confl. Bikes (#/hr)			
Turn Type	Prot	NA	Perm
Protected Phases	7	4	
Permitted Phases			4
Actuated Green, G (s)	32.2	56.6	56.6
Effective Green, g (s)	32.2	56.6	56.6
Actuated g/C Ratio	0.21	0.37	0.37
Clearance Time (s)	5.0	7.0	7.0
Vehicle Extension (s)	3.0	4.0	4.0
Lane Grp Cap (vph)	717	1300	567
v/s Ratio Prot	0.03	c0.33	
v/s Ratio Perm			0.02
v/c Ratio	0.15	0.89	0.05
Uniform Delay, d1	49.8	45.7	31.4
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	0.1	7.9	0.1
Delay (s)	49.9	53.6	31.5
Level of Service	D	D	C
Approach Delay (s)		52.0	
Approach LOS		D	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	4	18	147	5	792	3	903	135	651	1373	12
Future Volume (vph)	11	4	18	147	5	792	3	903	135	651	1373	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95		0.97	0.95	
Frpb, ped/bikes		1.00	0.98		1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1793	1558		1770	2765	1770	3462		3433	3534	
Flt Permitted		0.80	1.00		0.72	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1483	1558		1338	2765	1770	3462		3433	3534	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	12	4	19	158	5	852	3	971	145	700	1476	13
RTOR Reduction (vph)	0	0	16	0	0	37	0	11	0	0	0	0
Lane Group Flow (vph)	0	16	3	0	163	815	3	1105	0	700	1489	0
Confl. Peds. (#/hr)	2		3	3		2			5			4
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		17.6	17.6		17.6	53.6	1.3	41.5		36.0	76.2	
Effective Green, g (s)		17.6	17.6		17.6	53.6	1.3	41.5		36.0	76.2	
Actuated g/C Ratio		0.16	0.16		0.16	0.49	0.01	0.38		0.33	0.69	
Clearance Time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.5		3.0	3.5	
Lane Grp Cap (vph)		237	249		214	1462	20	1306		1123	2448	
v/s Ratio Prot						0.18	0.00	c0.32		0.20	c0.42	
v/s Ratio Perm		0.01	0.00		c0.12	0.11						
v/c Ratio		0.07	0.01		0.76	0.56	0.15	0.85		0.62	0.61	
Uniform Delay, d1		39.2	38.9		44.2	19.9	53.8	31.3		31.3	9.0	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1	0.0		14.7	0.5	3.5	6.9		1.1	1.1	
Delay (s)		39.4	38.9		58.9	20.3	57.3	38.2		32.4	10.1	
Level of Service		D	D		E	C	E	D		C	B	
Approach Delay (s)		39.1			26.5			38.3			17.2	
Approach LOS		D			C			D			B	

Intersection Summary			
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	24	12	45	35	5	289	2	6	741	17	358	1170
Future Volume (vph)	24	12	45	35	5	289	2	6	741	17	358	1170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.2		5.0	4.2		4.2	5.3		4.2	5.3
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95
Frpb, ped/bikes		1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00
Frt		1.00	0.85		1.00	0.85		1.00	1.00		1.00	1.00
Flt Protected		0.97	1.00		0.96	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)		1803	1546		1777	1578		1770	3526		1770	3526
Flt Permitted		0.79	1.00		0.72	1.00		0.95	1.00		0.95	1.00
Satd. Flow (perm)		1465	1546		1341	1578		1770	3526		1770	3526
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	13	49	38	5	314	2	7	805	18	389	1272
RTOR Reduction (vph)	0	0	45	0	0	0	0	0	1	0	0	1
Lane Group Flow (vph)	0	39	4	0	43	314	0	9	822	0	389	1300
Confl. Peds. (#/hr)			3	3						1		
Confl. Bikes (#/hr)			3			1						
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	Prot	NA		Prot	NA
Protected Phases		4			8	1	5	5	2		1	6
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		10.1	10.1		9.3	38.5		1.3	57.8		29.2	85.7
Effective Green, g (s)		10.1	10.1		9.3	38.5		1.3	57.8		29.2	85.7
Actuated g/C Ratio		0.09	0.09		0.08	0.35		0.01	0.52		0.26	0.77
Clearance Time (s)		4.2	4.2		5.0	4.2		4.2	5.3		4.2	5.3
Vehicle Extension (s)		3.0	3.0		3.5	2.0		2.0	4.0		2.0	4.0
Lane Grp Cap (vph)		133	140		112	548		20	1839		466	2727
v/s Ratio Prot						c0.15		0.01	0.23		c0.22	c0.37
v/s Ratio Perm		0.03	0.00		0.03	0.05						
v/c Ratio		0.29	0.03		0.38	0.57		0.45	0.45		0.83	0.48
Uniform Delay, d1		47.0	45.9		48.0	29.5		54.4	16.5		38.5	4.5
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		1.2	0.1		2.6	0.9		5.8	0.8		11.7	0.6
Delay (s)		48.2	46.0		50.6	30.4		60.2	17.3		50.2	5.1
Level of Service		D	D		D	C		E	B		D	A
Approach Delay (s)		47.0			32.8				17.8			15.5
Approach LOS		D			C				B			B

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	110.8	Sum of lost time (s)	14.5
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	27
Future Volume (vph)	27
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	29
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Confl. Bikes (#/hr)	1
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	0	26	745	34	7	26	1246
Future Volume (Veh/h)	0	26	745	34	7	26	1246
Sign Control	Stop		Free				Free
Grade	0%		0%				0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	27	784	36	0	27	1312
Pedestrians	1		1				1
Lane Width (ft)	12.0		12.0				12.0
Walking Speed (ft/s)	4.0		4.0				4.0
Percent Blockage	0		0				0
Right turn flare (veh)							
Median type			None				None
Median storage veh)							
Upstream signal (ft)			395				
pX, platoon unblocked	0.94	0.94			0.00	0.94	
vC, conflicting volume	1514	412			0	821	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1426	258			0	691	
tC, single (s)	6.8	6.9			0.0	4.1	
tC, 2 stage (s)							
tF (s)	3.5	3.3			0.0	2.2	
p0 queue free %	100	96			0	97	
cM capacity (veh/h)	115	698			0	848	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	27	523	297	27	656	656
Volume Left	0	0	0	27	0	0
Volume Right	27	0	36	0	0	0
cSH	698	1700	1700	848	1700	1700
Volume to Capacity	0.04	0.31	0.17	0.03	0.39	0.39
Queue Length 95th (ft)	3	0	0	2	0	0
Control Delay (s)	10.4	0.0	0.0	9.4	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	10.4	0.0		0.2		
Approach LOS	B					

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	44.8%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	76	107	3	22	696	1174	73
Future Volume (vph)	76	107	3	22	696	1174	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.2	6.5	6.5	
Lane Util. Factor	1.00			1.00	0.95	0.95	
Frpb, ped/bikes	1.00			1.00	1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	1.00	
Frt	0.92			1.00	1.00	0.99	
Flt Protected	0.98			0.95	1.00	1.00	
Satd. Flow (prot)	1681			1770	3539	3503	
Flt Permitted	0.98			0.95	1.00	1.00	
Satd. Flow (perm)	1681			1770	3539	3503	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	78	110	3	23	718	1210	75
RTOR Reduction (vph)	56	0	0	0	0	3	0
Lane Group Flow (vph)	132	0	0	26	718	1282	0
Confl. Peds. (#/hr)							2
Confl. Bikes (#/hr)							1
Turn Type	Prot		Prot	Prot	NA	NA	
Protected Phases	4		5	5	2	6	
Permitted Phases							
Actuated Green, G (s)	13.3			3.4	75.6	68.0	
Effective Green, g (s)	13.3			3.4	75.6	68.0	
Actuated g/C Ratio	0.13			0.03	0.76	0.68	
Clearance Time (s)	4.6			4.2	6.5	6.5	
Vehicle Extension (s)	3.0			3.0	4.0	4.0	
Lane Grp Cap (vph)	223			60	2675	2382	
v/s Ratio Prot	c0.08			c0.01	0.20	c0.37	
v/s Ratio Perm							
v/c Ratio	0.59			0.43	0.27	0.54	
Uniform Delay, d1	40.8			47.4	3.7	8.1	
Progression Factor	1.00			0.60	2.45	1.00	
Incremental Delay, d2	4.1			4.9	0.2	0.9	
Delay (s)	44.9			33.2	9.4	9.0	
Level of Service	D			C	A	A	
Approach Delay (s)	44.9				10.2	9.0	
Approach LOS	D				B	A	

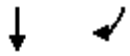
Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	54.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	18	17	58	16	22	37	4	33	667	8	2	24
Future Volume (vph)	18	17	58	16	22	37	4	33	667	8	2	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6			4.7	5.7			4.7
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95			1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00			1.00
Frt	1.00	0.88		1.00	0.91			1.00	1.00			1.00
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00			0.95
Satd. Flow (prot)	1767	1646		1770	1673			1770	3531			1770
Flt Permitted	0.72	1.00		0.70	1.00			0.95	1.00			0.95
Satd. Flow (perm)	1333	1646		1313	1673			1770	3531			1770
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	19	18	62	17	23	39	4	35	710	9	2	26
RTOR Reduction (vph)	0	57	0	0	36	0	0	0	1	0	0	0
Lane Group Flow (vph)	19	23	0	17	26	0	0	39	718	0	0	28
Confl. Peds. (#/hr)	1					1				2		
Confl. Bikes (#/hr)												
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8								
Actuated Green, G (s)	8.6	8.6		8.6	8.6			5.3	71.6			4.8
Effective Green, g (s)	8.6	8.6		8.6	8.6			5.3	71.6			4.8
Actuated g/C Ratio	0.09	0.09		0.09	0.09			0.05	0.72			0.05
Clearance Time (s)	4.6	4.6		4.6	4.6			4.7	5.7			4.7
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	4.0			3.0
Lane Grp Cap (vph)	114	141		112	143			93	2528			84
v/s Ratio Prot		0.01			c0.02			c0.02	0.20			0.02
v/s Ratio Perm	0.01			0.01								
v/c Ratio	0.17	0.17		0.15	0.18			0.42	0.28			0.33
Uniform Delay, d1	42.4	42.4		42.3	42.4			45.9	5.1			46.1
Progression Factor	1.00	1.00		1.00	1.00			1.42	0.47			0.98
Incremental Delay, d2	0.7	0.6		0.6	0.6			2.8	0.3			2.1
Delay (s)	43.1	42.9		43.0	43.1			67.9	2.7			47.5
Level of Service	D	D		D	D			E	A			D
Approach Delay (s)		43.0			43.0				6.0			
Approach LOS		D			D				A			

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1199	75
Future Volume (vph)	1199	75
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.7	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3504	
Flt Permitted	1.00	
Satd. Flow (perm)	3504	
Peak-hour factor, PHF	0.94	0.94
Adj. Flow (vph)	1276	80
RTOR Reduction (vph)	2	0
Lane Group Flow (vph)	1354	0
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		1
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	71.1	
Effective Green, g (s)	71.1	
Actuated g/C Ratio	0.71	
Clearance Time (s)	5.7	
Vehicle Extension (s)	4.0	
Lane Grp Cap (vph)	2491	
v/s Ratio Prot	c0.39	
v/s Ratio Perm		
v/c Ratio	0.54	
Uniform Delay, d1	6.8	
Progression Factor	1.42	
Incremental Delay, d2	0.8	
Delay (s)	10.5	
Level of Service	B	
Approach Delay (s)	11.2	
Approach LOS	B	

Intersection Summary

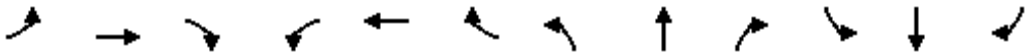
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	51	37	270	118	44	50	508	638	157	2	71	1043
Future Volume (vph)	51	37	270	118	44	50	508	638	157	2	71	1043
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0		4.6	5.7	5.7		4.6	6.7
Lane Util. Factor		1.00	1.00	1.00	1.00		0.97	0.95	1.00		1.00	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	0.97		1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt		1.00	0.85	1.00	0.92		1.00	1.00	0.85		1.00	1.00
Flt Protected		0.97	1.00	0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)		1810	1583	1770	1714		3433	3539	1542		1770	3539
Flt Permitted		0.97	1.00	0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)		1810	1583	1770	1714		3433	3539	1542		1770	3539
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	59	43	314	137	51	58	591	742	183	2	83	1213
RTOR Reduction (vph)	0	0	101	0	42	0	0	0	96	0	0	0
Lane Group Flow (vph)	0	102	213	137	67	0	591	742	87	0	85	1213
Confl. Peds. (#/hr)			10						2			
Confl. Bikes (#/hr)												
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA	Perm	Prot	Prot	NA
Protected Phases	4	4	4 5	3	3		5	2		1	1	6
Permitted Phases									2			
Actuated Green, G (s)		11.9	30.2	11.3	11.3		18.3	47.6	47.6		8.9	37.2
Effective Green, g (s)		11.9	30.2	11.3	11.3		18.3	47.6	47.6		8.9	37.2
Actuated g/C Ratio		0.12	0.30	0.11	0.11		0.18	0.48	0.48		0.09	0.37
Clearance Time (s)		5.0		5.0	5.0		4.6	5.7	5.7		4.6	6.7
Vehicle Extension (s)		3.0		3.0	3.0		3.0	4.0	4.0		3.0	4.0
Lane Grp Cap (vph)		215	478	200	193		628	1684	733		157	1316
v/s Ratio Prot		c0.06	0.13	c0.08	0.04		c0.17	0.21			0.05	c0.34
v/s Ratio Perm									0.06			
v/c Ratio		0.47	0.45	0.69	0.35		0.94	0.44	0.12		0.54	0.92
Uniform Delay, d1		41.1	28.1	42.6	41.0		40.3	17.4	14.6		43.6	30.0
Progression Factor		1.00	1.00	1.00	1.00		0.75	0.57	0.27		0.85	0.82
Incremental Delay, d2		1.7	0.7	9.3	1.1		21.8	0.8	0.3		3.4	11.0
Delay (s)		42.8	28.8	52.0	42.0		52.0	10.6	4.2		40.6	35.5
Level of Service		D	C	D	D		D	B	A		D	D
Approach Delay (s)		32.2			47.6			26.0				33.7
Approach LOS		C			D			C				C

Intersection Summary			
HCM 2000 Control Delay	31.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	111
Future Volume (vph)	111
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.7
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1552
Flt Permitted	1.00
Satd. Flow (perm)	1552
Peak-hour factor, PHF	0.86
Adj. Flow (vph)	129
RTOR Reduction (vph)	81
Lane Group Flow (vph)	48
Confl. Peds. (#/hr)	4
Confl. Bikes (#/hr)	1
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	37.2
Effective Green, g (s)	37.2
Actuated g/C Ratio	0.37
Clearance Time (s)	6.7
Vehicle Extension (s)	4.0
Lane Grp Cap (vph)	577
v/s Ratio Prot	
v/s Ratio Perm	0.03
v/c Ratio	0.08
Uniform Delay, d1	20.3
Progression Factor	0.60
Incremental Delay, d2	0.3
Delay (s)	12.4
Level of Service	B
Approach Delay (s)	
Approach LOS	

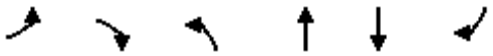
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	158	501	487	285	318	184	781	673	28	1354	65
Future Volume (vph)	45	158	501	487	285	318	184	781	673	28	1354	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	6.3	6.3	5.6	6.3		5.6	6.3	6.3	5.6	6.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		1.00	0.91	1.00	0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3539	1583	3433	3235		1770	5085	1583	3433	5046	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	3539	1583	3433	3235		1770	5085	1583	3433	5046	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	47	165	522	507	297	331	192	814	701	29	1410	68
RTOR Reduction (vph)	0	0	111	0	176	0	0	0	187	0	6	0
Lane Group Flow (vph)	47	165	411	507	452	0	192	814	514	29	1472	0
Confl. Peds. (#/hr)						1			10			3
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA	pt+ov	Prot	NA		Prot	NA	pt+ov	Prot	NA	
Protected Phases	7	4	4 5	3	8		5	2	2 3	1	6	
Permitted Phases												
Actuated Green, G (s)	4.5	11.8	29.7	17.2	24.5		17.9	43.1	66.6	4.1	29.3	
Effective Green, g (s)	4.5	11.8	29.7	17.2	24.5		17.9	43.1	66.6	4.1	29.3	
Actuated g/C Ratio	0.04	0.12	0.30	0.17	0.24		0.18	0.43	0.67	0.04	0.29	
Clearance Time (s)	5.6	6.3		5.6	6.3		5.6	6.3		5.6	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	154	417	470	590	792		316	2191	1054	140	1478	
v/s Ratio Prot	0.01	0.05	c0.26	c0.15	0.14		0.11	0.16	0.32	0.01	c0.29	
v/s Ratio Perm												
v/c Ratio	0.31	0.40	0.87	0.86	0.57		0.61	0.37	0.49	0.21	1.00	
Uniform Delay, d1	46.2	40.8	33.4	40.2	33.1		37.8	19.3	8.3	46.4	35.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.85	0.51	4.53	1.33	0.83	
Incremental Delay, d2	1.1	0.6	16.4	11.9	1.0		3.1	0.5	0.3	0.4	17.0	
Delay (s)	47.4	41.4	49.7	52.1	34.1		35.1	10.3	37.8	62.2	46.2	
Level of Service	D	D	D	D	C		D	B	D	E	D	
Approach Delay (s)		47.7			42.2			24.4			46.5	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	38.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	23.8
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	606	221	0	1035	1897	0
Future Volume (vph)	606	221	0	1035	1897	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		6.3	6.3	
Lane Util. Factor	0.97	1.00		0.86	0.81	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3433	1583		6408	7544	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3433	1583		6408	7544	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	638	233	0	1089	1997	0
RTOR Reduction (vph)	0	3	0	0	0	0
Lane Group Flow (vph)	638	230	0	1089	1997	0
Confl. Peds. (#/hr)						2
Confl. Bikes (#/hr)						1
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	23.6	23.6		64.5	64.5	
Effective Green, g (s)	23.6	23.6		64.5	64.5	
Actuated g/C Ratio	0.24	0.24		0.64	0.64	
Clearance Time (s)	5.6	5.6		6.3	6.3	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	810	373		4133	4865	
v/s Ratio Prot	c0.19			0.17	c0.26	
v/s Ratio Perm		0.15				
v/c Ratio	0.79	0.62		0.26	0.41	
Uniform Delay, d1	35.8	34.2		7.6	8.6	
Progression Factor	1.00	1.00		0.56	0.87	
Incremental Delay, d2	4.7	2.1		0.1	0.1	
Delay (s)	40.6	36.3		4.4	7.6	
Level of Service	D	D		A	A	
Approach Delay (s)	39.4			4.4	7.6	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

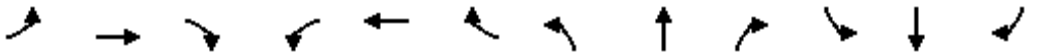
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	48	22	24	123	11	244	18	19	737	216	628	1404
Future Volume (vph)	48	22	24	123	11	244	18	19	737	216	628	1404
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		4.2	5.6	5.6		5.2	5.3		5.2	5.3
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	0.91		0.97	0.91
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	0.92		1.00	1.00	0.85		1.00	0.97		1.00	0.99
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1770	1700		1770	1863	1583		1770	4888		3433	5037
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.95	1.00		0.95	1.00
Satd. Flow (perm)	1770	1700		1770	1863	1583		1770	4888		3433	5037
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	52	24	26	132	12	262	19	20	792	232	675	1510
RTOR Reduction (vph)	0	24	0	0	0	126	0	0	50	0	0	5
Lane Group Flow (vph)	52	26	0	132	12	136	0	39	974	0	675	1590
Confl. Peds. (#/hr)			6							6		
Confl. Bikes (#/hr)										1		
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	Prot	NA		Prot	NA
Protected Phases	7	4		3	8	8 1	5	5	2		1	6
Permitted Phases												
Actuated Green, G (s)	7.1	6.7		10.3	8.5	41.2		4.5	30.0		32.7	58.2
Effective Green, g (s)	7.1	6.7		10.3	8.5	41.2		4.5	30.0		32.7	58.2
Actuated g/C Ratio	0.07	0.07		0.10	0.08	0.41		0.04	0.30		0.33	0.58
Clearance Time (s)	5.6	5.6		4.2	5.6			5.2	5.3		5.2	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	2.0		3.0	2.0
Lane Grp Cap (vph)	125	113		182	158	652		79	1466		1122	2931
v/s Ratio Prot	0.03	0.02		c0.07	0.01	c0.09		0.02	c0.20		c0.20	0.32
v/s Ratio Perm												
v/c Ratio	0.42	0.23		0.73	0.08	0.21		0.49	0.66		0.60	0.54
Uniform Delay, d1	44.5	44.2		43.5	42.1	18.9		46.6	30.6		28.2	12.8
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		0.74	0.43
Incremental Delay, d2	2.2	1.0		13.4	0.2	0.2		4.8	2.4		0.9	0.7
Delay (s)	46.7	45.2		56.9	42.3	19.1		51.4	33.0		21.8	6.2
Level of Service	D	D		E	D	B		D	C		C	A
Approach Delay (s)		46.0			32.0				33.7			10.8
Approach LOS		D			C				C			B

Intersection Summary			
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	21.7
Intersection Capacity Utilization	64.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	79
Future Volume (vph)	79
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	85
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	2
Confl. Bikes (#/hr)	1
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	123	282	77	80	35	327	1239	133	39	739	60
Future Volume (vph)	135	123	282	77	80	35	327	1239	133	39	739	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7		4.6	5.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95		0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1574	1770	1863	1583	3433	3483		3433	3494	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1574	1770	1863	1583	3433	3483		3433	3494	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	141	128	294	80	83	36	341	1291	139	41	770	62
RTOR Reduction (vph)	0	0	107	0	0	32	0	5	0	0	4	0
Lane Group Flow (vph)	141	128	187	80	83	4	341	1425	0	41	829	0
Confl. Peds. (#/hr)			1									2
Confl. Bikes (#/hr)									2			2
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	13.2	17.2	42.4	9.3	13.3	13.3	25.2	77.8		5.5	57.0	
Effective Green, g (s)	13.2	17.2	42.4	9.3	13.3	13.3	25.2	77.8		5.5	57.0	
Actuated g/C Ratio	0.10	0.13	0.33	0.07	0.10	0.10	0.19	0.60		0.04	0.44	
Clearance Time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7		4.6	5.7	
Vehicle Extension (s)	2.5	3.0	2.5	2.5	3.0	3.0	2.5	3.5		2.5	3.5	
Lane Grp Cap (vph)	179	246	513	126	190	161	665	2084		145	1531	
v/s Ratio Prot	c0.08	c0.07	0.07	0.05	0.04		0.10	c0.41		0.01	c0.24	
v/s Ratio Perm			0.05			0.00						
v/c Ratio	0.79	0.52	0.36	0.63	0.44	0.02	0.51	0.68		0.28	0.54	
Uniform Delay, d1	57.0	52.6	33.5	58.7	54.8	52.5	46.9	17.7		60.3	26.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.71	0.42		1.00	1.00	
Incremental Delay, d2	19.5	2.0	0.3	8.8	1.6	0.1	0.4	1.4		0.8	1.4	
Delay (s)	76.5	54.5	33.8	67.5	56.4	52.6	33.5	8.8		61.1	28.2	
Level of Service	E	D	C	E	E	D	C	A		E	C	
Approach Delay (s)		49.2			60.2			13.5			29.8	
Approach LOS		D			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

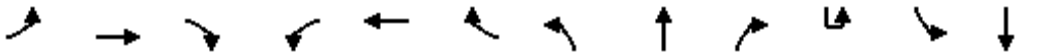
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	113	63	130	61	22	5	33	86	1570	144	2	11
Future Volume (vph)	113	63	130	61	22	5	33	86	1570	144	2	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6			4.6	5.7	5.7		4.6
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00			1.00	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00			1.00	1.00	0.98		1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00		1.00
Frt	1.00	1.00	0.85	1.00	0.97			1.00	1.00	0.85		1.00
Flt Protected	0.95	0.99	1.00	0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (prot)	1681	1744	1546	1770	1813			1770	3539	1550		1770
Flt Permitted	0.95	0.99	1.00	0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (perm)	1681	1744	1546	1770	1813			1770	3539	1550		1770
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	118	66	135	64	23	5	34	90	1635	150	2	11
RTOR Reduction (vph)	0	0	122	0	5	0	0	0	0	40	0	0
Lane Group Flow (vph)	91	93	13	64	23	0	0	124	1635	110	0	13
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			1							2		
Turn Type	Split	NA	Perm	Split	NA		Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	7		8	8		5	5	2		1	1
Permitted Phases			7							2		
Actuated Green, G (s)	12.9	12.9	12.9	8.2	8.2			14.0	85.7	85.7		3.7
Effective Green, g (s)	12.9	12.9	12.9	8.2	8.2			14.0	85.7	85.7		3.7
Actuated g/C Ratio	0.10	0.10	0.10	0.06	0.06			0.11	0.66	0.66		0.03
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6			4.6	5.7	5.7		4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			2.5	4.0	4.0		2.5
Lane Grp Cap (vph)	166	173	153	111	114			190	2333	1021		50
v/s Ratio Prot	c0.05	0.05		c0.04	0.01			0.07	c0.46			0.01
v/s Ratio Perm			0.01							0.07		
v/c Ratio	0.55	0.54	0.09	0.58	0.20			0.65	0.70	0.11		0.26
Uniform Delay, d1	55.8	55.7	53.2	59.2	57.8			55.7	14.0	8.1		61.8
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.23	0.61	0.78		0.74
Incremental Delay, d2	3.7	3.2	0.2	7.1	0.9			4.6	1.2	0.1		1.8
Delay (s)	59.4	58.9	53.5	66.3	58.7			72.9	9.7	6.5		47.3
Level of Service	E	E	D	E	E			E	A	A		D
Approach Delay (s)		56.8			64.0				13.6			
Approach LOS		E			E				B			

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1028	45
Future Volume (vph)	1028	45
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.7	5.7
Lane Util. Factor	0.95	1.00
Frpb, ped/bikes	1.00	0.98
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	3539	1550
Flt Permitted	1.00	1.00
Satd. Flow (perm)	3539	1550
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	1071	47
RTOR Reduction (vph)	0	20
Lane Group Flow (vph)	1071	27
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		2
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	75.4	75.4
Effective Green, g (s)	75.4	75.4
Actuated g/C Ratio	0.58	0.58
Clearance Time (s)	5.7	5.7
Vehicle Extension (s)	4.0	4.0
Lane Grp Cap (vph)	2052	899
v/s Ratio Prot	c0.30	
v/s Ratio Perm		0.02
v/c Ratio	0.52	0.03
Uniform Delay, d1	16.4	11.7
Progression Factor	0.53	0.05
Incremental Delay, d2	0.8	0.1
Delay (s)	9.5	0.7
Level of Service	A	A
Approach Delay (s)	9.6	
Approach LOS	A	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	0	0	25	0	0	63	27	1750	30	1	24	1213
Future Volume (Veh/h)	0	0	25	0	0	63	27	1750	30	1	24	1213
Sign Control		Stop			Stop			Free				Free
Grade		0%			0%			0%				0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	27	0	0	67	29	1862	32	0	26	1290
Pedestrians		13			21			13				17
Lane Width (ft)		12.0			12.0			12.0				12.0
Walking Speed (ft/s)		4.0			4.0			4.0				4.0
Percent Blockage		1			2			1				1
Right turn flare (veh)												
Median type								None				None
Median storage veh)												
Upstream signal (ft)												901
pX, platoon unblocked	0.82	0.82	0.82	0.82	0.82		0.82			0.00		
vC, conflicting volume	2434	3334	677	2694	3324	985	1315			0	1915	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2306	3410	152	2625	3397	985	934			0	1915	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			0.0	4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			0.0	2.2	
p0 queue free %	100	100	96	100	100	72	95			0	91	
cM capacity (veh/h)	10	5	692	8	5	239	588			0	300	

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	27	67	29	1241	653	26	860	442
Volume Left	0	0	29	0	0	26	0	0
Volume Right	27	67	0	0	32	0	0	12
cSH	692	239	588	1700	1700	300	1700	1700
Volume to Capacity	0.04	0.28	0.05	0.73	0.38	0.09	0.51	0.26
Queue Length 95th (ft)	3	28	4	0	0	7	0	0
Control Delay (s)	10.4	25.8	11.4	0.0	0.0	18.1	0.0	0.0
Lane LOS	B	D	B			C		
Approach Delay (s)	10.4	25.8	0.2			0.4		
Approach LOS	B	D						

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	65.0%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	11
Future Volume (Veh/h)	11
Sign Control	
Grade	
Peak Hour Factor	0.94
Hourly flow rate (vph)	12
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (s)	
p0 queue free %	
cM capacity (veh/h)	
Direction, Lane #	

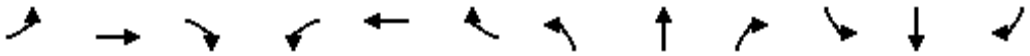
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	8	246	801	582	16	264	571	261	385	1280	233	35
Future Volume (vph)	8	246	801	582	16	264	571	261	385	1280	233	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	7.0	6.0		5.0	7.0	7.0	6.0	7.0	7.0	
Lane Util. Factor		0.97	0.91	1.00		0.97	0.95	1.00	0.97	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.99		1.00	1.00	0.96	1.00	1.00	0.98	
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)		3433	5085	1561		3433	3539	1525	3433	3539	1544	
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)		3433	5085	1561		3433	3539	1525	3433	3539	1544	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	8	254	826	600	16	272	589	269	397	1320	240	36
RTOR Reduction (vph)	0	0	0	72	0	0	0	167	0	0	141	0
Lane Group Flow (vph)	0	262	826	528	0	288	589	102	397	1320	99	0
Confl. Peds. (#/hr)				11				18			8	
Confl. Bikes (#/hr)				2								
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	Perm	Prot	NA	Perm	Prot
Protected Phases	5	5	2	3	1	1	6		3	8		7
Permitted Phases				2				6			8	
Actuated Green, G (s)		14.4	23.9	49.9		14.9	24.4	24.4	26.0	51.4	51.4	
Effective Green, g (s)		14.4	23.9	49.9		14.9	24.4	24.4	26.0	51.4	51.4	
Actuated g/C Ratio		0.11	0.18	0.38		0.11	0.19	0.19	0.20	0.40	0.40	
Clearance Time (s)		5.0	7.0	6.0		5.0	7.0	7.0	6.0	7.0	7.0	
Vehicle Extension (s)		3.0	5.0	3.0		3.0	5.0	5.0	3.0	4.0	4.0	
Lane Grp Cap (vph)		380	934	599		393	664	286	686	1399	610	
v/s Ratio Prot		0.08	0.16	0.18		c0.08	c0.17		0.12	c0.37		
v/s Ratio Perm				0.16				0.07			0.06	
v/c Ratio		0.69	0.88	0.88		0.73	0.89	0.36	0.58	0.94	0.16	
Uniform Delay, d1		55.6	51.7	37.3		55.6	51.5	46.0	47.0	37.9	25.4	
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		5.2	10.7	14.2		6.9	14.5	1.6	1.2	13.9	0.6	
Delay (s)		60.8	62.4	51.5		62.5	66.0	47.6	48.2	51.8	26.0	
Level of Service		E	E	D		E	E	D	D	D	C	
Approach Delay (s)			58.3				60.8			47.9		
Approach LOS			E				E			D		

Intersection Summary			
HCM 2000 Control Delay	53.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	252	853	111
Future Volume (vph)	252	853	111
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	5.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1528
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1528
Peak-hour factor, PHF	0.97	0.97	0.97
Adj. Flow (vph)	260	879	114
RTOR Reduction (vph)	0	0	79
Lane Group Flow (vph)	296	879	35
Confl. Peds. (#/hr)			18
Confl. Bikes (#/hr)			
Turn Type	Prot	NA	Perm
Protected Phases	7	4	
Permitted Phases			4
Actuated Green, G (s)	15.8	40.2	40.2
Effective Green, g (s)	15.8	40.2	40.2
Actuated g/C Ratio	0.12	0.31	0.31
Clearance Time (s)	5.0	7.0	7.0
Vehicle Extension (s)	3.0	4.0	4.0
Lane Grp Cap (vph)	417	1094	472
v/s Ratio Prot	0.09	c0.25	
v/s Ratio Perm			0.02
v/c Ratio	0.71	0.80	0.07
Uniform Delay, d1	54.9	41.3	31.7
Progression Factor	0.70	0.97	2.06
Incremental Delay, d2	5.0	5.7	0.3
Delay (s)	43.2	45.7	65.8
Level of Service	D	D	E
Approach Delay (s)		46.9	
Approach LOS		D	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	10	4	68	6	518	12	1446	153	764	1077	22
Future Volume (vph)	12	10	4	68	6	518	12	1446	153	764	1077	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95		0.97	0.95	
Frpb, ped/bikes		1.00	0.98		1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.97	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1807	1548		1776	2766	1770	3482		3433	3525	
Flt Permitted		0.82	1.00		0.73	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1532	1548		1349	2766	1770	3482		3433	3525	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	12	10	4	71	6	540	12	1506	159	796	1122	23
RTOR Reduction (vph)	0	0	4	0	0	40	0	5	0	0	1	0
Lane Group Flow (vph)	0	23	0	0	77	500	13	1660	0	796	1144	0
Confl. Peds. (#/hr)	3		2	2		3			5			8
Confl. Bikes (#/hr)			3									3
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		11.7	11.7		11.7	43.7	3.0	71.4		32.0	100.4	
Effective Green, g (s)		11.7	11.7		11.7	43.7	3.0	71.4		32.0	100.4	
Actuated g/C Ratio		0.09	0.09		0.09	0.34	0.02	0.55		0.25	0.77	
Clearance Time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.5		3.0	3.5	
Lane Grp Cap (vph)		137	139		121	1027	40	1912		845	2722	
v/s Ratio Prot						0.12	0.01	c0.48		c0.23	0.32	
v/s Ratio Perm		0.02	0.00		c0.06	0.06						
v/c Ratio		0.17	0.00		0.64	0.49	0.33	0.87		0.94	0.42	
Uniform Delay, d1		54.7	53.8		57.1	34.2	62.5	25.2		48.1	5.0	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6	0.0		10.5	0.4	4.7	5.7		18.4	0.5	
Delay (s)		55.2	53.8		67.6	34.6	67.2	30.9		66.5	5.5	
Level of Service		E	D		E	C	E	C		E	A	
Approach Delay (s)		55.0			38.7			31.2			30.5	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	28	19	14	42	28	300	6	40	1339	49	255	858
Future Volume (vph)	28	19	14	42	28	300	6	40	1339	49	255	858
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.2		5.0	4.2		4.2	5.3		4.2	5.3
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95
Frpb, ped/bikes		1.00	0.97		1.00	0.99		1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00
Frt		1.00	0.85		1.00	0.85		1.00	0.99		1.00	0.99
Flt Protected		0.97	1.00		0.97	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)		1800	1540		1805	1573		1770	3517		1770	3514
Flt Permitted		0.79	1.00		0.79	1.00		0.95	1.00		0.95	1.00
Satd. Flow (perm)		1460	1540		1463	1573		1770	3517		1770	3514
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	30	20	15	45	30	319	6	43	1424	52	271	913
RTOR Reduction (vph)	0	0	14	0	0	0	0	0	2	0	0	2
Lane Group Flow (vph)	0	50	1	0	75	319	0	49	1474	0	271	957
Confl. Peds. (#/hr)	4		5	2		4				2		
Confl. Bikes (#/hr)			3							1		
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	Prot	NA		Prot	NA
Protected Phases		4			8	1	5	5	2		1	6
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		12.4	12.4		11.6	36.8		7.1	79.2		25.2	97.3
Effective Green, g (s)		12.4	12.4		11.6	36.8		7.1	79.2		25.2	97.3
Actuated g/C Ratio		0.10	0.10		0.09	0.28		0.05	0.61		0.19	0.75
Clearance Time (s)		4.2	4.2		5.0	4.2		4.2	5.3		4.2	5.3
Vehicle Extension (s)		3.0	3.0		3.5	2.0		2.0	4.0		2.0	4.0
Lane Grp Cap (vph)		138	146		130	494		96	2134		341	2620
v/s Ratio Prot						c0.12		0.03	c0.42		c0.15	0.27
v/s Ratio Perm		0.03	0.00		0.05	0.08						
v/c Ratio		0.36	0.01		0.58	0.65		0.51	0.69		0.79	0.37
Uniform Delay, d1		55.3	53.5		57.1	41.1		60.0	17.4		50.2	5.8
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		1.6	0.0		6.5	2.2		1.9	1.9		11.3	0.4
Delay (s)		57.0	53.5		63.6	43.3		61.9	19.2		61.5	6.2
Level of Service		E	D		E	D		E	B		E	A
Approach Delay (s)		56.2			47.2				20.6			18.4
Approach LOS		E			D				C			B

Intersection Summary			
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	130.5	Sum of lost time (s)	14.5
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	43
Future Volume (vph)	43
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	46
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	0	14	1481	60	5	14	915
Future Volume (Veh/h)	0	14	1481	60	5	14	915
Sign Control	Stop		Free				Free
Grade	0%		0%				0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	15	1592	65	0	15	984
Pedestrians	5						4
Lane Width (ft)	12.0						12.0
Walking Speed (ft/s)	4.0						4.0
Percent Blockage	0						0
Right turn flare (veh)							
Median type			None				None
Median storage veh)							
Upstream signal (ft)			350				
pX, platoon unblocked	0.83	0.83			0.00	0.83	
vC, conflicting volume	2152	838			0	1662	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1981	402			0	1393	
tC, single (s)	6.8	6.9			0.0	4.1	
tC, 2 stage (s)							
tF (s)	3.5	3.3			0.0	2.2	
p0 queue free %	100	97			0	96	
cM capacity (veh/h)	43	494			0	404	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	15	1061	596	15	492	492
Volume Left	0	0	0	15	0	0
Volume Right	15	0	65	0	0	0
cSH	494	1700	1700	404	1700	1700
Volume to Capacity	0.03	0.62	0.35	0.04	0.29	0.29
Queue Length 95th (ft)	2	0	0	3	0	0
Control Delay (s)	12.5	0.0	0.0	14.3	0.0	0.0
Lane LOS	B			B		
Approach Delay (s)	12.5	0.0		0.2		
Approach LOS	B					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	53	68	1	83	1501	851	64
Future Volume (vph)	53	68	1	83	1501	851	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.2	6.5	6.5	
Lane Util. Factor	1.00			1.00	0.95	0.95	
Frpb, ped/bikes	1.00			1.00	1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	1.00	
Frt	0.92			1.00	1.00	0.99	
Flt Protected	0.98			0.95	1.00	1.00	
Satd. Flow (prot)	1685			1770	3539	3495	
Flt Permitted	0.98			0.95	1.00	1.00	
Satd. Flow (perm)	1685			1770	3539	3495	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	57	73	1	89	1614	915	69
RTOR Reduction (vph)	46	0	0	0	0	3	0
Lane Group Flow (vph)	84	0	0	90	1614	981	0
Confl. Peds. (#/hr)							3
Confl. Bikes (#/hr)							2
Turn Type	Prot		Prot	Prot	NA	NA	
Protected Phases	4		5	5	2	6	
Permitted Phases							
Actuated Green, G (s)	11.7			9.6	87.2	73.4	
Effective Green, g (s)	11.7			9.6	87.2	73.4	
Actuated g/C Ratio	0.11			0.09	0.79	0.67	
Clearance Time (s)	4.6			4.2	6.5	6.5	
Vehicle Extension (s)	3.0			3.0	4.0	4.0	
Lane Grp Cap (vph)	179			154	2805	2332	
v/s Ratio Prot	c0.05			0.05	c0.46	0.28	
v/s Ratio Perm							
v/c Ratio	0.47			0.58	0.58	0.42	
Uniform Delay, d1	46.2			48.3	4.3	8.5	
Progression Factor	1.00			1.19	0.17	1.00	
Incremental Delay, d2	1.9			4.9	0.8	0.6	
Delay (s)	48.1			62.1	1.5	9.0	
Level of Service	D			E	A	A	
Approach Delay (s)	48.1				4.7	9.0	
Approach LOS	D				A	A	

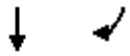
Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	15	11	41	27	22	27	2	92	1524	46	4	28
Future Volume (vph)	15	11	41	27	22	27	2	92	1524	46	4	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6			4.7	5.7			4.7
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95			1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00			1.00
Frt	1.00	0.88		1.00	0.92			1.00	1.00			1.00
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00			0.95
Satd. Flow (prot)	1770	1642		1770	1694			1770	3521			1770
Flt Permitted	0.72	1.00		0.72	1.00			0.95	1.00			0.95
Satd. Flow (perm)	1345	1642		1341	1694			1770	3521			1770
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	16	12	45	30	24	30	2	101	1675	51	4	31
RTOR Reduction (vph)	0	41	0	0	27	0	0	0	1	0	0	0
Lane Group Flow (vph)	16	16	0	30	27	0	0	103	1725	0	0	35
Confl. Peds. (#/hr)										2		
Confl. Bikes (#/hr)						1				1		
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8								
Actuated Green, G (s)	9.2	9.2		9.2	9.2			11.7	80.5			5.3
Effective Green, g (s)	9.2	9.2		9.2	9.2			11.7	80.5			5.3
Actuated g/C Ratio	0.08	0.08		0.08	0.08			0.11	0.73			0.05
Clearance Time (s)	4.6	4.6		4.6	4.6			4.7	5.7			4.7
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	4.0			3.0
Lane Grp Cap (vph)	112	137		112	141			188	2576			85
v/s Ratio Prot		0.01			0.02			c0.06	c0.49			0.02
v/s Ratio Perm	0.01			c0.02								
v/c Ratio	0.14	0.12		0.27	0.19			0.55	0.67			0.41
Uniform Delay, d1	46.7	46.6		47.2	46.9			46.6	7.8			50.8
Progression Factor	1.00	1.00		1.00	1.00			1.05	0.67			0.80
Incremental Delay, d2	0.6	0.4		1.3	0.6			2.2	1.0			3.0
Delay (s)	47.3	47.0		48.5	47.6			51.1	6.2			43.7
Level of Service	D	D		D	D			D	A			D
Approach Delay (s)		47.1			47.9				8.7			
Approach LOS		D			D				A			

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	855	26
Future Volume (vph)	855	26
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.7	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	3520	
Flt Permitted	1.00	
Satd. Flow (perm)	3520	
Peak-hour factor, PHF	0.91	0.91
Adj. Flow (vph)	940	29
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	968	0
Confl. Peds. (#/hr)		3
Confl. Bikes (#/hr)		2
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	74.1	
Effective Green, g (s)	74.1	
Actuated g/C Ratio	0.67	
Clearance Time (s)	5.7	
Vehicle Extension (s)	4.0	
Lane Grp Cap (vph)	2371	
v/s Ratio Prot	0.27	
v/s Ratio Perm		
v/c Ratio	0.41	
Uniform Delay, d1	8.1	
Progression Factor	1.19	
Incremental Delay, d2	0.5	
Delay (s)	10.1	
Level of Service	B	
Approach Delay (s)	11.2	
Approach LOS	B	

Intersection Summary

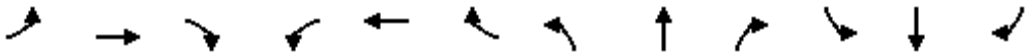
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	118	40	400	109	57	78	385	1452	215	1	39	782
Future Volume (vph)	118	40	400	109	57	78	385	1452	215	1	39	782
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0		4.6	5.7	5.7		4.6	6.7
Lane Util. Factor		1.00	1.00	1.00	1.00		0.97	0.95	1.00		1.00	0.95
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.97		1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt		1.00	0.85	1.00	0.91		1.00	1.00	0.85		1.00	1.00
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)		1796	1583	1770	1687		3433	3539	1540		1770	3539
Flt Permitted		0.96	1.00	0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)		1796	1583	1770	1687		3433	3539	1540		1770	3539
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	123	42	417	114	59	81	401	1512	224	1	41	815
RTOR Reduction (vph)	0	0	113	0	47	0	0	0	79	0	0	0
Lane Group Flow (vph)	0	165	304	114	93	0	401	1513	145	0	42	815
Confl. Peds. (#/hr)			17						2			
Confl. Bikes (#/hr)						1			1			
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA	Perm	Prot	Prot	NA
Protected Phases	4	4	4 5	3	3		5	2		1	1	6
Permitted Phases									2			
Actuated Green, G (s)		14.6	33.7	12.2	12.2		19.1	57.3	57.3		5.6	42.8
Effective Green, g (s)		14.6	33.7	12.2	12.2		19.1	57.3	57.3		5.6	42.8
Actuated g/C Ratio		0.13	0.31	0.11	0.11		0.17	0.52	0.52		0.05	0.39
Clearance Time (s)		5.0		5.0	5.0		4.6	5.7	5.7		4.6	6.7
Vehicle Extension (s)		3.0		3.0	3.0		3.0	4.0	4.0		3.0	4.0
Lane Grp Cap (vph)		238	484	196	187		596	1843	802		90	1376
v/s Ratio Prot		c0.09	0.19	c0.06	0.06		0.12	c0.43			0.02	c0.23
v/s Ratio Perm									0.09			
v/c Ratio		0.69	0.63	0.58	0.50		0.67	0.82	0.18		0.47	0.59
Uniform Delay, d1		45.6	32.8	46.5	46.0		42.5	22.1	13.9		50.7	26.7
Progression Factor		1.00	1.00	1.00	1.00		0.79	0.62	0.25		0.72	1.32
Incremental Delay, d2		8.4	2.5	4.3	2.1		2.2	3.1	0.4		3.6	1.8
Delay (s)		54.0	35.3	50.8	48.1		35.6	16.7	3.9		40.2	37.0
Level of Service		D	D	D	D		D	B	A		D	D
Approach Delay (s)		40.6			49.3			18.9				44.3
Approach LOS		D			D			B				D

Intersection Summary			
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	86
Future Volume (vph)	86
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.7
Lane Util. Factor	1.00
Frpb, ped/bikes	0.97
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1538
Flt Permitted	1.00
Satd. Flow (perm)	1538
Peak-hour factor, PHF	0.96
Adj. Flow (vph)	90
RTOR Reduction (vph)	55
Lane Group Flow (vph)	35
Confl. Peds. (#/hr)	8
Confl. Bikes (#/hr)	1
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	42.8
Effective Green, g (s)	42.8
Actuated g/C Ratio	0.39
Clearance Time (s)	6.7
Vehicle Extension (s)	4.0
Lane Grp Cap (vph)	598
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.06
Uniform Delay, d1	21.0
Progression Factor	5.33
Incremental Delay, d2	0.2
Delay (s)	112.1
Level of Service	F
Approach Delay (s)	
Approach LOS	

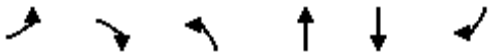
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	184	441	474	394	416	340	1550	622	32	1172	82
Future Volume (vph)	90	184	441	474	394	416	340	1550	622	32	1172	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	6.3	6.3	5.6	6.3		5.6	6.3	6.3	5.6	6.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		1.00	0.91	1.00	0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3539	1583	3433	3241		1770	5085	1583	3433	5030	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	3539	1583	3433	3241		1770	5085	1583	3433	5030	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	93	190	455	489	406	429	351	1598	641	33	1208	85
RTOR Reduction (vph)	0	0	110	0	113	0	0	0	78	0	7	0
Lane Group Flow (vph)	93	190	345	489	722	0	351	1598	563	33	1286	0
Confl. Peds. (#/hr)						2			12			
Confl. Bikes (#/hr)												2
Turn Type	Prot	NA	pt+ov	Prot	NA		Prot	NA	pt+ov	Prot	NA	
Protected Phases	7	4	4 5	3	8		5	2	2 3	1	6	
Permitted Phases												
Actuated Green, G (s)	6.5	13.5	49.4	14.4	21.4		35.9	54.9	75.6	3.4	22.4	
Effective Green, g (s)	6.5	13.5	49.4	14.4	21.4		35.9	54.9	75.6	3.4	22.4	
Actuated g/C Ratio	0.06	0.12	0.45	0.13	0.19		0.33	0.50	0.69	0.03	0.20	
Clearance Time (s)	5.6	6.3		5.6	6.3		5.6	6.3		5.6	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	202	434	710	449	630		577	2537	1087	106	1024	
v/s Ratio Prot	0.03	0.05	0.22	c0.14	c0.22		0.20	c0.31	0.36	0.01	c0.26	
v/s Ratio Perm												
v/c Ratio	0.46	0.44	0.49	1.09	1.15		0.61	0.63	0.52	0.31	1.26	
Uniform Delay, d1	50.1	44.7	21.4	47.8	44.3		31.1	20.1	8.4	52.2	43.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.66	0.51	0.52	1.20	1.24	
Incremental Delay, d2	1.7	0.7	0.5	68.7	83.5		1.7	1.1	0.4	1.4	121.6	
Delay (s)	51.7	45.4	21.9	116.5	127.8		22.3	11.3	4.7	63.7	176.1	
Level of Service	D	D	C	F	F		C	B	A	E	F	
Approach Delay (s)		31.7			123.6			11.2			173.3	
Approach LOS		C			F			B			F	

Intersection Summary			
HCM 2000 Control Delay	74.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	23.8
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	592	283	0	1917	1647	0
Future Volume (vph)	592	283	0	1917	1647	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		6.3	6.3	
Lane Util. Factor	0.97	1.00		0.86	0.81	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3433	1583		6408	7544	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3433	1583		6408	7544	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	610	292	0	1976	1698	0
RTOR Reduction (vph)	0	5	0	0	0	0
Lane Group Flow (vph)	610	287	0	1976	1698	0
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	26.1	26.1		72.0	72.0	
Effective Green, g (s)	26.1	26.1		72.0	72.0	
Actuated g/C Ratio	0.24	0.24		0.65	0.65	
Clearance Time (s)	5.6	5.6		6.3	6.3	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	814	375		4194	4937	
v/s Ratio Prot	0.18			c0.31	0.23	
v/s Ratio Perm		c0.18				
v/c Ratio	0.75	0.77		0.47	0.34	
Uniform Delay, d1	38.9	39.1		9.5	8.5	
Progression Factor	1.00	1.00		0.33	1.28	
Incremental Delay, d2	3.3	8.2		0.2	0.1	
Delay (s)	42.3	47.3		3.3	10.9	
Level of Service	D	D		A	B	
Approach Delay (s)	43.9			3.3	10.9	
Approach LOS	D			A	B	

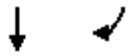
Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	65	36	18	1	168	9	517	12	7	1318	265	693
Future Volume (vph)	65	36	18	1	168	9	517	12	7	1318	265	693
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6			5.6	5.6	5.6		5.2	5.3		5.2
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00		1.00	0.91		0.97
Frpb, ped/bikes	1.00	0.99			1.00	1.00	1.00		1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00		1.00
Frt	1.00	0.95			1.00	1.00	0.85		1.00	0.97		1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	1.00		0.95
Satd. Flow (prot)	1770	1752			1770	1863	1583		1770	4934		3433
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.95	1.00		0.95
Satd. Flow (perm)	1770	1752			1770	1863	1583		1770	4934		3433
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	66	37	18	1	171	9	528	12	7	1345	270	707
RTOR Reduction (vph)	0	17	0	0	0	0	75	0	0	27	0	0
Lane Group Flow (vph)	66	38	0	0	172	9	453	0	19	1588	0	707
Confl. Peds. (#/hr)			7								9	
Confl. Bikes (#/hr)			4								4	
Turn Type	Prot	NA		Prot	Prot	NA	pt+ov	Prot	Prot	NA		Prot
Protected Phases	7	4		3	3	8	8 1	5	5	2		1
Permitted Phases												
Actuated Green, G (s)	6.9	8.0			11.4	12.5	46.3		3.2	35.1		33.8
Effective Green, g (s)	6.9	8.0			11.4	12.5	46.3		3.2	35.1		33.8
Actuated g/C Ratio	0.06	0.07			0.10	0.11	0.42		0.03	0.32		0.31
Clearance Time (s)	5.6	5.6			5.6	5.6			5.2	5.3		5.2
Vehicle Extension (s)	3.0	3.0			3.0	3.0			3.0	2.0		3.0
Lane Grp Cap (vph)	111	127			183	211	666		51	1574		1054
v/s Ratio Prot	0.04	0.02			c0.10	0.00	c0.29		0.01	c0.32		0.21
v/s Ratio Perm												
v/c Ratio	0.59	0.30			0.94	0.04	0.68		0.37	1.01		0.67
Uniform Delay, d1	50.2	48.4			49.0	43.4	25.8		52.4	37.5		33.2
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00		1.16
Incremental Delay, d2	8.3	1.3			48.7	0.1	2.8		4.5	24.8		1.6
Delay (s)	58.5	49.7			97.7	43.5	28.6		57.0	62.3		40.0
Level of Service	E	D			F	D	C		E	E		D
Approach Delay (s)		54.5				45.6				62.2		
Approach LOS		D				D				E		

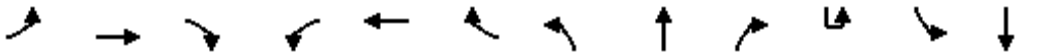
Intersection Summary			
HCM 2000 Control Delay	41.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.7
Intersection Capacity Utilization	80.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1161	51
Future Volume (vph)	1161	51
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	5049	
Flt Permitted	1.00	
Satd. Flow (perm)	5049	
Peak-hour factor, PHF	0.98	0.98
Adj. Flow (vph)	1185	52
RTOR Reduction (vph)	4	0
Lane Group Flow (vph)	1233	0
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		1
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	65.7	
Effective Green, g (s)	65.7	
Actuated g/C Ratio	0.60	
Clearance Time (s)	5.3	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	3015	
v/s Ratio Prot	0.24	
v/s Ratio Perm		
v/c Ratio	0.41	
Uniform Delay, d1	11.8	
Progression Factor	0.84	
Incremental Delay, d2	0.4	
Delay (s)	10.3	
Level of Service	B	
Approach Delay (s)	21.1	
Approach LOS	C	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	36	69	192	130	130	50	241	829	44	1	32	1085
Future Volume (vph)	36	69	192	130	130	50	241	829	44	1	32	1085
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7			4.6	5.7
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95			1.00	0.95
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99			1.00	0.98
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	1770	1863	1568	1770	1863	1552	3433	3508			1770	3459
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	1770	1863	1568	1770	1863	1552	3433	3508			1770	3459
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	39	74	206	140	140	54	259	891	47	1	34	1167
RTOR Reduction (vph)	0	0	145	0	0	46	0	3	0	0	0	10
Lane Group Flow (vph)	39	74	61	140	140	8	259	935	0	0	35	1339
Confl. Peds. (#/hr)			6			4			3			
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA		Prot	Prot	NA
Protected Phases	7	4	5	3	8		5	2		1	1	6
Permitted Phases			4			8						
Actuated Green, G (s)	6.8	9.8	22.0	13.7	16.7	16.7	12.2	62.8			3.5	53.0
Effective Green, g (s)	6.8	9.8	22.0	13.7	16.7	16.7	12.2	62.8			3.5	53.0
Actuated g/C Ratio	0.06	0.09	0.20	0.12	0.15	0.15	0.11	0.57			0.03	0.48
Clearance Time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7			4.6	5.7
Vehicle Extension (s)	2.5	3.0	2.5	2.5	3.0	3.0	2.5	3.5			2.5	3.5
Lane Grp Cap (vph)	109	165	313	220	282	235	380	2002			56	1666
v/s Ratio Prot	0.02	0.04	0.02	c0.08	c0.08		c0.08	0.27			0.02	c0.39
v/s Ratio Perm			0.02			0.01						
v/c Ratio	0.36	0.45	0.20	0.64	0.50	0.03	0.68	0.47			0.62	0.80
Uniform Delay, d1	49.5	47.5	36.6	45.8	42.8	39.8	47.0	13.8			52.6	24.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.81	1.57			1.00	1.00
Incremental Delay, d2	1.5	1.9	0.2	5.2	1.4	0.1	4.4	0.8			17.3	4.2
Delay (s)	51.0	49.5	36.9	51.0	44.2	39.8	42.6	22.4			69.9	28.3
Level of Service	D	D	D	D	D	D	D	C			E	C
Approach Delay (s)		41.5			46.3			26.8				29.4
Approach LOS		D			D			C				C

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	169
Future Volume (vph)	169
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	182
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	3
Confl. Bikes (#/hr)	
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

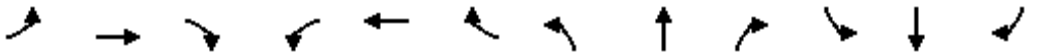
Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	47	13	58	77	73	10	14	208	1046	61	1	13
Future Volume (vph)	47	13	58	77	73	10	14	208	1046	61	1	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6			4.6	5.7			4.6
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00			1.00	0.91			1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00			1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00			1.00
Frt	1.00	1.00	0.85	1.00	0.98			1.00	0.99			1.00
Flt Protected	0.95	0.97	1.00	0.95	1.00			0.95	1.00			0.95
Satd. Flow (prot)	1681	1721	1562	1770	1828			1770	5034			1770
Flt Permitted	0.95	0.97	1.00	0.95	1.00			0.95	1.00			0.95
Satd. Flow (perm)	1681	1721	1562	1770	1828			1770	5034			1770
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	49	14	61	81	77	11	15	219	1101	64	1	14
RTOR Reduction (vph)	0	0	56	0	5	0	0	0	4	0	0	0
Lane Group Flow (vph)	31	32	5	81	83	0	0	234	1161	0	0	15
Confl. Peds. (#/hr)			1							5		
Turn Type	Split	NA	Perm	Split	NA		Prot	Prot	NA		Prot	Prot
Protected Phases	7	7		8	8		5	5	2		1	1
Permitted Phases			7									
Actuated Green, G (s)	9.9	9.9	9.9	9.4	9.4			17.3	69.3			1.9
Effective Green, g (s)	9.9	9.9	9.9	9.4	9.4			17.3	69.3			1.9
Actuated g/C Ratio	0.09	0.09	0.09	0.09	0.09			0.16	0.63			0.02
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6			4.6	5.7			4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			2.5	4.0			2.5
Lane Grp Cap (vph)	151	154	140	151	156			278	3171			30
v/s Ratio Prot	0.02	c0.02		c0.05	0.05			c0.13	0.23			0.01
v/s Ratio Perm			0.00									
v/c Ratio	0.21	0.21	0.04	0.54	0.53			0.84	0.37			0.50
Uniform Delay, d1	46.4	46.4	45.7	48.2	48.2			45.0	9.8			53.6
Progression Factor	1.00	1.00	1.00	1.00	1.00			0.90	0.50			1.36
Incremental Delay, d2	0.7	0.7	0.1	3.6	3.5			19.4	0.3			6.4
Delay (s)	47.1	47.1	45.8	51.8	51.7			59.8	5.3			79.1
Level of Service	D	D	D	D	D			E	A			E
Approach Delay (s)		46.5			51.8				14.4			
Approach LOS		D			D				B			

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

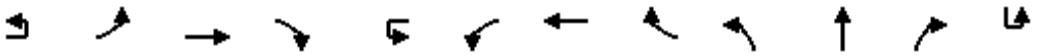
Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1182	231
Future Volume (vph)	1182	231
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.7	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.98	
Flt Protected	1.00	
Satd. Flow (prot)	4961	
Flt Permitted	1.00	
Satd. Flow (perm)	4961	
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	1244	243
RTOR Reduction (vph)	21	0
Lane Group Flow (vph)	1466	0
Confl. Peds. (#/hr)		
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	53.9	
Effective Green, g (s)	53.9	
Actuated g/C Ratio	0.49	
Clearance Time (s)	5.7	
Vehicle Extension (s)	4.0	
Lane Grp Cap (vph)	2430	
v/s Ratio Prot	c0.30	
v/s Ratio Perm		
v/c Ratio	0.60	
Uniform Delay, d1	20.3	
Progression Factor	0.36	
Incremental Delay, d2	0.8	
Delay (s)	8.1	
Level of Service	A	
Approach Delay (s)	8.8	
Approach LOS	A	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	27	0	0	83	12	1170	18	21	1345	5
Future Volume (vph)	0	0	27	0	0	83	12	1170	18	21	1345	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.86			0.86		1.00	1.00		1.00	1.00	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1611			1611		1770	5072		1770	5082	
Flt Permitted		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1611			1611		1770	5072		1770	5082	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	28	0	0	85	12	1194	18	21	1372	5
RTOR Reduction (vph)	0	25	0	0	76	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	3	0	0	9	0	12	1211	0	21	1377	0
Confl. Peds. (#/hr)									4			1
Turn Type		NA			NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		11.7			11.7		1.0	83.9		2.4	85.3	
Effective Green, g (s)		11.7			11.7		1.0	83.9		2.4	85.3	
Actuated g/C Ratio		0.11			0.11		0.01	0.76		0.02	0.78	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		171			171		16	3868		38	3940	
v/s Ratio Prot		0.00			c0.01		0.01	c0.24		0.01	c0.27	
v/s Ratio Perm												
v/c Ratio		0.02			0.05		0.75	0.31		0.55	0.35	
Uniform Delay, d1		44.0			44.2		54.4	4.1		53.3	3.8	
Progression Factor		1.00			1.00		1.00	1.00		0.55	0.07	
Incremental Delay, d2		0.0			0.1		106.0	0.2		13.9	0.2	
Delay (s)		44.0			44.3		160.4	4.3		42.9	0.5	
Level of Service		D			D		F	A		D	A	
Approach Delay (s)		44.0			44.3			5.8			1.1	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	37.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



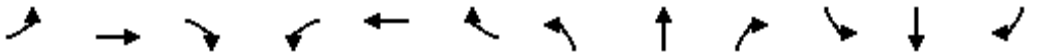
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	4	117	383	471	4	371	693	167	552	985	189	9
Future Volume (vph)	4	117	383	471	4	371	693	167	552	985	189	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	7.0	6.0		5.0	7.0	7.0	6.0	7.0	7.0	
Lane Util. Factor		0.97	0.91	1.00		0.97	0.91	1.00	0.97	0.91	1.00	
Frpb, ped/bikes		1.00	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98	
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)		3433	5085	1568		3433	5085	1555	3433	5085	1550	
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)		3433	5085	1568		3433	5085	1555	3433	5085	1550	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	4	126	412	506	4	399	745	180	594	1059	203	10
RTOR Reduction (vph)	0	0	0	79	0	0	0	108	0	0	109	0
Lane Group Flow (vph)	0	130	412	427	0	403	745	72	594	1059	94	0
Confl. Peds. (#/hr)				9				4			6	
Confl. Bikes (#/hr)				1				1				
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	Perm	Prot	NA	Perm	Prot
Protected Phases	5	5	2	3	1	1	6		3	8		7
Permitted Phases				2				6			8	
Actuated Green, G (s)		8.2	21.7	51.9		20.6	34.1	34.1	30.2	64.9	64.9	
Effective Green, g (s)		8.2	21.7	51.9		20.6	34.1	34.1	30.2	64.9	64.9	
Actuated g/C Ratio		0.06	0.15	0.37		0.15	0.24	0.24	0.22	0.46	0.46	
Clearance Time (s)		5.0	7.0	6.0		5.0	7.0	7.0	6.0	7.0	7.0	
Vehicle Extension (s)		3.0	5.0	3.0		3.0	5.0	5.0	3.0	4.0	4.0	
Lane Grp Cap (vph)		200	785	579		503	1235	377	738	2350	716	
v/s Ratio Prot		0.04	0.08	c0.16		c0.12	0.15		c0.17	0.21		
v/s Ratio Perm				0.11				0.05			0.06	
v/c Ratio		0.65	0.52	0.74		0.80	0.60	0.19	0.80	0.45	0.13	
Uniform Delay, d1		64.7	54.6	38.3		57.9	47.1	42.2	52.3	25.6	21.6	
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		7.3	1.2	4.9		8.9	1.2	0.5	6.4	0.2	0.1	
Delay (s)		72.0	55.8	43.2		66.8	48.4	42.7	58.7	25.8	21.7	
Level of Service		E	E	D		E	D	D	E	C	C	
Approach Delay (s)			51.7				53.2			35.9		
Approach LOS			D				D			D		

Intersection Summary			
HCM 2000 Control Delay	45.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	140.4	Sum of lost time (s)	25.0
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	94	1073	74
Future Volume (vph)	94	1073	74
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	5.0	7.0	7.0
Lane Util. Factor	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1547
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1547
Peak-hour factor, PHF	0.93	0.93	0.93
Adj. Flow (vph)	101	1154	80
RTOR Reduction (vph)	0	0	56
Lane Group Flow (vph)	111	1154	24
Confl. Peds. (#/hr)			8
Confl. Bikes (#/hr)			
Turn Type	Prot	NA	Perm
Protected Phases	7	4	
Permitted Phases			4
Actuated Green, G (s)	9.2	42.9	42.9
Effective Green, g (s)	9.2	42.9	42.9
Actuated g/C Ratio	0.07	0.31	0.31
Clearance Time (s)	5.0	7.0	7.0
Vehicle Extension (s)	3.0	4.0	4.0
Lane Grp Cap (vph)	224	1553	472
v/s Ratio Prot	0.03	c0.23	
v/s Ratio Perm			0.02
v/c Ratio	0.50	0.74	0.05
Uniform Delay, d1	63.4	43.8	34.4
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	1.7	2.1	0.1
Delay (s)	65.1	45.9	34.5
Level of Service	E	D	C
Approach Delay (s)		46.8	
Approach LOS		D	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	4	18	147	5	792	3	903	135	651	1373	12
Future Volume (vph)	11	4	18	147	5	792	3	903	135	651	1373	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95		0.97	0.95	
Frpb, ped/bikes		1.00	0.98		1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1793	1558		1770	2772	1770	3462		3433	3534	
Flt Permitted		0.80	1.00		0.72	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1492	1558		1338	2772	1770	3462		3433	3534	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	12	4	19	158	5	852	3	971	145	700	1476	13
RTOR Reduction (vph)	0	0	16	0	0	39	0	10	0	0	0	0
Lane Group Flow (vph)	0	16	3	0	163	813	3	1106	0	700	1489	0
Confl. Peds. (#/hr)	2		3	3		2			5			4
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		18.6	18.6		18.6	50.9	0.8	44.2		32.3	75.7	
Effective Green, g (s)		18.6	18.6		18.6	50.9	0.8	44.2		32.3	75.7	
Actuated g/C Ratio		0.17	0.17		0.17	0.46	0.01	0.40		0.29	0.69	
Clearance Time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.5		3.0	3.5	
Lane Grp Cap (vph)		252	263		226	1398	12	1391		1008	2432	
v/s Ratio Prot						0.17	0.00	c0.32		c0.20	0.42	
v/s Ratio Perm		0.01	0.00		c0.12	0.12						
v/c Ratio		0.06	0.01		0.72	0.58	0.25	0.79		0.69	0.61	
Uniform Delay, d1		38.4	38.1		43.2	21.7	54.3	28.9		34.5	9.2	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1	0.0		10.8	0.6	10.7	4.8		2.1	1.2	
Delay (s)		38.5	38.1		54.0	22.3	65.0	33.7		36.6	10.4	
Level of Service		D	D		D	C	E	C		D	B	
Approach Delay (s)		38.3			27.4			33.8			18.8	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	24	12	45	35	5	289	2	6	741	17	358	1170
Future Volume (vph)	24	12	45	35	5	289	2	6	741	17	358	1170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.2		5.0	4.2		4.2	5.3		4.2	5.3
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95
Frpb, ped/bikes		1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00
Frt		1.00	0.85		1.00	0.85		1.00	1.00		1.00	1.00
Flt Protected		0.97	1.00		0.96	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)		1803	1546		1777	1578		1770	3526		1770	3526
Flt Permitted		0.79	1.00		0.72	1.00		0.95	1.00		0.95	1.00
Satd. Flow (perm)		1465	1546		1341	1578		1770	3526		1770	3526
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	13	49	38	5	314	2	7	805	18	389	1272
RTOR Reduction (vph)	0	0	45	0	0	0	0	0	1	0	0	1
Lane Group Flow (vph)	0	39	4	0	43	314	0	9	822	0	389	1300
Confl. Peds. (#/hr)			3	3						1		
Confl. Bikes (#/hr)			3			1						
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	Prot	NA		Prot	NA
Protected Phases		4			8	1	5	5	2		1	6
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		10.1	10.1		9.3	38.0		0.8	58.3		28.7	86.2
Effective Green, g (s)		10.1	10.1		9.3	38.0		0.8	58.3		28.7	86.2
Actuated g/C Ratio		0.09	0.09		0.08	0.34		0.01	0.53		0.26	0.78
Clearance Time (s)		4.2	4.2		5.0	4.2		4.2	5.3		4.2	5.3
Vehicle Extension (s)		3.0	3.0		3.5	2.0		2.0	4.0		2.0	4.0
Lane Grp Cap (vph)		133	140		112	541		12	1855		458	2743
v/s Ratio Prot						c0.15		c0.01	0.23		c0.22	c0.37
v/s Ratio Perm		0.03	0.00		0.03	0.05						
v/c Ratio		0.29	0.03		0.38	0.58		0.75	0.44		0.85	0.47
Uniform Delay, d1		47.0	45.9		48.0	29.9		54.9	16.2		39.0	4.3
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		1.2	0.1		2.6	1.0		118.4	0.8		13.2	0.6
Delay (s)		48.2	46.0		50.6	30.9		173.3	17.0		52.2	4.9
Level of Service		D	D		D	C		F	B		D	A
Approach Delay (s)		47.0			33.3				18.7			15.8
Approach LOS		D			C				B			B

Intersection Summary			
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	110.8	Sum of lost time (s)	14.5
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	27
Future Volume (vph)	27
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	29
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Confl. Bikes (#/hr)	1
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	0	26	745	34	7	26	1246
Future Volume (Veh/h)	0	26	745	34	7	26	1246
Sign Control	Stop		Free				Free
Grade	0%		0%				0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	27	784	36	0	27	1312
Pedestrians	1		1				1
Lane Width (ft)	12.0		12.0				12.0
Walking Speed (ft/s)	4.0		4.0				4.0
Percent Blockage	0		0				0
Right turn flare (veh)							
Median type			None				None
Median storage veh)							
Upstream signal (ft)			354				
pX, platoon unblocked	0.94	0.94			0.00	0.94	
vC, conflicting volume	1514	412			0	821	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1423	253			0	688	
tC, single (s)	6.8	6.9			0.0	4.1	
tC, 2 stage (s)							
tF (s)	3.5	3.3			0.0	2.2	
p0 queue free %	100	96			0	97	
cM capacity (veh/h)	116	702			0	850	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	27	523	297	27	656	656
Volume Left	0	0	0	27	0	0
Volume Right	27	0	36	0	0	0
cSH	702	1700	1700	850	1700	1700
Volume to Capacity	0.04	0.31	0.17	0.03	0.39	0.39
Queue Length 95th (ft)	3	0	0	2	0	0
Control Delay (s)	10.3	0.0	0.0	9.4	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	10.3	0.0		0.2		
Approach LOS	B					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	44.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	76	107	3	22	696	1174	73
Future Volume (vph)	76	107	3	22	696	1174	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.2	6.5	6.5	
Lane Util. Factor	1.00			1.00	0.95	0.95	
Frpb, ped/bikes	1.00			1.00	1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	1.00	
Frt	0.92			1.00	1.00	0.99	
Flt Protected	0.98			0.95	1.00	1.00	
Satd. Flow (prot)	1681			1770	3539	3503	
Flt Permitted	0.98			0.95	1.00	1.00	
Satd. Flow (perm)	1681			1770	3539	3503	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	78	110	3	23	718	1210	75
RTOR Reduction (vph)	57	0	0	0	0	3	0
Lane Group Flow (vph)	131	0	0	26	718	1282	0
Confl. Peds. (#/hr)							2
Confl. Bikes (#/hr)							1
Turn Type	Prot		Prot	Prot	NA	NA	
Protected Phases	4		5	5	2	6	
Permitted Phases							
Actuated Green, G (s)	13.6			2.4	75.3	68.7	
Effective Green, g (s)	13.6			2.4	75.3	68.7	
Actuated g/C Ratio	0.14			0.02	0.75	0.69	
Clearance Time (s)	4.6			4.2	6.5	6.5	
Vehicle Extension (s)	3.0			3.0	4.0	4.0	
Lane Grp Cap (vph)	228			42	2664	2406	
v/s Ratio Prot	c0.08			c0.01	0.20	c0.37	
v/s Ratio Perm							
v/c Ratio	0.57			0.62	0.27	0.53	
Uniform Delay, d1	40.5			48.3	3.8	7.7	
Progression Factor	1.00			0.68	0.37	1.00	
Incremental Delay, d2	3.5			23.8	0.2	0.8	
Delay (s)	44.0			56.8	1.7	8.6	
Level of Service	D			E	A	A	
Approach Delay (s)	44.0				3.6	8.6	
Approach LOS	D				A	A	

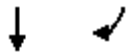
Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	54.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	18	17	58	16	22	37	4	33	667	8	2	24
Future Volume (vph)	18	17	58	16	22	37	4	33	667	8	2	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6			4.7	5.7			4.7
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95			1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00			1.00
Frt	1.00	0.88		1.00	0.91			1.00	1.00			1.00
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00			0.95
Satd. Flow (prot)	1767	1646		1770	1673			1770	3531			1770
Flt Permitted	0.72	1.00		0.70	1.00			0.95	1.00			0.95
Satd. Flow (perm)	1333	1646		1313	1673			1770	3531			1770
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	19	18	62	17	23	39	4	35	710	9	2	26
RTOR Reduction (vph)	0	57	0	0	36	0	0	0	1	0	0	0
Lane Group Flow (vph)	19	23	0	17	26	0	0	39	718	0	0	28
Confl. Peds. (#/hr)	1					1				2		
Confl. Bikes (#/hr)												
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8								
Actuated Green, G (s)	8.8	8.8		8.8	8.8			3.8	72.7			3.5
Effective Green, g (s)	8.8	8.8		8.8	8.8			3.8	72.7			3.5
Actuated g/C Ratio	0.09	0.09		0.09	0.09			0.04	0.73			0.04
Clearance Time (s)	4.6	4.6		4.6	4.6			4.7	5.7			4.7
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	4.0			3.0
Lane Grp Cap (vph)	117	144		115	147			67	2567			61
v/s Ratio Prot		0.01			c0.02			c0.02	0.20			0.02
v/s Ratio Perm	0.01			0.01								
v/c Ratio	0.16	0.16		0.15	0.18			0.58	0.28			0.46
Uniform Delay, d1	42.2	42.2		42.1	42.3			47.3	4.7			47.3
Progression Factor	1.00	1.00		1.00	1.00			1.16	0.33			0.89
Incremental Delay, d2	0.7	0.5		0.6	0.6			11.5	0.3			5.0
Delay (s)	42.8	42.7		42.7	42.8			66.5	1.8			47.0
Level of Service	D	D		D	D			E	A			D
Approach Delay (s)		42.7			42.8				5.1			
Approach LOS		D			D				A			

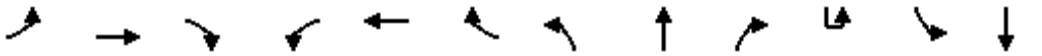
Intersection Summary			
HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1199	75
Future Volume (vph)	1199	75
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.7	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3504	
Flt Permitted	1.00	
Satd. Flow (perm)	3504	
Peak-hour factor, PHF	0.94	0.94
Adj. Flow (vph)	1276	80
RTOR Reduction (vph)	3	0
Lane Group Flow (vph)	1353	0
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		1
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	72.4	
Effective Green, g (s)	72.4	
Actuated g/C Ratio	0.72	
Clearance Time (s)	5.7	
Vehicle Extension (s)	4.0	
Lane Grp Cap (vph)	2536	
v/s Ratio Prot	c0.39	
v/s Ratio Perm		
v/c Ratio	0.53	
Uniform Delay, d1	6.2	
Progression Factor	0.42	
Incremental Delay, d2	0.7	
Delay (s)	3.4	
Level of Service	A	
Approach Delay (s)	4.2	
Approach LOS	A	

Intersection Summary



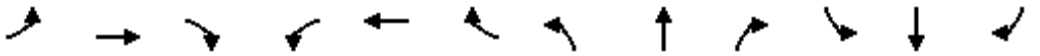
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	51	37	270	118	44	50	508	638	157	2	71	1043
Future Volume (vph)	51	37	270	118	44	50	508	638	157	2	71	1043
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0		4.6	5.7			4.6	6.7
Lane Util. Factor		1.00	1.00	1.00	1.00		0.97	0.91			1.00	0.91
Frpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	0.99			1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00			1.00	1.00
Frt		1.00	0.85	1.00	0.92		1.00	0.97			1.00	0.99
Flt Protected		0.97	1.00	0.95	1.00		0.95	1.00			0.95	1.00
Satd. Flow (prot)		1810	1583	1770	1714		3433	4909			1770	5002
Flt Permitted		0.97	1.00	0.95	1.00		0.95	1.00			0.95	1.00
Satd. Flow (perm)		1810	1583	1770	1714		3433	4909			1770	5002
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	59	43	314	137	51	58	591	742	183	2	83	1213
RTOR Reduction (vph)	0	0	107	0	39	0	0	35	0	0	0	11
Lane Group Flow (vph)	0	102	207	137	70	0	591	890	0	0	85	1331
Confl. Peds. (#/hr)			10						2			
Confl. Bikes (#/hr)												
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	Prot	NA
Protected Phases	4	4	4 5	3	3		5	2		1	1	6
Permitted Phases												
Actuated Green, G (s)		13.1	31.1	12.3	12.3		13.4	46.3			8.0	39.9
Effective Green, g (s)		13.1	26.5	12.3	12.3		13.4	46.3			8.0	39.9
Actuated g/C Ratio		0.13	0.26	0.12	0.12		0.13	0.46			0.08	0.40
Clearance Time (s)		5.0		5.0	5.0		4.6	5.7			4.6	6.7
Vehicle Extension (s)		3.0		3.0	3.0		3.0	4.0			3.0	4.0
Lane Grp Cap (vph)		237	419	217	210		460	2272			141	1995
v/s Ratio Prot		0.06	c0.13	c0.08	0.04		c0.17	0.18			0.05	c0.27
v/s Ratio Perm												
v/c Ratio		0.43	0.50	0.63	0.33		1.28	0.39			0.60	0.67
Uniform Delay, d1		40.0	31.1	41.7	40.1		43.3	17.6			44.5	24.6
Progression Factor		1.00	1.00	1.00	1.00		0.76	0.49			0.81	0.71
Incremental Delay, d2		1.3	0.9	5.9	0.9		143.3	0.5			6.4	1.6
Delay (s)		41.3	32.0	47.6	41.0		176.3	9.1			42.5	19.0
Level of Service		D	C	D	D		F	A			D	B
Approach Delay (s)		34.3			44.7			74.3				20.4
Approach LOS		C			D			E				C

Intersection Summary			
HCM 2000 Control Delay	46.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	111
Future Volume (vph)	111
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.86
Adj. Flow (vph)	129
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	4
Confl. Bikes (#/hr)	1
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

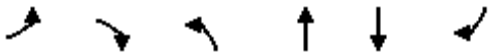
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	158	501	487	285	318	184	781	673	28	1354	65
Future Volume (vph)	45	158	501	487	285	318	184	781	673	28	1354	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	6.3	6.3	5.6	6.3	6.3	5.6	6.3	6.3	5.6	6.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	0.88	0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3539	1583	3433	3539	1561	3433	5085	2787	3433	5046	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	3539	1583	3433	3539	1561	3433	5085	2787	3433	5046	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	47	165	522	507	297	331	192	814	701	29	1410	68
RTOR Reduction (vph)	0	0	128	0	0	148	0	0	333	0	5	0
Lane Group Flow (vph)	47	165	394	507	297	183	192	814	368	29	1473	0
Confl. Peds. (#/hr)						1			10			3
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA	pt+ov	Prot	NA	Perm	Prot	NA	pt+ov	Prot	NA	
Protected Phases	7	4	4 5	3	8		5	2	2 3	1	6	
Permitted Phases						8						
Actuated Green, G (s)	3.0	20.7	25.9	17.1	34.8	34.8	5.2	35.4	58.1	3.0	33.2	
Effective Green, g (s)	3.0	20.7	25.9	17.1	34.8	34.8	5.2	35.4	52.5	3.0	33.2	
Actuated g/C Ratio	0.03	0.21	0.26	0.17	0.35	0.35	0.05	0.35	0.52	0.03	0.33	
Clearance Time (s)	5.6	6.3		5.6	6.3	6.3	5.6	6.3		5.6	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	102	732	409	587	1231	543	178	1800	1463	102	1675	
v/s Ratio Prot	0.01	0.05	c0.25	c0.15	0.08		c0.06	0.16	0.13	0.01	c0.29	
v/s Ratio Perm						0.12						
v/c Ratio	0.46	0.23	0.96	0.86	0.24	0.34	1.08	0.45	0.25	0.28	0.88	
Uniform Delay, d1	47.7	33.0	36.6	40.3	23.2	24.1	47.4	24.8	13.0	47.4	31.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.87	0.95	4.09	0.64	0.51	
Incremental Delay, d2	3.3	0.2	34.7	12.5	0.1	0.4	88.5	0.8	0.1	1.2	5.6	
Delay (s)	51.0	33.1	71.3	52.8	23.3	24.4	129.6	24.4	53.2	31.6	21.7	
Level of Service	D	C	E	D	C	C	F	C	D	C	C	
Approach Delay (s)		61.4			36.8			48.1			21.9	
Approach LOS		E			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	39.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	23.8
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	606	221	0	1035	1897	0
Future Volume (vph)	606	221	0	1035	1897	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		6.3	6.3	
Lane Util. Factor	0.97	1.00		0.86	0.81	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3433	1583		6408	7544	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3433	1583		6408	7544	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	638	233	0	1089	1997	0
RTOR Reduction (vph)	0	3	0	0	0	0
Lane Group Flow (vph)	638	230	0	1089	1997	0
Confl. Peds. (#/hr)						2
Confl. Bikes (#/hr)						1
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	23.6	23.6		64.5	64.5	
Effective Green, g (s)	23.6	23.6		64.5	64.5	
Actuated g/C Ratio	0.24	0.24		0.64	0.64	
Clearance Time (s)	5.6	5.6		6.3	6.3	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	810	373		4133	4865	
v/s Ratio Prot	c0.19			0.17	c0.26	
v/s Ratio Perm		0.15				
v/c Ratio	0.79	0.62		0.26	0.41	
Uniform Delay, d1	35.8	34.2		7.6	8.6	
Progression Factor	1.00	1.00		0.39	0.71	
Incremental Delay, d2	4.7	2.1		0.1	0.1	
Delay (s)	40.6	36.3		3.1	6.2	
Level of Service	D	D		A	A	
Approach Delay (s)	39.4			3.1	6.2	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

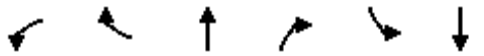
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	48	22	24	123	11	244	18	19	737	216	628	1404
Future Volume (vph)	48	22	24	123	11	244	18	19	737	216	628	1404
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		4.2	5.6	5.6		5.2	5.3	5.3	5.2	5.3
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	0.91	1.00	0.97	0.91
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00		1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.92		1.00	1.00	0.85		1.00	1.00	0.85	1.00	0.99
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1701		1770	1863	1583		1770	5085	1549	3433	5037
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1701		1770	1863	1583		1770	5085	1549	3433	5037
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	52	24	26	132	12	262	19	20	792	232	675	1510
RTOR Reduction (vph)	0	23	0	0	0	95	0	0	0	141	0	5
Lane Group Flow (vph)	52	27	0	132	12	167	0	39	792	91	675	1590
Confl. Peds. (#/hr)			6							6		
Confl. Bikes (#/hr)										1		
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	8	8 1	5	5	2		1	6
Permitted Phases										2		
Actuated Green, G (s)	11.0	9.7		12.6	9.9	34.0		3.1	33.3	33.3	24.1	54.3
Effective Green, g (s)	11.0	9.7		12.6	9.9	34.0		3.1	33.3	33.3	24.1	54.3
Actuated g/C Ratio	0.11	0.10		0.13	0.10	0.34		0.03	0.33	0.33	0.24	0.54
Clearance Time (s)	5.6	5.6		4.2	5.6			5.2	5.3	5.3	5.2	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	2.0	2.0	3.0	2.0
Lane Grp Cap (vph)	194	164		223	184	538		54	1693	515	827	2735
v/s Ratio Prot	0.03	0.02		c0.07	0.01	c0.11		0.02	c0.16		c0.20	c0.32
v/s Ratio Perm										0.06		
v/c Ratio	0.27	0.16		0.59	0.07	0.31		0.72	0.47	0.18	0.82	0.58
Uniform Delay, d1	40.8	41.4		41.3	40.9	24.3		48.0	26.3	23.6	35.9	15.3
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	0.97	0.38
Incremental Delay, d2	0.7	0.5		4.2	0.2	0.3		37.8	0.9	0.7	5.9	0.8
Delay (s)	41.6	41.9		45.4	41.0	24.7		85.8	27.3	24.4	40.6	6.6
Level of Service	D	D		D	D	C		F	C	C	D	A
Approach Delay (s)		41.7			31.9				28.8			16.7
Approach LOS		D			C				C			B

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	21.7
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	79
Future Volume (vph)	79
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	85
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	2
Confl. Bikes (#/hr)	1
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

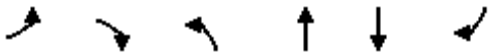
Intersection Summary



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	660	0	0	1394
Future Volume (Veh/h)	0	0	660	0	0	1394
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	717	0	0	1515
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			1231			888
pX, platoon unblocked	0.86					
vC, conflicting volume	1474	358			717	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1234	358			717	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	146	638			880	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	0	478	239	0	758	758
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.28	0.14	0.00	0.45	0.45
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	0.0	0.0		0.0		
Approach LOS	A					

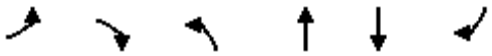
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	18	660	1394	0
Future Volume (Veh/h)	0	0	18	660	1394	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	20	717	1515	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1133	986	
pX, platoon unblocked	0.86	0.86	0.86			
vC, conflicting volume	1914	758	1515			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1742	403	1281			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	96			
cM capacity (veh/h)	64	515	464			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	0	20	358	358	1010	505
Volume Left	0	20	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	464	1700	1700	1700	1700
Volume to Capacity	0.00	0.04	0.21	0.21	0.59	0.30
Queue Length 95th (ft)	0	3	0	0	0	0
Control Delay (s)	0.0	13.1	0.0	0.0	0.0	0.0
Lane LOS	A	B				
Approach Delay (s)	0.0	0.4			0.0	
Approach LOS	A					

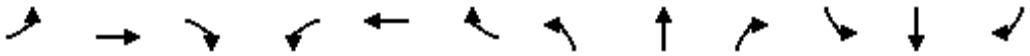
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	49	11	863	1570	0
Future Volume (Veh/h)	0	49	11	863	1570	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	53	12	938	1707	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1116	902	
pX, platoon unblocked	0.81	0.75	0.75			
vC, conflicting volume	2200	854	1707			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1404	155	1286			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	92	97			
cM capacity (veh/h)	102	651	404			

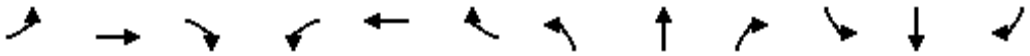
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	53	12	469	469	1138	569
Volume Left	0	12	0	0	0	0
Volume Right	53	0	0	0	0	0
cSH	651	404	1700	1700	1700	1700
Volume to Capacity	0.08	0.03	0.28	0.28	0.67	0.33
Queue Length 95th (ft)	7	2	0	0	0	0
Control Delay (s)	11.0	14.2	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	11.0	0.2			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	28	0	1397	0	0	1981	51
Future Volume (vph)	0	0	0	0	0	28	0	1397	0	0	1981	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					1.00			0.91			0.91	
Frt					0.86			1.00			1.00	
Flt Protected					1.00			1.00			1.00	
Satd. Flow (prot)					1611			5085			5066	
Flt Permitted					1.00			1.00			1.00	
Satd. Flow (perm)					1611			5085			5066	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	30	0	1518	0	0	2153	55
RTOR Reduction (vph)	0	0	0	0	26	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	4	0	0	1518	0	0	2208	0
Turn Type					NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases												
Actuated Green, G (s)					86.0			506.0			506.0	
Effective Green, g (s)					86.0			506.0			506.0	
Actuated g/C Ratio					0.14			0.84			0.84	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					230			4288			4272	
v/s Ratio Prot					c0.00			0.30			c0.44	
v/s Ratio Perm												
v/c Ratio					0.02			0.35			0.52	
Uniform Delay, d1					220.8			10.5			13.1	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					0.1			0.2			0.4	
Delay (s)					220.9			10.7			13.5	
Level of Service					F			B			B	
Approach Delay (s)		0.0			220.9			10.7			13.5	
Approach LOS		A			F			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	600.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	954	5	0	1412	44
Future Volume (Veh/h)	0	0	0	0	0	0	0	954	5	0	1412	44
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0	0	1037	5	0	1535	48
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								654			753	
pX, platoon unblocked	0.92	0.92	0.92	0.92	0.92	0.88	0.92			0.88		
vC, conflicting volume	1905	2601	536	1551	2622	348	1583			1042		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1119	1873	201	736	1896	0	1337			589		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	100	100			100		
cM capacity (veh/h)	149	66	744	284	63	959	472			869		

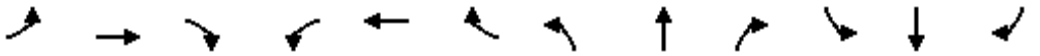
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	415	415	212	614	614	355
Volume Left	0	0	0	0	0	0
Volume Right	0	0	5	0	0	48
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.24	0.24	0.12	0.36	0.36	0.21
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	31.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	123	282	77	80	35	327	1239	133	39	739	60
Future Volume (vph)	135	123	282	77	80	35	327	1239	133	39	739	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7		4.6	5.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1572	1770	1863	1583	3433	3480		1770	3495	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1572	1770	1863	1583	3433	3480		1770	3495	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	141	128	294	80	83	36	341	1291	139	41	770	62
RTOR Reduction (vph)	0	0	108	0	0	32	0	5	0	0	4	0
Lane Group Flow (vph)	141	128	186	80	83	4	341	1425	0	41	829	0
Confl. Peds. (#/hr)			1									2
Confl. Bikes (#/hr)									2			2
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	14.2	18.2	36.8	9.0	13.0	13.0	18.6	76.0		6.6	62.9	
Effective Green, g (s)	14.2	18.2	36.8	9.0	13.0	13.0	18.6	76.0		6.6	62.9	
Actuated g/C Ratio	0.11	0.14	0.28	0.07	0.10	0.10	0.14	0.58		0.05	0.48	
Clearance Time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7		4.6	5.7	
Vehicle Extension (s)	2.5	3.0	2.5	2.5	3.0	3.0	2.5	3.5		2.5	3.5	
Lane Grp Cap (vph)	193	260	444	122	186	158	491	2034		89	1691	
v/s Ratio Prot	c0.08	c0.07	0.06	0.05	0.04		0.10	c0.41		0.02	c0.24	
v/s Ratio Perm			0.06			0.00						
v/c Ratio	0.73	0.49	0.42	0.66	0.45	0.02	0.69	0.70		0.46	0.49	
Uniform Delay, d1	56.0	51.6	37.9	59.0	55.1	52.8	53.0	19.0		60.0	22.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.72	0.31		1.00	1.00	
Incremental Delay, d2	12.6	1.5	0.5	10.8	1.7	0.1	3.5	1.8		2.7	1.0	
Delay (s)	68.6	53.1	38.4	69.8	56.8	52.8	41.5	7.7		62.7	23.7	
Level of Service	E	D	D	E	E	D	D	A		E	C	
Approach Delay (s)		49.3			61.3			14.2			25.5	
Approach LOS		D			E			B			C	

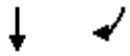
Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	113	63	130	61	22	5	33	86	1570	144	2	11
Future Volume (vph)	113	63	130	61	22	5	33	86	1570	144	2	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6			4.6	5.7			4.6
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00			1.00	0.91			1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00			1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00			1.00
Frt	1.00	1.00	0.85	1.00	0.97			1.00	0.99			1.00
Flt Protected	0.95	0.99	1.00	0.95	1.00			0.95	1.00			0.95
Satd. Flow (prot)	1681	1744	1550	1770	1813			1770	5012			1770
Flt Permitted	0.95	0.99	1.00	0.95	1.00			0.95	1.00			0.95
Satd. Flow (perm)	1681	1744	1550	1770	1813			1770	5012			1770
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	118	66	135	64	23	5	34	90	1635	150	2	11
RTOR Reduction (vph)	0	0	120	0	5	0	0	0	5	0	0	0
Lane Group Flow (vph)	91	93	15	64	23	0	0	124	1780	0	0	13
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			1							2		
Turn Type	Split	NA	Perm	Split	NA		Prot	Prot	NA		Prot	Prot
Protected Phases	7	7		8	8		5	5	2		1	1
Permitted Phases			7									
Actuated Green, G (s)	14.3	14.3	14.3	8.8	8.8			16.6	85.6			1.8
Effective Green, g (s)	14.3	14.3	14.3	8.8	8.8			16.6	85.6			1.8
Actuated g/C Ratio	0.11	0.11	0.11	0.07	0.07			0.13	0.66			0.01
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6			4.6	5.7			4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			2.5	4.0			2.5
Lane Grp Cap (vph)	184	191	170	119	122			226	3300			24
v/s Ratio Prot	c0.05	0.05		c0.04	0.01			c0.07	c0.36			0.01
v/s Ratio Perm			0.01									
v/c Ratio	0.49	0.49	0.09	0.54	0.19			0.55	0.54			0.54
Uniform Delay, d1	54.4	54.4	52.0	58.6	57.2			53.2	11.8			63.7
Progression Factor	1.00	1.00	1.00	1.00	1.00			0.91	0.16			0.86
Incremental Delay, d2	2.1	2.0	0.2	4.6	0.8			2.0	0.6			16.2
Delay (s)	56.5	56.4	52.2	63.2	58.0			50.5	2.5			71.2
Level of Service	E	E	D	E	E			D	A			E
Approach Delay (s)		54.7			61.7				5.6			
Approach LOS		D			E				A			

Intersection Summary			
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1028	45
Future Volume (vph)	1028	45
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.7	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	5049	
Flt Permitted	1.00	
Satd. Flow (perm)	5049	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	1071	47
RTOR Reduction (vph)	3	0
Lane Group Flow (vph)	1115	0
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		2
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	70.8	
Effective Green, g (s)	70.8	
Actuated g/C Ratio	0.54	
Clearance Time (s)	5.7	
Vehicle Extension (s)	4.0	
Lane Grp Cap (vph)	2749	
v/s Ratio Prot	0.22	
v/s Ratio Perm		
v/c Ratio	0.41	
Uniform Delay, d1	17.3	
Progression Factor	0.65	
Incremental Delay, d2	0.4	
Delay (s)	11.6	
Level of Service	B	
Approach Delay (s)	12.3	
Approach LOS	B	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	0	0	25	0	0	63	27	1750	30	1	24	1213
Future Volume (vph)	0	0	25	0	0	63	27	1750	30	1	24	1213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0			4.0	4.0
Lane Util. Factor		1.00			1.00		1.00	0.91			1.00	0.91
Frpb, ped/bikes		0.98			0.97		1.00	1.00			1.00	1.00
Flpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	1.00
Frt		0.86			0.86		1.00	1.00			1.00	1.00
Flt Protected		1.00			1.00		0.95	1.00			0.95	1.00
Satd. Flow (prot)		1573			1567		1770	5065			1770	5076
Flt Permitted		1.00			1.00		0.95	1.00			0.95	1.00
Satd. Flow (perm)		1573			1567		1770	5065			1770	5076
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	27	0	0	67	29	1862	32	1	26	1290
RTOR Reduction (vph)	0	25	0	0	61	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	2	0	0	6	0	29	1893	0	0	27	1302
Confl. Peds. (#/hr)			13			17	13		21		17	
Confl. Bikes (#/hr)									4			
Turn Type		NA			NA		Prot	NA		Prot	Prot	NA
Protected Phases		4			8		5	2		1	1	6
Permitted Phases	4			8								
Actuated Green, G (s)		11.9			11.9		4.8	101.9			4.2	101.3
Effective Green, g (s)		11.9			11.9		4.8	101.9			4.2	101.3
Actuated g/C Ratio		0.09			0.09		0.04	0.78			0.03	0.78
Clearance Time (s)		4.0			4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		143			143		65	3970			57	3955
v/s Ratio Prot		0.00			c0.00		0.02	c0.37			0.02	c0.26
v/s Ratio Perm												
v/c Ratio		0.02			0.04		0.45	0.48			0.47	0.33
Uniform Delay, d1		53.7			53.9		61.3	4.9			61.8	4.3
Progression Factor		1.00			1.00		1.20	0.61			0.69	0.24
Incremental Delay, d2		0.0			0.1		3.7	0.3			5.8	0.2
Delay (s)		53.8			54.0		77.4	3.3			48.5	1.2
Level of Service		D			D		E	A			D	A
Approach Delay (s)		53.8			54.0			4.4				2.2
Approach LOS		D			D			A				A

Intersection Summary			
HCM 2000 Control Delay	4.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	11
Future Volume (vph)	11
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	12
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	9
Confl. Bikes (#/hr)	1
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

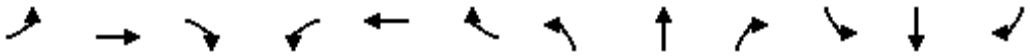
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	8	246	801	582	16	264	571	261	385	1280	233	35
Future Volume (vph)	8	246	801	582	16	264	571	261	385	1280	233	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	7.0	6.0		5.0	7.0	7.0	6.0	7.0	7.0	
Lane Util. Factor		0.97	0.91	1.00		0.97	0.91	1.00	0.97	0.91	1.00	
Frpb, ped/bikes		1.00	1.00	0.99		1.00	1.00	0.97	1.00	1.00	0.98	
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)		3433	5085	1560		3433	5085	1533	3433	5085	1547	
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)		3433	5085	1560		3433	5085	1533	3433	5085	1547	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	8	254	826	600	16	272	589	269	397	1320	240	36
RTOR Reduction (vph)	0	0	0	68	0	0	0	133	0	0	153	0
Lane Group Flow (vph)	0	262	826	532	0	288	589	136	397	1320	87	0
Confl. Peds. (#/hr)				11				18			8	
Confl. Bikes (#/hr)				2								
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	Perm	Prot	NA	Perm	Prot
Protected Phases	5	5	2	3	1	1	6		3	8		7
Permitted Phases				2				6			8	
Actuated Green, G (s)		13.9	30.9	54.9		14.9	31.9	31.9	24.0	45.9	45.9	
Effective Green, g (s)		13.9	30.9	54.9		14.9	31.9	31.9	24.0	45.9	45.9	
Actuated g/C Ratio		0.11	0.24	0.42		0.11	0.25	0.25	0.18	0.35	0.35	
Clearance Time (s)		5.0	7.0	6.0		5.0	7.0	7.0	6.0	7.0	7.0	
Vehicle Extension (s)		3.0	5.0	3.0		3.0	5.0	5.0	3.0	4.0	4.0	
Lane Grp Cap (vph)		367	1208	658		393	1247	376	633	1795	546	
v/s Ratio Prot		0.08	0.16	c0.15		c0.08	0.12		0.12	c0.26		
v/s Ratio Perm				0.19				0.09			0.06	
v/c Ratio		0.71	0.68	0.81		0.73	0.47	0.36	0.63	0.74	0.16	
Uniform Delay, d1		56.1	45.1	33.0		55.6	41.9	40.6	48.9	36.7	28.8	
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		6.5	2.1	7.3		6.9	0.6	1.2	1.9	2.7	0.6	
Delay (s)		62.6	47.2	40.2		62.5	42.5	41.9	50.8	39.5	29.4	
Level of Service		E	D	D		E	D	D	D	D	C	
Approach Delay (s)			47.1				47.4			40.5		
Approach LOS			D				D			D		

Intersection Summary			
HCM 2000 Control Delay	42.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	252	853	111
Future Volume (vph)	252	853	111
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	5.0	7.0	7.0
Lane Util. Factor	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1528
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1528
Peak-hour factor, PHF	0.97	0.97	0.97
Adj. Flow (vph)	260	879	114
RTOR Reduction (vph)	0	0	83
Lane Group Flow (vph)	296	879	31
Confl. Peds. (#/hr)			18
Confl. Bikes (#/hr)			
Turn Type	Prot	NA	Perm
Protected Phases	7	4	
Permitted Phases			4
Actuated Green, G (s)	14.3	35.2	35.2
Effective Green, g (s)	14.3	35.2	35.2
Actuated g/C Ratio	0.11	0.27	0.27
Clearance Time (s)	5.0	7.0	7.0
Vehicle Extension (s)	3.0	4.0	4.0
Lane Grp Cap (vph)	377	1376	413
v/s Ratio Prot	c0.09	0.17	
v/s Ratio Perm			0.02
v/c Ratio	0.79	0.64	0.07
Uniform Delay, d1	56.4	41.8	35.3
Progression Factor	0.71	0.66	1.48
Incremental Delay, d2	10.0	2.2	0.3
Delay (s)	49.9	29.7	52.4
Level of Service	D	C	D
Approach Delay (s)		36.4	
Approach LOS		D	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	10	4	68	6	518	12	1446	153	764	1077	22
Future Volume (vph)	12	10	4	68	6	518	12	1446	153	764	1077	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95		0.97	0.95	
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.97	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1807	1549		1776	2773	1770	3482		3433	3525	
Flt Permitted		0.83	1.00		0.73	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1545	1549		1349	2773	1770	3482		3433	3525	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	12	10	4	71	6	540	12	1506	159	796	1122	23
RTOR Reduction (vph)	0	0	4	0	0	40	0	5	0	0	1	0
Lane Group Flow (vph)	0	23	0	0	77	500	13	1660	0	796	1144	0
Confl. Peds. (#/hr)	3		2	2		3			5			8
Confl. Bikes (#/hr)			3									3
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		12.8	12.8		12.8	44.0	2.1	71.1		31.2	100.2	
Effective Green, g (s)		12.8	12.8		12.8	44.0	2.1	71.1		31.2	100.2	
Actuated g/C Ratio		0.10	0.10		0.10	0.34	0.02	0.55		0.24	0.77	
Clearance Time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.5		3.0	3.5	
Lane Grp Cap (vph)		152	152		132	1036	28	1904		823	2716	
v/s Ratio Prot						0.12	0.01	c0.48		c0.23	0.32	
v/s Ratio Perm		0.01	0.00		c0.06	0.06						
v/c Ratio		0.15	0.00		0.58	0.48	0.46	0.87		0.97	0.42	
Uniform Delay, d1		53.6	52.8		56.0	34.0	63.4	25.5		48.9	5.1	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.5	0.0		6.4	0.4	11.7	5.8		23.4	0.5	
Delay (s)		54.1	52.9		62.5	34.4	75.1	31.3		72.3	5.5	
Level of Service		D	D		E	C	E	C		E	A	
Approach Delay (s)		53.9			37.9			31.7			32.9	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	28	19	14	42	28	300	6	40	1339	49	255	858
Future Volume (vph)	28	19	14	42	28	300	6	40	1339	49	255	858
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.2		5.0	4.2		4.2	5.3		4.2	5.3
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95
Frpb, ped/bikes		1.00	0.97		1.00	0.99		1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00
Frt		1.00	0.85		1.00	0.85		1.00	0.99		1.00	0.99
Flt Protected		0.97	1.00		0.97	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)		1800	1540		1805	1573		1770	3517		1770	3514
Flt Permitted		0.79	1.00		0.79	1.00		0.95	1.00		0.95	1.00
Satd. Flow (perm)		1460	1540		1463	1573		1770	3517		1770	3514
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	30	20	15	45	30	319	6	43	1424	52	271	913
RTOR Reduction (vph)	0	0	14	0	0	0	0	0	2	0	0	2
Lane Group Flow (vph)	0	50	1	0	75	319	0	49	1474	0	271	957
Confl. Peds. (#/hr)	4		5	2		4				2		
Confl. Bikes (#/hr)			3							1		
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	Prot	NA		Prot	NA
Protected Phases		4			8	1	5	5	2		1	6
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		12.4	12.4		11.6	36.2		6.2	79.8		24.6	98.2
Effective Green, g (s)		12.4	12.4		11.6	36.2		6.2	79.8		24.6	98.2
Actuated g/C Ratio		0.10	0.10		0.09	0.28		0.05	0.61		0.19	0.75
Clearance Time (s)		4.2	4.2		5.0	4.2		4.2	5.3		4.2	5.3
Vehicle Extension (s)		3.0	3.0		3.5	2.0		2.0	4.0		2.0	4.0
Lane Grp Cap (vph)		138	146		130	436		84	2150		333	2644
v/s Ratio Prot						c0.14		0.03	c0.42		c0.15	0.27
v/s Ratio Perm		0.03	0.00		0.05	0.06						
v/c Ratio		0.36	0.01		0.58	0.73		0.58	0.69		0.81	0.36
Uniform Delay, d1		55.3	53.5		57.1	42.7		60.9	17.0		50.8	5.5
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		1.6	0.0		6.5	5.4		6.5	1.8		13.4	0.4
Delay (s)		57.0	53.5		63.6	48.1		67.4	18.8		64.2	5.9
Level of Service		E	D		E	D		E	B		E	A
Approach Delay (s)		56.2			51.1				20.3			18.7
Approach LOS		E			D				C			B

Intersection Summary			
HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	130.5	Sum of lost time (s)	14.5
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	43
Future Volume (vph)	43
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	46
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	0	14	1481	60	5	14	915
Future Volume (Veh/h)	0	14	1481	60	5	14	915
Sign Control	Stop		Free				Free
Grade	0%		0%				0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	15	1592	65	0	15	984
Pedestrians	5						4
Lane Width (ft)	12.0						12.0
Walking Speed (ft/s)	4.0						4.0
Percent Blockage	0						0
Right turn flare (veh)							
Median type			None				None
Median storage veh)							
Upstream signal (ft)			350				
pX, platoon unblocked	0.83	0.83			0.00	0.83	
vC, conflicting volume	2152	838			0	1662	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1978	395			0	1388	
tC, single (s)	6.8	6.9			0.0	4.1	
tC, 2 stage (s)							
tF (s)	3.5	3.3			0.0	2.2	
p0 queue free %	100	97			0	96	
cM capacity (veh/h)	43	498			0	404	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	15	1061	596	15	492	492
Volume Left	0	0	0	15	0	0
Volume Right	15	0	65	0	0	0
cSH	498	1700	1700	404	1700	1700
Volume to Capacity	0.03	0.62	0.35	0.04	0.29	0.29
Queue Length 95th (ft)	2	0	0	3	0	0
Control Delay (s)	12.5	0.0	0.0	14.2	0.0	0.0
Lane LOS	B			B		
Approach Delay (s)	12.5	0.0		0.2		
Approach LOS	B					

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	53	68	1	83	1501	851	64
Future Volume (vph)	53	68	1	83	1501	851	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.2	6.5	6.5	
Lane Util. Factor	1.00			1.00	0.95	0.95	
Frpb, ped/bikes	1.00			1.00	1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	1.00	
Frt	0.92			1.00	1.00	0.99	
Flt Protected	0.98			0.95	1.00	1.00	
Satd. Flow (prot)	1685			1770	3539	3495	
Flt Permitted	0.98			0.95	1.00	1.00	
Satd. Flow (perm)	1685			1770	3539	3495	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	57	73	1	89	1614	915	69
RTOR Reduction (vph)	49	0	0	0	0	3	0
Lane Group Flow (vph)	81	0	0	90	1614	981	0
Confl. Peds. (#/hr)							3
Confl. Bikes (#/hr)							2
Turn Type	Prot		Prot	Prot	NA	NA	
Protected Phases	4		5	5	2	6	
Permitted Phases							
Actuated Green, G (s)	12.0			13.4	86.9	69.3	
Effective Green, g (s)	12.0			13.4	86.9	69.3	
Actuated g/C Ratio	0.11			0.12	0.79	0.63	
Clearance Time (s)	4.6			4.2	6.5	6.5	
Vehicle Extension (s)	3.0			3.0	4.0	4.0	
Lane Grp Cap (vph)	183			215	2795	2201	
v/s Ratio Prot	c0.05			0.05	c0.46	0.28	
v/s Ratio Perm							
v/c Ratio	0.44			0.42	0.58	0.45	
Uniform Delay, d1	45.9			44.7	4.5	10.5	
Progression Factor	1.00			0.73	0.25	1.00	
Incremental Delay, d2	1.7			1.2	0.8	0.7	
Delay (s)	47.6			33.9	1.9	11.1	
Level of Service	D			C	A	B	
Approach Delay (s)	47.6				3.6	11.1	
Approach LOS	D				A	B	

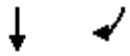
Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	15	11	41	27	22	27	2	92	1524	46	4	28
Future Volume (vph)	15	11	41	27	22	27	2	92	1524	46	4	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6			4.7	5.7			4.7
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95			1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00			1.00
Frt	1.00	0.88		1.00	0.92			1.00	1.00			1.00
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00			0.95
Satd. Flow (prot)	1770	1642		1770	1694			1770	3521			1770
Flt Permitted	0.72	1.00		0.72	1.00			0.95	1.00			0.95
Satd. Flow (perm)	1345	1642		1341	1694			1770	3521			1770
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	16	12	45	30	24	30	2	101	1675	51	4	31
RTOR Reduction (vph)	0	41	0	0	27	0	0	0	1	0	0	0
Lane Group Flow (vph)	16	16	0	30	27	0	0	103	1725	0	0	35
Confl. Peds. (#/hr)										2		
Confl. Bikes (#/hr)						1				1		
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8								
Actuated Green, G (s)	9.3	9.3		9.3	9.3			10.8	81.3			4.4
Effective Green, g (s)	9.3	9.3		9.3	9.3			10.8	81.3			4.4
Actuated g/C Ratio	0.08	0.08		0.08	0.08			0.10	0.74			0.04
Clearance Time (s)	4.6	4.6		4.6	4.6			4.7	5.7			4.7
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	4.0			3.0
Lane Grp Cap (vph)	113	138		113	143			173	2602			70
v/s Ratio Prot		0.01			0.02			0.06	c0.49			0.02
v/s Ratio Perm	0.01			c0.02								
v/c Ratio	0.14	0.11		0.27	0.19			0.60	0.66			0.50
Uniform Delay, d1	46.7	46.5		47.2	46.8			47.5	7.3			51.7
Progression Factor	1.00	1.00		1.00	1.00			1.43	0.41			0.75
Incremental Delay, d2	0.6	0.4		1.3	0.6			4.4	1.1			5.2
Delay (s)	47.2	46.9		48.4	47.5			72.4	4.1			44.0
Level of Service	D	D		D	D			E	A			D
Approach Delay (s)		47.0			47.8				8.0			
Approach LOS		D			D				A			

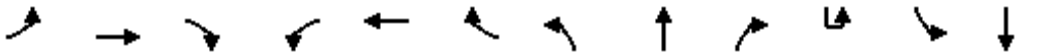
Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	855	26
Future Volume (vph)	855	26
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.7	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	3520	
Flt Permitted	1.00	
Satd. Flow (perm)	3520	
Peak-hour factor, PHF	0.91	0.91
Adj. Flow (vph)	940	29
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	968	0
Confl. Peds. (#/hr)		3
Confl. Bikes (#/hr)		2
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	74.9	
Effective Green, g (s)	74.9	
Actuated g/C Ratio	0.68	
Clearance Time (s)	5.7	
Vehicle Extension (s)	4.0	
Lane Grp Cap (vph)	2396	
v/s Ratio Prot	c0.27	
v/s Ratio Perm		
v/c Ratio	0.40	
Uniform Delay, d1	7.7	
Progression Factor	0.19	
Incremental Delay, d2	0.5	
Delay (s)	1.9	
Level of Service	A	
Approach Delay (s)	3.4	
Approach LOS	A	

Intersection Summary



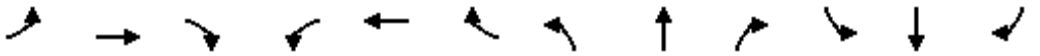
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	118	40	400	109	57	78	385	1452	215	1	39	782
Future Volume (vph)	118	40	400	109	57	78	385	1452	215	1	39	782
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0		4.6	5.7			4.6	6.7
Lane Util. Factor		1.00	1.00	1.00	1.00		0.97	0.91			1.00	0.91
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00			1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00			1.00	1.00
Frt		1.00	0.85	1.00	0.91		1.00	0.98			1.00	0.99
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00			0.95	1.00
Satd. Flow (prot)		1796	1583	1770	1687		3433	4969			1770	4995
Flt Permitted		0.96	1.00	0.95	1.00		0.95	1.00			0.95	1.00
Satd. Flow (perm)		1796	1583	1770	1687		3433	4969			1770	4995
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	123	42	417	114	59	81	401	1512	224	1	41	815
RTOR Reduction (vph)	0	0	99	0	46	0	0	14	0	0	0	11
Lane Group Flow (vph)	0	165	318	114	94	0	401	1723	0	0	42	894
Confl. Peds. (#/hr)			17						2			
Confl. Bikes (#/hr)						1			1			
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	Prot	NA
Protected Phases	4	4	4 5	3	3		5	2		1	1	6
Permitted Phases												
Actuated Green, G (s)		16.7	37.0	11.9	11.9		20.3	56.2			4.9	39.8
Effective Green, g (s)		16.7	37.0	11.9	11.9		20.3	56.2			4.9	39.8
Actuated g/C Ratio		0.15	0.34	0.11	0.11		0.18	0.51			0.04	0.36
Clearance Time (s)		5.0		5.0	5.0		4.6	5.7			4.6	6.7
Vehicle Extension (s)		3.0		3.0	3.0		3.0	4.0			3.0	4.0
Lane Grp Cap (vph)		272	532	191	182		633	2538			78	1807
v/s Ratio Prot		c0.09	0.20	c0.06	0.06		0.12	c0.35			0.02	c0.18
v/s Ratio Perm												
v/c Ratio		0.61	0.60	0.60	0.51		0.63	0.68			0.54	0.49
Uniform Delay, d1		43.6	30.3	46.8	46.3		41.4	20.1			51.4	27.3
Progression Factor		1.00	1.00	1.00	1.00		0.62	0.36			0.75	0.66
Incremental Delay, d2		3.8	1.8	4.9	2.4		1.4	1.0			6.6	0.9
Delay (s)		47.4	32.1	51.7	48.8		27.1	8.3			45.3	18.9
Level of Service		D	C	D	D		C	A			D	B
Approach Delay (s)		36.5			50.1			11.8				20.1
Approach LOS		D			D			B				C

Intersection Summary			
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	86
Future Volume (vph)	86
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.96
Adj. Flow (vph)	90
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	8
Confl. Bikes (#/hr)	1
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

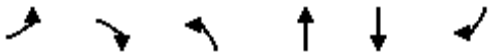
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	184	441	474	394	416	340	1550	622	32	1172	82
Future Volume (vph)	90	184	441	474	394	416	340	1550	622	32	1172	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	6.3	6.3	5.6	6.3	6.3	5.6	6.3	6.3	5.6	6.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	0.88	0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3539	1583	3433	3539	1560	3433	5085	2787	3433	5031	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	3539	1583	3433	3539	1560	3433	5085	2787	3433	5031	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	93	190	455	489	406	429	351	1598	641	33	1208	85
RTOR Reduction (vph)	0	0	67	0	0	138	0	0	193	0	7	0
Lane Group Flow (vph)	93	190	388	489	406	291	351	1598	448	33	1286	0
Confl. Peds. (#/hr)						2			12			
Confl. Bikes (#/hr)												2
Turn Type	Prot	NA	pt+ov	Prot	NA	Perm	Prot	NA	pt+ov	Prot	NA	
Protected Phases	7	4	4 5	3	8		5	2	2 3	1	6	
Permitted Phases						8						
Actuated Green, G (s)	5.9	19.5	32.2	20.3	33.9	33.9	12.7	43.4	63.7	3.0	33.7	
Effective Green, g (s)	5.9	19.5	32.2	20.3	33.9	33.9	12.7	43.4	63.7	3.0	33.7	
Actuated g/C Ratio	0.05	0.18	0.29	0.18	0.31	0.31	0.12	0.39	0.58	0.03	0.31	
Clearance Time (s)	5.6	6.3		5.6	6.3	6.3	5.6	6.3		5.6	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	184	627	463	633	1090	480	396	2006	1613	93	1541	
v/s Ratio Prot	0.03	0.05	c0.24	c0.14	0.11		c0.10	c0.31	0.16	0.01	0.26	
v/s Ratio Perm						0.19						
v/c Ratio	0.51	0.30	0.84	0.77	0.37	0.61	0.89	0.80	0.28	0.35	0.83	
Uniform Delay, d1	50.6	39.3	36.5	42.7	29.7	32.4	47.9	29.4	11.6	52.5	35.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.04	1.27	1.19	0.68	
Incremental Delay, d2	2.2	0.3	12.5	5.8	0.2	2.2	19.3	3.1	0.1	2.0	4.8	
Delay (s)	52.8	39.6	48.9	48.5	30.0	34.6	61.4	33.8	14.8	64.5	29.1	
Level of Service	D	D	D	D	C	C	E	C	B	E	C	
Approach Delay (s)		47.0			38.3			32.8			30.0	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	35.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	23.8
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	592	283	0	1917	1647	0
Future Volume (vph)	592	283	0	1917	1647	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		6.3	6.3	
Lane Util. Factor	0.97	1.00		0.86	0.81	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3433	1583		6408	7544	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3433	1583		6408	7544	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	610	292	0	1976	1698	0
RTOR Reduction (vph)	0	5	0	0	0	0
Lane Group Flow (vph)	610	287	0	1976	1698	0
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	26.1	26.1		72.0	72.0	
Effective Green, g (s)	26.1	26.1		72.0	72.0	
Actuated g/C Ratio	0.24	0.24		0.65	0.65	
Clearance Time (s)	5.6	5.6		6.3	6.3	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	814	375		4194	4937	
v/s Ratio Prot	0.18			c0.31	0.23	
v/s Ratio Perm		c0.18				
v/c Ratio	0.75	0.77		0.47	0.34	
Uniform Delay, d1	38.9	39.1		9.5	8.5	
Progression Factor	1.00	1.00		0.76	0.80	
Incremental Delay, d2	3.3	8.2		0.2	0.1	
Delay (s)	42.3	47.3		7.4	6.9	
Level of Service	D	D		A	A	
Approach Delay (s)	43.9			7.4	6.9	
Approach LOS	D			A	A	

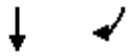
Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	65	36	18	1	168	9	517	12	7	1318	265	693
Future Volume (vph)	65	36	18	1	168	9	517	12	7	1318	265	693
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6			5.6	5.6	5.6		5.2	5.3	5.3	5.2
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00		1.00	0.91	1.00	0.97
Frpb, ped/bikes	1.00	0.99			1.00	1.00	1.00		1.00	1.00	0.97	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.95			1.00	1.00	0.85		1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (prot)	1770	1754			1770	1863	1583		1770	5085	1536	3433
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (perm)	1770	1754			1770	1863	1583		1770	5085	1536	3433
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	66	37	18	1	171	9	528	12	7	1345	270	707
RTOR Reduction (vph)	0	16	0	0	0	0	72	0	0	0	95	0
Lane Group Flow (vph)	66	39	0	0	172	9	456	0	19	1345	175	707
Confl. Peds. (#/hr)			7								9	
Confl. Bikes (#/hr)			4								4	
Turn Type	Prot	NA		Prot	Prot	NA	pt+ov	Prot	Prot	NA	Perm	Prot
Protected Phases	7	4		3	3	8	8 1	5	5	2		1
Permitted Phases											2	
Actuated Green, G (s)	7.6	10.2			19.5	22.1	49.5		2.3	31.2	31.2	27.4
Effective Green, g (s)	7.6	10.2			19.5	22.1	49.5		2.3	31.2	31.2	27.4
Actuated g/C Ratio	0.07	0.09			0.18	0.20	0.45		0.02	0.28	0.28	0.25
Clearance Time (s)	5.6	5.6			5.6	5.6			5.2	5.3	5.3	5.2
Vehicle Extension (s)	3.0	3.0			3.0	3.0			3.0	2.0	2.0	3.0
Lane Grp Cap (vph)	122	162			313	374	712		37	1442	435	855
v/s Ratio Prot	0.04	0.02			c0.10	0.00	c0.29		0.01	c0.26		c0.21
v/s Ratio Perm											0.11	
v/c Ratio	0.54	0.24			0.55	0.02	0.64		0.51	0.93	0.40	0.83
Uniform Delay, d1	49.5	46.3			41.2	35.3	23.4		53.3	38.4	31.9	39.1
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	0.79
Incremental Delay, d2	4.8	0.8			2.0	0.0	2.0		11.5	12.3	2.7	6.3
Delay (s)	54.3	47.1			43.2	35.3	25.3		64.8	50.7	34.6	37.0
Level of Service	D	D			D	D	C		E	D	C	D
Approach Delay (s)		51.0				29.8				48.2		
Approach LOS		D				C				D		

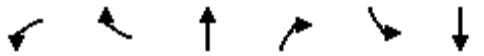
Intersection Summary			
HCM 2000 Control Delay	32.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.7
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1161	51
Future Volume (vph)	1161	51
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	5049	
Flt Permitted	1.00	
Satd. Flow (perm)	5049	
Peak-hour factor, PHF	0.98	0.98
Adj. Flow (vph)	1185	52
RTOR Reduction (vph)	3	0
Lane Group Flow (vph)	1234	0
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		1
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	56.3	
Effective Green, g (s)	56.3	
Actuated g/C Ratio	0.51	
Clearance Time (s)	5.3	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2584	
v/s Ratio Prot	0.24	
v/s Ratio Perm		
v/c Ratio	0.48	
Uniform Delay, d1	17.3	
Progression Factor	0.52	
Incremental Delay, d2	0.6	
Delay (s)	9.6	
Level of Service	A	
Approach Delay (s)	19.6	
Approach LOS	B	

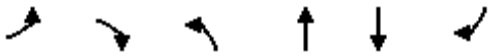
Intersection Summary



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	17	0	1255	0	0	920
Future Volume (Veh/h)	17	0	1255	0	0	920
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	18	0	1307	0	0	958
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			1251			833
pX, platoon unblocked	0.95	0.93			0.93	
vC, conflicting volume	1786	654			1307	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1373	466			1172	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	100			100	
cM capacity (veh/h)	130	503			548	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	18	871	436	0	479	479
Volume Left	18	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	130	1700	1700	1700	1700	1700
Volume to Capacity	0.14	0.51	0.26	0.00	0.28	0.28
Queue Length 95th (ft)	12	0	0	0	0	0
Control Delay (s)	37.1	0.0	0.0	0.0	0.0	0.0
Lane LOS	E					
Approach Delay (s)	37.1	0.0		0.0		
Approach LOS	E					

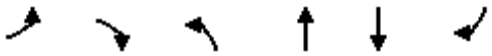
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	6	1255	937	0
Future Volume (Veh/h)	0	0	6	1255	937	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	0	6	1307	976	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1124	960	
pX, platoon unblocked	0.96	0.92	0.92			
vC, conflicting volume	1642	488	976			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1186	256	789			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	99			
cM capacity (veh/h)	172	680	757			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	0	6	654	654	651	325
Volume Left	0	6	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	757	1700	1700	1700	1700
Volume to Capacity	0.00	0.01	0.38	0.38	0.38	0.19
Queue Length 95th (ft)	0	1	0	0	0	0
Control Delay (s)	0.0	9.8	0.0	0.0	0.0	0.0
Lane LOS	A	A				
Approach Delay (s)	0.0	0.0			0.0	
Approach LOS	A					

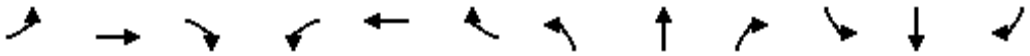
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	38.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	13	45	1467	1116	0
Future Volume (Veh/h)	0	13	45	1467	1116	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	14	47	1528	1163	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1160	892	
pX, platoon unblocked	0.79	0.89	0.89			
vC, conflicting volume	2021	582	1163			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1134	285	938			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	93			
cM capacity (veh/h)	143	634	647			

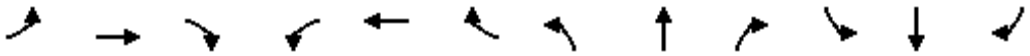
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	14	47	764	764	775	388
Volume Left	0	47	0	0	0	0
Volume Right	14	0	0	0	0	0
cSH	634	647	1700	1700	1700	1700
Volume to Capacity	0.02	0.07	0.45	0.45	0.46	0.23
Queue Length 95th (ft)	2	6	0	0	0	0
Control Delay (s)	10.8	11.0	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	10.8	0.3			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑			↑↑↑↱			↑↑↑↱	
Traffic Volume (vph)	0	0	0	0	0	0	0	1799	73	0	1704	47
Future Volume (vph)	0	0	0	0	0	0	0	1799	73	0	1704	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)								4.0			4.0	
Lane Util. Factor								0.91			0.91	
Frt								0.99			1.00	
Flt Protected								1.00			1.00	
Satd. Flow (prot)								5056			5065	
Flt Permitted								1.00			1.00	
Satd. Flow (perm)								5056			5065	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	0	0	0	0	1874	76	0	1775	49
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	1949	0	0	1824	0
Turn Type								NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases												
Actuated Green, G (s)								506.0			506.0	
Effective Green, g (s)								506.0			506.0	
Actuated g/C Ratio								0.84			0.84	
Clearance Time (s)								4.0			4.0	
Lane Grp Cap (vph)								4263			4271	
v/s Ratio Prot								c0.39			0.36	
v/s Ratio Perm												
v/c Ratio								0.46			0.43	
Uniform Delay, d1								12.0			11.5	
Progression Factor								1.00			1.00	
Incremental Delay, d2								0.4			0.3	
Delay (s)								12.3			11.8	
Level of Service								B			B	
Approach Delay (s)		0.0			0.0			12.3			11.8	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	600.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	9	0	1699	37	0	1279	22
Future Volume (Veh/h)	0	0	0	0	0	9	0	1699	37	0	1279	22
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	0	0	0	0	9	0	1770	39	0	1332	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								645			779	
pX, platoon unblocked	0.81	0.81	0.93	0.81	0.81	0.78	0.93			0.78		
vC, conflicting volume	1942	3152	456	2234	3144	610	1355			1809		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	771	2258	149	1128	2249	0	1117			1041		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	99	100			100		
cM capacity (veh/h)	233	33	809	129	33	844	577			516		

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	9	708	708	393	533	533	289
Volume Left	0	0	0	0	0	0	0
Volume Right	9	0	0	39	0	0	23
cSH	844	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.01	0.42	0.42	0.23	0.31	0.31	0.17
Queue Length 95th (ft)	1	0	0	0	0	0	0
Control Delay (s)	9.3	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	9.3	0.0			0.0		
Approach LOS	A						

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	43.6%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	80	380	140	180	40	260	620	50	30	1230	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7		4.6	5.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1567	1770	1863	1552	3433	3500		1770	3440	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1567	1770	1863	1552	3433	3500		1770	3440	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	41	82	388	143	184	41	265	633	51	31	1255	255
RTOR Reduction (vph)	0	0	96	0	0	34	0	5	0	0	14	0
Lane Group Flow (vph)	41	82	292	143	184	7	265	679	0	31	1496	0
Confl. Peds. (#/hr)			6			3						2
Confl. Bikes (#/hr)						2						1
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	4.1	12.4	25.4	10.1	18.4	18.4	13.0	63.1		4.2	53.2	
Effective Green, g (s)	4.1	12.4	25.4	10.1	18.4	18.4	13.0	63.1		4.2	53.2	
Actuated g/C Ratio	0.04	0.11	0.23	0.09	0.17	0.17	0.12	0.57		0.04	0.48	
Clearance Time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7		4.6	5.7	
Vehicle Extension (s)	2.5	3.0	2.5	2.5	3.0	3.0	2.5	3.5		2.5	3.5	
Lane Grp Cap (vph)	65	210	361	162	311	259	405	2007		67	1663	
v/s Ratio Prot	0.02	0.04	c0.10	c0.08	0.10		0.08	0.19		0.02	c0.43	
v/s Ratio Perm			0.09			0.00						
v/c Ratio	0.63	0.39	0.81	0.88	0.59	0.03	0.65	0.34		0.46	0.90	
Uniform Delay, d1	52.2	45.3	40.0	49.4	42.3	38.3	46.4	12.4		51.8	26.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.85	0.80		1.00	1.00	
Incremental Delay, d2	16.1	1.2	12.2	38.8	3.0	0.0	3.2	0.4		3.6	8.2	
Delay (s)	68.3	46.5	52.2	88.1	45.3	38.4	42.5	10.4		55.4	34.2	
Level of Service	E	D	D	F	D	D	D	B		E	C	
Approach Delay (s)		52.6			61.2			19.4			34.6	
Approach LOS		D			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	35.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

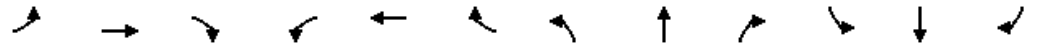
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	20	40	100	60	20	160	870	60	10	1590	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6		4.6	5.7	5.7	4.6	5.7	5.7
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1739	1559	1770	1794		1770	3539	1551	1770	3539	1541
Flt Permitted	0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1739	1559	1770	1794		1770	3539	1551	1770	3539	1541
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	41	20	41	102	61	20	163	888	61	10	1622	153
RTOR Reduction (vph)	0	0	38	0	10	0	0	0	20	0	0	67
Lane Group Flow (vph)	30	31	3	102	71	0	163	888	41	10	1622	86
Confl. Peds. (#/hr)			2									2
Confl. Bikes (#/hr)									1			2
Turn Type	Split	NA	Perm	Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						2			6
Actuated Green, G (s)	8.4	8.4	8.4	6.7	6.7		13.7	74.8	74.8	0.6	61.7	61.7
Effective Green, g (s)	8.4	8.4	8.4	6.7	6.7		13.7	74.8	74.8	0.6	61.7	61.7
Actuated g/C Ratio	0.08	0.08	0.08	0.06	0.06		0.12	0.68	0.68	0.01	0.56	0.56
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6		4.6	5.7	5.7	4.6	5.7	5.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	128	132	119	107	109		220	2406	1054	9	1985	864
v/s Ratio Prot	c0.02	0.02		c0.06	0.04		c0.09	0.25		0.01	c0.46	
v/s Ratio Perm			0.00						0.03			0.06
v/c Ratio	0.23	0.23	0.03	0.95	0.65		0.74	0.37	0.04	1.11	0.82	0.10
Uniform Delay, d1	47.8	47.8	47.0	51.5	50.5		46.4	7.5	5.8	54.7	19.6	11.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.90	0.45	0.04
Incremental Delay, d2	0.9	0.9	0.1	71.6	12.5		12.0	0.4	0.1	245.0	1.9	0.1
Delay (s)	48.7	48.7	47.1	123.1	63.0		58.4	8.0	5.9	294.5	10.8	0.5
Level of Service	D	D	D	F	E		E	A	A	F	B	A
Approach Delay (s)		48.1			96.5			15.2			11.5	
Approach LOS		D			F			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	40	0	0	80	20	1000	40	20	1700	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	0	41	0	0	82	20	1020	41	20	1735	10
Pedestrians		5			3			5			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											917	
pX, platoon unblocked	0.60	0.60	0.60	0.60	0.60		0.60					
vC, conflicting volume	2420	2891	882	2039	2875	536	1750			1064		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2037	2818	0	1403	2793	536	923			1064		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	94	100	100	83	95			97		
cM capacity (veh/h)	15	10	647	52	10	487	441			649		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	41	82	20	680	381	20	1156	588
Volume Left	0	0	20	0	0	20	0	0
Volume Right	41	82	0	0	41	0	0	10
cSH	647	487	441	1700	1700	649	1700	1700
Volume to Capacity	0.06	0.17	0.05	0.40	0.22	0.03	0.68	0.35
Queue Length 95th (ft)	5	15	4	0	0	2	0	0
Control Delay (s)	10.9	13.9	13.6	0.0	0.0	10.7	0.0	0.0
Lane LOS	B	B	B			B		
Approach Delay (s)	10.9	13.9	0.3			0.1		
Approach LOS	B	B						

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	58.8%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	360	550	370	650	140	530	840	250	110	1640	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	6.0	5.0	7.0	7.0	6.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1570	3433	3539	1543	3433	3539	1552	3433	3539	1559
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1570	3433	3539	1543	3433	3539	1552	3433	3539	1559
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	92	367	561	378	663	143	541	857	255	112	1673	112
RTOR Reduction (vph)	0	0	85	0	0	105	0	0	125	0	0	65
Lane Group Flow (vph)	92	367	476	378	663	38	541	857	130	112	1673	47
Confl. Peds. (#/hr)			1			8			4			2
Confl. Bikes (#/hr)			2									
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	6.0	29.9	51.9	15.0	38.9	38.9	22.0	80.8	80.8	9.3	67.1	67.1
Effective Green, g (s)	6.0	29.9	51.9	15.0	38.9	38.9	22.0	80.8	80.8	9.3	67.1	67.1
Actuated g/C Ratio	0.04	0.19	0.33	0.09	0.24	0.24	0.14	0.51	0.51	0.06	0.42	0.42
Clearance Time (s)	5.0	7.0	6.0	5.0	7.0	7.0	6.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	3.0	3.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	129	956	512	323	865	377	475	1798	788	200	1493	657
v/s Ratio Prot	0.03	0.07	c0.13	c0.11	0.19		c0.16	0.24		0.03	c0.47	
v/s Ratio Perm			0.17			0.02			0.08			0.03
v/c Ratio	0.71	0.38	0.93	1.17	0.77	0.10	1.14	0.48	0.16	0.56	1.12	0.07
Uniform Delay, d1	75.6	56.5	51.8	72.0	55.8	46.5	68.5	25.4	21.0	72.9	46.0	27.4
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
Incremental Delay, d2	17.0	0.5	23.4	104.7	4.8	0.2	85.3	0.3	0.1	3.6	63.8	0.1
Delay (s)	92.6	57.0	75.2	176.7	60.7	46.8	153.8	25.7	21.1	76.4	109.7	27.5
Level of Service	F	E	E	F	E	D	F	C	C	E	F	C
Approach Delay (s)		70.2			96.0			66.9			102.9	
Approach LOS		E			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	85.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	159.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	105.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	10	10	190	10	900	10	910	90	810	1600	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95		0.97	0.95	
Frpb, ped/bikes		1.00	0.98		1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.97	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1797	1557		1772	2751	1770	3486		3433	3531	
Flt Permitted		0.78	1.00		0.71	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1441	1557		1326	2751	1770	3486		3433	3531	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	20	10	10	194	10	918	10	929	92	827	1633	20
RTOR Reduction (vph)	0	0	8	0	0	43	0	6	0	0	1	0
Lane Group Flow (vph)	0	30	2	0	204	875	10	1015	0	827	1652	0
Confl. Peds. (#/hr)	6		3	3		6			2			7
Confl. Bikes (#/hr)			1						4			
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		21.1	21.1		21.1	52.8	0.6	42.3		31.7	73.4	
Effective Green, g (s)		21.1	21.1		21.1	52.8	0.6	42.3		31.7	73.4	
Actuated g/C Ratio		0.19	0.19		0.19	0.48	0.01	0.38		0.29	0.67	
Clearance Time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.5		3.0	3.5	
Lane Grp Cap (vph)		276	298		254	1435	9	1340		989	2356	
v/s Ratio Prot						0.18	c0.01	c0.29		c0.24	0.47	
v/s Ratio Perm		0.02	0.00		c0.15	0.14						
v/c Ratio		0.11	0.01		0.80	0.61	1.11	0.76		0.84	0.70	
Uniform Delay, d1		36.7	36.0		42.5	21.0	54.7	29.4		36.7	11.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2	0.0		16.6	0.7	342.2	4.0		6.2	1.8	
Delay (s)		36.9	36.0		59.0	21.8	396.9	33.4		43.0	13.2	
Level of Service		D	D		E	C	F	C		D	B	
Approach Delay (s)		36.6			28.5			37.0			23.1	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	82.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	30	40	80	10	220	10	740	20	310	1500	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.2		5.0	4.2	4.2	5.3		4.2	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		0.97	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1803	1561		1783	1575	1770	3523		1770	3523	
Flt Permitted		0.74	1.00		0.67	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1376	1561		1240	1575	1770	3523		1770	3523	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	51	31	41	82	10	224	10	755	20	316	1531	41
RTOR Reduction (vph)	0	0	36	0	0	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	82	5	0	92	224	10	774	0	316	1571	0
Confl. Peds. (#/hr)	2					2			2			3
Confl. Bikes (#/hr)			1						1			
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		13.2	13.2		12.4	36.7	0.8	59.6		24.3	83.1	
Effective Green, g (s)		13.2	13.2		12.4	36.7	0.8	59.6		24.3	83.1	
Actuated g/C Ratio		0.12	0.12		0.11	0.33	0.01	0.54		0.22	0.75	
Clearance Time (s)		4.2	4.2		5.0	4.2	4.2	5.3		4.2	5.3	
Vehicle Extension (s)		3.0	3.0		3.5	2.0	2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		163	185		138	521	12	1895		388	2642	
v/s Ratio Prot						0.09	c0.01	0.22		c0.18	c0.45	
v/s Ratio Perm		0.06	0.00		c0.07	0.05						
v/c Ratio		0.50	0.03		0.67	0.43	0.83	0.41		0.81	0.59	
Uniform Delay, d1		45.7	43.1		47.2	28.9	54.9	15.2		41.1	6.2	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.4	0.1		12.0	0.2	163.6	0.7		11.7	1.0	
Delay (s)		48.2	43.2		59.2	29.1	218.5	15.8		52.9	7.2	
Level of Service		D	D		E	C	F	B		D	A	
Approach Delay (s)		46.5			37.9			18.4			14.9	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	110.8	Sum of lost time (s)	14.5
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	30	760	40	60	1560
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	31	776	41	61	1592
Pedestrians	4					4
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1718	416			820	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1718	416			820	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	95			92	
cM capacity (veh/h)	74	581			802	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	31	517	299	61	796	796
Volume Left	0	0	0	61	0	0
Volume Right	31	0	41	0	0	0
cSH	581	1700	1700	802	1700	1700
Volume to Capacity	0.05	0.30	0.18	0.08	0.47	0.47
Queue Length 95th (ft)	4	0	0	6	0	0
Control Delay (s)	11.5	0.0	0.0	9.9	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	11.5	0.0		0.4		
Approach LOS	B					

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	80	130	50	720	1580	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6		4.2	6.5	6.5	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frpb, ped/bikes	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.92		1.00	1.00	1.00	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1675		1770	3539	3520	
Flt Permitted	0.98		0.95	1.00	1.00	
Satd. Flow (perm)	1675		1770	3539	3520	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	82	133	51	735	1612	51
RTOR Reduction (vph)	65	0	0	0	2	0
Lane Group Flow (vph)	150	0	51	735	1661	0
Confl. Peds. (#/hr)						4
Turn Type	Prot		Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases						
Actuated Green, G (s)	14.4		4.6	74.5	65.7	
Effective Green, g (s)	14.4		4.6	74.5	65.7	
Actuated g/C Ratio	0.14		0.05	0.74	0.66	
Clearance Time (s)	4.6		4.2	6.5	6.5	
Vehicle Extension (s)	3.0		3.0	4.0	4.0	
Lane Grp Cap (vph)	241		81	2636	2312	
v/s Ratio Prot	c0.09		c0.03	0.21	c0.47	
v/s Ratio Perm						
v/c Ratio	0.62		0.63	0.28	0.72	
Uniform Delay, d1	40.2		46.9	4.1	11.1	
Progression Factor	1.00		0.60	0.38	1.00	
Incremental Delay, d2	4.9		14.0	0.3	2.0	
Delay (s)	45.2		42.2	1.8	13.1	
Level of Service	D		D	A	B	
Approach Delay (s)	45.2			4.5	13.1	
Approach LOS	D			A	B	

Intersection Summary			
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	20	70	30	10	40	70	720	50	30	1640	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6		4.7	5.7		4.7	5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.88		1.00	0.88		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1628		1770	1638		1770	3499		1770	3521	
Flt Permitted	0.72	1.00		0.68	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1348	1628		1268	1638		1770	3499		1770	3521	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	20	20	71	31	10	41	71	735	51	31	1673	51
RTOR Reduction (vph)	0	64	0	0	37	0	0	3	0	0	2	0
Lane Group Flow (vph)	20	27	0	31	14	0	71	783	0	31	1722	0
Confl. Peds. (#/hr)			1						2			1
Confl. Bikes (#/hr)									2			
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	9.3	9.3		9.3	9.3		7.1	71.9		3.8	68.6	
Effective Green, g (s)	9.3	9.3		9.3	9.3		7.1	71.9		3.8	68.6	
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.07	0.72		0.04	0.69	
Clearance Time (s)	4.6	4.6		4.6	4.6		4.7	5.7		4.7	5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	125	151		117	152		125	2515		67	2415	
v/s Ratio Prot		0.02			0.01		c0.04	0.22		0.02	c0.49	
v/s Ratio Perm	0.01			c0.02								
v/c Ratio	0.16	0.18		0.26	0.09		0.57	0.31		0.46	0.71	
Uniform Delay, d1	41.8	41.8		42.2	41.5		45.0	5.1		47.1	9.7	
Progression Factor	1.00	1.00		1.00	1.00		1.61	0.12		0.71	0.13	
Incremental Delay, d2	0.6	0.6		1.2	0.3		5.2	0.3		3.6	1.3	
Delay (s)	42.4	42.4		43.4	41.7		77.7	0.9		37.0	2.6	
Level of Service	D	D		D	D		E	A		D	A	
Approach Delay (s)		42.4			42.4			7.2			3.2	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	50	170	140	50	50	380	750	160	100	1550	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0		4.6	5.7	5.7	4.6	6.7	6.7
Lane Util. Factor		1.00	1.00	1.00	1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1822	1583	1770	1712		3433	3539	1541	1770	3539	1559
Flt Permitted		0.98	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1822	1583	1770	1712		3433	3539	1541	1770	3539	1559
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	41	51	173	143	51	51	388	765	163	102	1582	92
RTOR Reduction (vph)	0	0	112	0	32	0	0	0	95	0	0	56
Lane Group Flow (vph)	0	92	61	143	70	0	388	765	68	102	1582	36
Confl. Peds. (#/hr)			5						2			2
Confl. Bikes (#/hr)						1			1			
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4	4 5	3	3		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)		12.7	27.7	16.0	16.0		10.4	41.9	41.9	9.1	39.6	39.6
Effective Green, g (s)		12.7	23.1	16.0	16.0		10.4	41.9	41.9	9.1	39.6	39.6
Actuated g/C Ratio		0.13	0.23	0.16	0.16		0.10	0.42	0.42	0.09	0.40	0.40
Clearance Time (s)		5.0		5.0	5.0		4.6	5.7	5.7	4.6	6.7	6.7
Vehicle Extension (s)		3.0		3.0	3.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)		231	365	283	273		357	1482	645	161	1401	617
v/s Ratio Prot		c0.05	0.04	c0.08	0.04		c0.11	0.22		0.06	c0.45	
v/s Ratio Perm									0.04			0.02
v/c Ratio		0.40	0.17	0.51	0.26		1.09	0.52	0.11	0.63	1.13	0.06
Uniform Delay, d1		40.1	30.8	38.4	36.8		44.8	21.5	17.7	43.8	30.2	18.7
Progression Factor		1.00	1.00	1.00	1.00		0.74	0.48	0.21	0.88	0.68	1.00
Incremental Delay, d2		1.1	0.2	1.4	0.5		71.1	1.2	0.3	6.0	65.6	0.1
Delay (s)		41.3	31.0	39.8	37.3		104.4	11.6	4.0	44.4	86.2	18.8
Level of Service		D	C	D	D		F	B	A	D	F	B
Approach Delay (s)		34.6			38.8			38.0			80.3	
Approach LOS		C			D			D			F	

Intersection Summary			
HCM 2000 Control Delay	58.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	90	390	450	180	280	180	960	800	50	1770	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	6.3	6.3	5.6	6.3		5.6	6.3	6.3	5.6	6.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		1.00	0.91	1.00	0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3539	1583	3433	3187		1770	5085	1583	3433	5067	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	3539	1583	3433	3187		1770	5085	1583	3433	5067	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	51	92	398	459	184	286	184	980	816	51	1806	41
RTOR Reduction (vph)	0	0	182	0	131	0	0	0	153	0	3	0
Lane Group Flow (vph)	51	92	216	459	339	0	184	980	663	51	1844	0
Confl. Peds. (#/hr)						2			10			
Confl. Bikes (#/hr)												1
Turn Type	Prot	NA	pt+ov	Prot	NA		Prot	NA	pt+ov	Prot	NA	
Protected Phases	7	4	4 5	3	8		5	2	2 3	1	6	
Permitted Phases												
Actuated Green, G (s)	5.4	10.7	22.4	17.9	23.2		11.7	43.6	67.1	4.0	35.9	
Effective Green, g (s)	5.4	10.7	22.4	17.9	23.2		11.7	43.6	61.5	4.0	35.9	
Actuated g/C Ratio	0.05	0.11	0.22	0.18	0.23		0.12	0.44	0.62	0.04	0.36	
Clearance Time (s)	5.6	6.3		5.6	6.3		5.6	6.3		5.6	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	185	378	354	614	739		207	2217	973	137	1819	
v/s Ratio Prot	0.01	0.03	0.14	c0.13	c0.11		c0.10	0.19	0.42	0.01	c0.36	
v/s Ratio Perm												
v/c Ratio	0.28	0.24	0.61	0.75	0.46		0.89	0.44	0.68	0.37	1.01	
Uniform Delay, d1	45.4	40.9	34.9	38.9	33.0		43.5	19.7	12.8	46.8	32.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.87	0.84	1.01	0.51	0.23	
Incremental Delay, d2	0.8	0.3	3.0	5.0	0.5		32.1	0.6	1.9	0.5	14.6	
Delay (s)	46.2	41.3	37.8	43.9	33.5		70.2	17.2	14.8	24.1	22.2	
Level of Service	D	D	D	D	C		E	B	B	C	C	
Approach Delay (s)		39.2			38.6			21.1			22.2	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	23.8
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	640	210	0	1300	2220	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		6.3	6.3	
Lane Util. Factor	0.97	1.00		0.86	0.81	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3433	1583		6408	7544	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3433	1583		6408	7544	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	653	214	0	1327	2265	0
RTOR Reduction (vph)	0	2	0	0	0	0
Lane Group Flow (vph)	653	212	0	1327	2265	0
Confl. Bikes (#/hr)						1
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	23.9	23.9		64.2	64.2	
Effective Green, g (s)	23.9	23.9		64.2	64.2	
Actuated g/C Ratio	0.24	0.24		0.64	0.64	
Clearance Time (s)	5.6	5.6		6.3	6.3	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	820	378		4113	4843	
v/s Ratio Prot	c0.19			0.21	c0.30	
v/s Ratio Perm		0.13				
v/c Ratio	0.80	0.56		0.32	0.47	
Uniform Delay, d1	35.8	33.4		8.1	9.2	
Progression Factor	1.00	1.00		0.49	0.64	
Incremental Delay, d2	5.0	1.1		0.2	0.1	
Delay (s)	40.8	34.6		4.1	6.0	
Level of Service	D	C		A	A	
Approach Delay (s)	39.3			4.1	6.0	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	20	10	110	20	290	40	960	300	700	1640	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		4.2	5.6	5.6	5.2	5.3		5.2	5.3	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.91		0.97	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1762		1770	1863	1583	1770	4876		3433	5039	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1762		1770	1863	1583	1770	4876		3433	5039	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	51	20	10	112	20	296	41	980	306	714	1673	92
RTOR Reduction (vph)	0	9	0	0	0	88	0	52	0	0	4	0
Lane Group Flow (vph)	51	21	0	112	20	208	41	1234	0	714	1761	0
Confl. Peds. (#/hr)			1						7			1
Confl. Bikes (#/hr)									2			1
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	8 1	5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.1	10.5		10.1	10.1	38.7	3.1	30.5		28.6	56.0	
Effective Green, g (s)	9.1	10.5		10.1	10.1	38.7	3.1	30.5		28.6	56.0	
Actuated g/C Ratio	0.09	0.10		0.10	0.10	0.39	0.03	0.30		0.29	0.56	
Clearance Time (s)	5.6	5.6		4.2	5.6		5.2	5.3		5.2	5.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	161	185		178	188	612	54	1487		981	2821	
v/s Ratio Prot	c0.03	0.01		c0.06	0.01	0.13	0.02	c0.25		c0.21	0.35	
v/s Ratio Perm												
v/c Ratio	0.32	0.11		0.63	0.11	0.34	0.76	0.83		0.73	0.62	
Uniform Delay, d1	42.5	40.5		43.2	40.8	21.6	48.1	32.3		32.2	14.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.02	0.20	
Incremental Delay, d2	1.1	0.3		6.8	0.3	0.3	45.2	5.5		2.5	1.0	
Delay (s)	43.7	40.8		49.9	41.1	22.0	93.3	37.8		35.5	3.9	
Level of Service	D	D		D	D	C	F	D		D	A	
Approach Delay (s)		42.6			30.2			39.6			13.0	
Approach LOS		D			C			D			B	

Intersection Summary			
HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	21.7
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	240	160	450	100	100	50	400	1300	130	50	880	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7		4.6	5.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1572	1770	1863	1583	3433	3484		1770	3474	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1572	1770	1863	1583	3433	3484		1770	3474	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	245	163	459	102	102	51	408	1327	133	51	898	112
RTOR Reduction (vph)	0	0	79	0	0	46	0	5	0	0	6	0
Lane Group Flow (vph)	245	163	380	102	102	5	408	1455	0	51	1004	0
Confl. Peds. (#/hr)			1									2
Confl. Bikes (#/hr)									2			2
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	21.0	22.1	43.1	12.0	13.1	13.1	21.0	69.1		6.6	53.6	
Effective Green, g (s)	21.0	22.1	43.1	12.0	13.1	13.1	21.0	69.1		6.6	53.6	
Actuated g/C Ratio	0.16	0.17	0.33	0.09	0.10	0.10	0.16	0.53		0.05	0.41	
Clearance Time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7		4.6	5.7	
Vehicle Extension (s)	2.5	3.0	2.5	2.5	3.0	3.0	2.5	3.5		2.5	3.5	
Lane Grp Cap (vph)	285	316	521	163	187	159	554	1851		89	1432	
v/s Ratio Prot	c0.14	0.09	c0.12	0.06	0.05		0.12	c0.42		0.03	c0.29	
v/s Ratio Perm			0.12			0.00						
v/c Ratio	0.86	0.52	0.73	0.63	0.55	0.03	0.74	0.79		0.57	0.70	
Uniform Delay, d1	53.1	49.1	38.3	56.8	55.6	52.7	51.9	24.5		60.3	31.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.62	0.33		1.00	1.00	
Incremental Delay, d2	21.6	1.4	4.8	6.3	3.2	0.1	3.4	2.5		7.1	2.9	
Delay (s)	74.7	50.5	43.1	63.2	58.8	52.8	35.7	10.4		67.4	34.5	
Level of Service	E	D	D	E	E	D	D	B		E	C	
Approach Delay (s)		53.4			59.4			16.0			36.0	
Approach LOS		D			E			B			D	

Intersection Summary			
HCM 2000 Control Delay	32.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	70	150	90	30	10	110	1700	170	20	1330	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6		4.6	5.7	5.7	4.6	5.7	5.7
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.99	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1746	1546	1770	1795		1770	3539	1550	1770	3539	1550
Flt Permitted	0.95	0.99	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1746	1546	1770	1795		1770	3539	1550	1770	3539	1550
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	122	71	153	92	31	10	112	1735	173	20	1357	82
RTOR Reduction (vph)	0	0	138	0	9	0	0	0	43	0	0	35
Lane Group Flow (vph)	95	98	15	92	32	0	112	1735	131	20	1357	47
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			1						2			2
Turn Type	Split	NA	Perm	Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						2			6
Actuated Green, G (s)	13.1	13.1	13.1	9.4	9.4		13.4	85.8	85.8	2.2	74.6	74.6
Effective Green, g (s)	13.1	13.1	13.1	9.4	9.4		13.4	85.8	85.8	2.2	74.6	74.6
Actuated g/C Ratio	0.10	0.10	0.10	0.07	0.07		0.10	0.66	0.66	0.02	0.57	0.57
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6		4.6	5.7	5.7	4.6	5.7	5.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	169	175	155	127	129		182	2335	1023	29	2030	889
v/s Ratio Prot	c0.06	0.06		c0.05	0.02		0.06	c0.49		0.01	c0.38	
v/s Ratio Perm			0.01						0.08			0.03
v/c Ratio	0.56	0.56	0.10	0.72	0.25		0.62	0.74	0.13	0.69	0.67	0.05
Uniform Delay, d1	55.7	55.7	53.1	59.0	57.0		55.8	14.7	8.2	63.6	19.2	12.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.28	0.23	0.01	0.79	0.56	0.13
Incremental Delay, d2	4.2	4.1	0.3	18.4	1.0		0.5	0.2	0.0	35.4	1.2	0.1
Delay (s)	59.9	59.8	53.4	77.5	58.0		72.2	3.6	0.1	85.6	12.0	1.7
Level of Service	E	E	D	E	E		E	A	A	F	B	A
Approach Delay (s)		57.0			71.4			7.1			12.4	
Approach LOS		E			E			A			B	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	30	0	0	50	40	1920	50	30	1520	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	0	31	0	0	51	41	1959	51	31	1551	20
Pedestrians		13			21			13			17	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											901	
pX, platoon unblocked	0.73	0.73	0.73	0.73	0.73		0.73					
vC, conflicting volume	2765	3748	812	2968	3733	1043	1584			2031		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2676	4031	0	2955	4010	1043	1049			2031		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	96	100	100	77	91			89		
cM capacity (veh/h)	5	2	770	4	2	219	473			270		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	31	51	41	1306	704	31	1034	537
Volume Left	0	0	41	0	0	31	0	0
Volume Right	31	51	0	0	51	0	0	20
cSH	770	219	473	1700	1700	270	1700	1700
Volume to Capacity	0.04	0.23	0.09	0.77	0.41	0.11	0.61	0.32
Queue Length 95th (ft)	3	22	7	0	0	9	0	0
Control Delay (s)	9.9	26.4	13.3	0.0	0.0	20.0	0.0	0.0
Lane LOS	A	D	B			C		
Approach Delay (s)	9.9	26.4	0.3			0.4		
Approach LOS	A	D						

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	69.9%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	360	830	640	380	680	240	430	1490	290	310	1170	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	6.0	5.0	7.0	7.0	6.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1553	3433	3539	1525	3433	3539	1544	3433	3539	1528
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1553	3433	3539	1525	3433	3539	1544	3433	3539	1528
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	367	847	653	388	694	245	439	1520	296	316	1194	153
RTOR Reduction (vph)	0	0	75	0	0	131	0	0	142	0	0	88
Lane Group Flow (vph)	367	847	578	388	694	114	439	1520	154	316	1194	65
Confl. Peds. (#/hr)			11			18			8			18
Confl. Bikes (#/hr)			2									
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.0	31.2	47.2	13.0	33.2	33.2	16.0	51.0	51.0	10.8	44.8	44.8
Effective Green, g (s)	11.0	31.2	47.2	13.0	33.2	33.2	16.0	51.0	51.0	10.8	44.8	44.8
Actuated g/C Ratio	0.08	0.24	0.36	0.10	0.26	0.26	0.12	0.39	0.39	0.08	0.34	0.34
Clearance Time (s)	5.0	7.0	6.0	5.0	7.0	7.0	6.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	3.0	3.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	290	1220	563	343	903	389	422	1388	605	285	1219	526
v/s Ratio Prot	0.11	0.17	c0.13	c0.11	0.20		0.13	c0.43		0.09	c0.34	
v/s Ratio Perm			0.25			0.07			0.10			0.04
v/c Ratio	1.27	0.69	1.03	1.13	0.77	0.29	1.04	1.10	0.26	1.11	0.98	0.12
Uniform Delay, d1	59.5	45.1	41.4	58.5	44.8	39.0	57.0	39.5	26.7	59.6	42.1	29.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.87	0.67	0.50
Incremental Delay, d2	144.0	2.2	45.1	89.0	4.7	0.9	54.7	54.5	1.0	80.5	18.7	0.4
Delay (s)	203.5	47.3	86.5	147.5	49.5	39.8	111.7	94.0	27.7	132.3	47.1	14.9
Level of Service	F	D	F	F	D	D	F	F	C	F	D	B
Approach Delay (s)		91.7			76.4			88.7			60.3	
Approach LOS		F			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	80.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	101.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	10	90	10	810	20	1600	150	920	1250	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95		0.97	0.95	
Frpb, ped/bikes		1.00	0.98		1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1814	1551		1778	2762	1770	3488		3433	3528	
Flt Permitted		0.86	1.00		0.73	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1606	1551		1361	2762	1770	3488		3433	3528	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	10	10	10	92	10	827	20	1633	153	939	1276	20
RTOR Reduction (vph)	0	0	9	0	0	38	0	5	0	0	1	0
Lane Group Flow (vph)	0	20	1	0	102	789	20	1781	0	939	1295	0
Confl. Peds. (#/hr)	3		2	2		3			5			8
Confl. Bikes (#/hr)			3									3
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		16.2	16.2		16.2	49.3	2.7	65.8		33.1	96.2	
Effective Green, g (s)		16.2	16.2		16.2	49.3	2.7	65.8		33.1	96.2	
Actuated g/C Ratio		0.12	0.12		0.12	0.38	0.02	0.51		0.25	0.74	
Clearance Time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.5		3.0	3.5	
Lane Grp Cap (vph)		200	193		169	1145	36	1765		874	2610	
v/s Ratio Prot						c0.18	0.01	c0.51		c0.27	0.37	
v/s Ratio Perm		0.01	0.00		0.07	0.11						
v/c Ratio		0.10	0.01		0.60	0.69	0.56	1.01		1.07	0.50	
Uniform Delay, d1		50.4	49.8		53.9	33.9	63.1	32.1		48.5	6.9	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2	0.0		6.0	1.7	17.3	23.7		52.5	0.7	
Delay (s)		50.7	49.9		59.8	35.7	80.3	55.8		100.9	7.6	
Level of Service		D	D		E	D	F	E		F	A	
Approach Delay (s)		50.4			38.3			56.0			46.8	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	48.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	20	30	60	30	350	50	1380	60	250	1040	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.2		5.0	4.2	4.2	5.3		4.2	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.97		1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1793	1542		1799	1570	1770	3513		1770	3510	
Flt Permitted		0.74	1.00		0.76	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1364	1542		1419	1570	1770	3513		1770	3510	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	41	20	31	61	31	357	51	1408	61	255	1061	61
RTOR Reduction (vph)	0	0	27	0	0	0	0	2	0	0	2	0
Lane Group Flow (vph)	0	61	4	0	92	357	51	1467	0	255	1120	0
Confl. Peds. (#/hr)	4		5	2		4			2			
Confl. Bikes (#/hr)			3						1			
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		15.2	15.2		14.4	36.9	6.9	79.1		22.5	94.7	
Effective Green, g (s)		15.2	15.2		14.4	36.9	6.9	79.1		22.5	94.7	
Actuated g/C Ratio		0.12	0.12		0.11	0.28	0.05	0.61		0.17	0.73	
Clearance Time (s)		4.2	4.2		5.0	4.2	4.2	5.3		4.2	5.3	
Vehicle Extension (s)		3.0	3.0		3.5	2.0	2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		158	179		156	443	93	2129		305	2547	
v/s Ratio Prot						c0.14	0.03	c0.42		c0.14	0.32	
v/s Ratio Perm		0.04	0.00		0.06	0.09						
v/c Ratio		0.39	0.02		0.59	0.81	0.55	0.69		0.84	0.44	
Uniform Delay, d1		53.3	51.1		55.2	43.5	60.3	17.4		52.2	7.2	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.6	0.0		6.0	9.7	3.5	1.8		17.0	0.6	
Delay (s)		54.9	51.1		61.2	53.2	63.8	19.2		69.2	7.8	
Level of Service		D	D		E	D	E	B		E	A	
Approach Delay (s)		53.6			54.8			20.7			19.1	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	130.5	Sum of lost time (s)	14.5
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	30	1480	70	40	1090
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	31	1510	71	41	1112
Pedestrians	5					4
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			350			
pX, platoon unblocked	0.83	0.83			0.83	
vC, conflicting volume	2189	800			1587	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2019	340			1291	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	94			91	
cM capacity (veh/h)	38	538			439	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	31	1007	575	41	556	556
Volume Left	0	0	0	41	0	0
Volume Right	31	0	71	0	0	0
cSH	538	1700	1700	439	1700	1700
Volume to Capacity	0.06	0.59	0.34	0.09	0.33	0.33
Queue Length 95th (ft)	5	0	0	8	0	0
Control Delay (s)	12.1	0.0	0.0	14.0	0.0	0.0
Lane LOS	B			B		
Approach Delay (s)	12.1	0.0		0.5		
Approach LOS	B					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	70	70	180	1480	1020	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6		4.2	6.5	6.5	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frpb, ped/bikes	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.93		1.00	1.00	0.99	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1695		1770	3539	3493	
Flt Permitted	0.98		0.95	1.00	1.00	
Satd. Flow (perm)	1695		1770	3539	3493	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	71	71	184	1510	1041	82
RTOR Reduction (vph)	37	0	0	0	4	0
Lane Group Flow (vph)	105	0	184	1510	1119	0
Confl. Peds. (#/hr)						3
Confl. Bikes (#/hr)						2
Turn Type	Prot		Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases						
Actuated Green, G (s)	13.0		20.8	85.9	60.9	
Effective Green, g (s)	13.0		20.8	85.9	60.9	
Actuated g/C Ratio	0.12		0.19	0.78	0.55	
Clearance Time (s)	4.6		4.2	6.5	6.5	
Vehicle Extension (s)	3.0		3.0	4.0	4.0	
Lane Grp Cap (vph)	200		334	2763	1933	
v/s Ratio Prot	c0.06		0.10	c0.43	0.32	
v/s Ratio Perm						
v/c Ratio	0.52		0.55	0.55	0.58	
Uniform Delay, d1	45.6		40.4	4.6	16.1	
Progression Factor	1.00		0.72	0.09	1.00	
Incremental Delay, d2	2.5		1.6	0.6	1.3	
Delay (s)	48.1		30.6	1.0	17.4	
Level of Service	D		C	A	B	
Approach Delay (s)	48.1			4.2	17.4	
Approach LOS	D			A	B	

Intersection Summary			
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	20	50	40	20	40	90	1600	80	40	1030	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6		4.7	5.7		4.7	5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.90		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1662		1770	1659		1770	3509		1770	3521	
Flt Permitted	0.72	1.00		0.71	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1336	1662		1324	1659		1770	3509		1770	3521	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	20	20	51	41	20	41	92	1633	82	41	1051	31
RTOR Reduction (vph)	0	46	0	0	37	0	0	2	0	0	1	0
Lane Group Flow (vph)	20	25	0	41	24	0	92	1713	0	41	1081	0
Confl. Peds. (#/hr)									2			3
Confl. Bikes (#/hr)						1			1			2
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	9.9	9.9		9.9	9.9		9.2	81.3		3.8	75.9	
Effective Green, g (s)	9.9	9.9		9.9	9.9		9.2	81.3		3.8	75.9	
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.08	0.74		0.03	0.69	
Clearance Time (s)	4.6	4.6		4.6	4.6		4.7	5.7		4.7	5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	120	149		119	149		148	2593		61	2429	
v/s Ratio Prot		0.01			0.01		0.05	c0.49		c0.02	0.31	
v/s Ratio Perm	0.01			c0.03								
v/c Ratio	0.17	0.17		0.34	0.16		0.62	0.66		0.67	0.44	
Uniform Delay, d1	46.2	46.2		47.0	46.2		48.7	7.3		52.5	7.6	
Progression Factor	1.00	1.00		1.00	1.00		1.41	0.32		0.65	0.11	
Incremental Delay, d2	0.7	0.5		1.7	0.5		3.4	0.6		21.7	0.5	
Delay (s)	46.9	46.8		48.7	46.7		71.9	2.9		56.0	1.3	
Level of Service	D	D		D	D		E	A		E	A	
Approach Delay (s)		46.8			47.5			6.4			3.3	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	60	410	150	80	120	410	1520	190	80	940	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0		4.6	5.7	5.7	4.6	6.7	6.7
Lane Util. Factor		1.00	1.00	1.00	1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1801	1583	1770	1681		3433	3539	1540	1770	3539	1538
Flt Permitted		0.97	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1801	1583	1770	1681		3433	3539	1540	1770	3539	1538
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	133	61	418	153	82	122	418	1551	194	82	959	102
RTOR Reduction (vph)	0	0	90	0	49	0	0	0	80	0	0	62
Lane Group Flow (vph)	0	194	328	153	155	0	418	1551	114	82	959	40
Confl. Peds. (#/hr)			17						2			8
Confl. Bikes (#/hr)						1			1			1
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4	4 5	3	3		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)		18.4	35.1	10.0	10.0		16.7	51.9	51.9	9.4	43.6	43.6
Effective Green, g (s)		18.4	35.1	10.0	10.0		16.7	51.9	51.9	9.4	43.6	43.6
Actuated g/C Ratio		0.17	0.32	0.09	0.09		0.15	0.47	0.47	0.09	0.40	0.40
Clearance Time (s)		5.0		5.0	5.0		4.6	5.7	5.7	4.6	6.7	6.7
Vehicle Extension (s)		3.0		3.0	3.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)		301	505	160	152		521	1669	726	151	1402	609
v/s Ratio Prot		0.11	c0.21	0.09	c0.09		0.12	c0.44		0.05	c0.27	
v/s Ratio Perm									0.07			0.03
v/c Ratio		0.64	0.65	0.96	1.02		0.80	0.93	0.16	0.54	0.68	0.07
Uniform Delay, d1		42.7	32.2	49.8	50.0		45.1	27.3	16.6	48.2	27.5	20.6
Progression Factor		1.00	1.00	1.00	1.00		0.74	0.53	0.09	0.82	0.54	0.62
Incremental Delay, d2		4.7	2.9	57.6	78.1		6.4	8.1	0.3	3.7	2.5	0.2
Delay (s)		47.4	35.1	107.4	128.1		39.6	22.6	1.9	43.1	17.5	13.1
Level of Service		D	D	F	F		D	C	A	D	B	B
Approach Delay (s)		39.0			119.2			24.0			18.9	
Approach LOS		D			F			C			B	

Intersection Summary			
HCM 2000 Control Delay	32.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	90.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	140	390	510	310	350	290	1670	680	40	1390	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	6.3	6.3	5.6	6.3		5.6	6.3	6.3	5.6	6.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		1.00	0.91	1.00	0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3539	1583	3433	3232		1770	5085	1583	3433	5046	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	3539	1583	3433	3232		1770	5085	1583	3433	5046	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	102	143	398	520	316	357	296	1704	694	41	1418	71
RTOR Reduction (vph)	0	0	137	0	75	0	0	0	68	0	5	0
Lane Group Flow (vph)	102	143	261	520	598	0	296	1704	626	41	1484	0
Confl. Peds. (#/hr)						2			12			
Confl. Bikes (#/hr)												2
Turn Type	Prot	NA	pt+ov	Prot	NA		Prot	NA	pt+ov	Prot	NA	
Protected Phases	7	4	4 5	3	8		5	2	2 3	1	6	
Permitted Phases												
Actuated Green, G (s)	5.1	10.0	36.9	18.4	23.3		20.6	54.8	73.2	3.0	37.2	
Effective Green, g (s)	5.1	10.0	36.9	18.4	23.3		20.6	54.8	73.2	3.0	37.2	
Actuated g/C Ratio	0.05	0.09	0.34	0.17	0.21		0.19	0.50	0.67	0.03	0.34	
Clearance Time (s)	5.6	6.3		5.6	6.3		5.6	6.3		5.6	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	159	321	531	574	684		331	2533	1053	93	1706	
v/s Ratio Prot	0.03	0.04	0.16	c0.15	c0.19		c0.17	0.34	0.40	0.01	c0.29	
v/s Ratio Perm												
v/c Ratio	0.64	0.45	0.49	0.91	0.87		0.89	0.67	0.59	0.44	0.87	
Uniform Delay, d1	51.6	47.4	29.1	45.0	41.9		43.6	20.8	10.2	52.7	34.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.88	1.13	2.26	0.78	0.71	
Incremental Delay, d2	8.5	1.0	0.7	17.8	12.0		22.5	1.3	0.8	2.4	4.7	
Delay (s)	60.1	48.4	29.8	62.8	53.9		60.8	24.9	23.8	43.3	28.7	
Level of Service	E	D	C	E	D		E	C	C	D	C	
Approach Delay (s)		38.7			57.8			28.5			29.1	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	35.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	23.8
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	690	360	0	1950	1970	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		6.3	6.3	
Lane Util. Factor	0.97	1.00		0.86	0.81	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3433	1583		6408	7544	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3433	1583		6408	7544	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	704	367	0	1990	2010	0
RTOR Reduction (vph)	0	2	0	0	0	0
Lane Group Flow (vph)	704	365	0	1990	2010	0
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	31.1	31.1		67.0	67.0	
Effective Green, g (s)	31.1	31.1		67.0	67.0	
Actuated g/C Ratio	0.28	0.28		0.61	0.61	
Clearance Time (s)	5.6	5.6		6.3	6.3	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	970	447		3903	4594	
v/s Ratio Prot	0.21			c0.31	0.27	
v/s Ratio Perm		c0.23				
v/c Ratio	0.73	0.82		0.51	0.44	
Uniform Delay, d1	35.6	36.8		12.2	11.5	
Progression Factor	1.00	1.00		0.46	0.33	
Incremental Delay, d2	2.3	10.4		0.1	0.2	
Delay (s)	37.9	47.2		5.7	4.0	
Level of Service	D	D		A	A	
Approach Delay (s)	41.1			5.7	4.0	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	180	60	30	200	20	520	30	1250	320	840	1410	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6	5.6	5.2	5.3		5.2	5.3	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.91		0.97	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1753		1770	1863	1583	1770	4900		3433	5039	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1753		1770	1863	1583	1770	4900		3433	5039	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	184	61	31	204	20	531	31	1276	327	857	1439	82
RTOR Reduction (vph)	0	18	0	0	0	47	0	42	0	0	6	0
Lane Group Flow (vph)	184	74	0	204	20	484	31	1561	0	857	1515	0
Confl. Peds. (#/hr)			7						9			
Confl. Bikes (#/hr)			4						4			1
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	8 1	5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.7	22.3		14.4	22.0	43.7	3.5	29.9		21.7	48.1	
Effective Green, g (s)	14.7	22.3		14.4	22.0	43.7	3.5	29.9		21.7	48.1	
Actuated g/C Ratio	0.13	0.20		0.13	0.20	0.40	0.03	0.27		0.20	0.44	
Clearance Time (s)	5.6	5.6		5.6	5.6		5.2	5.3		5.2	5.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	236	355		231	372	628	56	1331		677	2203	
v/s Ratio Prot	c0.10	0.04		0.12	0.01	c0.31	0.02	c0.32		c0.25	0.30	
v/s Ratio Perm												
v/c Ratio	0.78	0.21		0.88	0.05	0.77	0.55	1.17		1.27	0.69	
Uniform Delay, d1	46.1	36.5		47.0	35.6	28.8	52.5	40.0		44.1	24.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		0.93	0.61	
Incremental Delay, d2	15.0	0.3		30.2	0.1	5.8	11.3	86.2		130.2	1.6	
Delay (s)	61.0	36.8		77.2	35.6	34.6	63.8	126.3		171.4	16.7	
Level of Service	E	D		E	D	C	E	F		F	B	
Approach Delay (s)		53.0			46.1			125.1			72.4	
Approach LOS		D			D			F			E	

Intersection Summary			
HCM 2000 Control Delay	84.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.7
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1: College Blvd & Old Grove Rd

2/3/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	70	430	130	170	40	300	630	40	30	1150	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7		4.6	5.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1568	1770	1863	1552	3433	3507		1770	3441	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1568	1770	1863	1552	3433	3507		1770	3441	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	31	71	439	133	173	41	306	643	41	31	1173	235
RTOR Reduction (vph)	0	0	94	0	0	34	0	3	0	0	14	0
Lane Group Flow (vph)	31	71	345	133	173	7	306	681	0	31	1394	0
Confl. Peds. (#/hr)			6			3						2
Confl. Bikes (#/hr)						2						1
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	3.7	11.9	27.2	9.7	17.9	17.9	15.3	64.0		4.2	51.8	
Effective Green, g (s)	3.7	11.9	27.2	9.7	17.9	17.9	15.3	64.0		4.2	51.8	
Actuated g/C Ratio	0.03	0.11	0.25	0.09	0.16	0.16	0.14	0.58		0.04	0.47	
Clearance Time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7		4.6	5.7	
Vehicle Extension (s)	2.5	3.0	2.5	2.5	3.0	3.0	2.5	3.5		2.5	3.5	
Lane Grp Cap (vph)	59	201	387	156	303	252	477	2040		67	1620	
v/s Ratio Prot	0.02	0.04	c0.12	c0.08	0.09		0.09	0.19		0.02	c0.41	
v/s Ratio Perm			0.10			0.00						
v/c Ratio	0.53	0.35	0.89	0.85	0.57	0.03	0.64	0.33		0.46	0.86	
Uniform Delay, d1	52.3	45.5	40.0	49.4	42.5	38.7	44.8	11.9		51.8	25.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.82	0.67		1.00	1.00	
Incremental Delay, d2	6.3	1.1	21.7	33.3	2.6	0.0	2.5	0.4		3.6	6.2	
Delay (s)	58.6	46.6	61.7	82.8	45.1	38.8	39.2	8.4		55.4	32.1	
Level of Service	E	D	E	F	D	D	D	A		E	C	
Approach Delay (s)		59.5			58.8			17.9			32.6	
Approach LOS		E			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	35.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	20	50	100	70	30	160	890	60	10	1540	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6		4.6	5.7		4.6	5.7	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1731	1561	1770	1778		1770	5031		1770	5001	
Flt Permitted	0.95	0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1731	1561	1770	1778		1770	5031		1770	5001	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	51	20	51	102	71	31	163	908	61	10	1571	163
RTOR Reduction (vph)	0	0	46	0	14	0	0	5	0	0	9	0
Lane Group Flow (vph)	35	36	5	102	88	0	163	964	0	10	1725	0
Confl. Peds. (#/hr)			2									2
Confl. Bikes (#/hr)									1			2
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7									
Actuated Green, G (s)	10.0	10.0	10.0	8.3	8.3		15.6	71.6		0.6	56.6	
Effective Green, g (s)	10.0	10.0	10.0	8.3	8.3		15.6	71.6		0.6	56.6	
Actuated g/C Ratio	0.09	0.09	0.09	0.08	0.08		0.14	0.65		0.01	0.51	
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6		4.6	5.7		4.6	5.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		2.5	4.0		2.5	4.0	
Lane Grp Cap (vph)	152	157	141	133	134		251	3274		9	2573	
v/s Ratio Prot	c0.02	0.02		c0.06	0.05		c0.09	0.19		0.01	c0.34	
v/s Ratio Perm			0.00									
v/c Ratio	0.23	0.23	0.03	0.77	0.66		0.65	0.29		1.11	0.67	
Uniform Delay, d1	46.4	46.4	45.6	49.9	49.5		44.6	8.3		54.7	19.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.88	0.46		0.82	0.75	
Incremental Delay, d2	0.8	0.7	0.1	22.8	11.1		4.9	0.2		247.6	0.7	
Delay (s)	47.2	47.2	45.7	72.7	60.5		44.2	4.1		292.3	15.5	
Level of Service	D	D	D	E	E		D	A		F	B	
Approach Delay (s)		46.6			66.6			9.8			17.1	
Approach LOS		D			E			A			B	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	40	10	10	80	20	1020	40	20	1660	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			0.89		1.00	0.99		1.00	1.00	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1662			1634		1770	5051		1770	5080	
Flt Permitted		0.96			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1612			1597		1770	5051		1770	5080	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	10	10	41	10	10	82	20	1041	41	20	1694	10
RTOR Reduction (vph)	0	36	0	0	72	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	25	0	0	30	0	20	1080	0	20	1704	0
Confl. Peds. (#/hr)			5			2	5		3	2		4
Confl. Bikes (#/hr)												2
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		13.8			13.8		2.5	82.2		2.0	81.7	
Effective Green, g (s)		13.8			13.8		2.5	82.2		2.0	81.7	
Actuated g/C Ratio		0.13			0.13		0.02	0.75		0.02	0.74	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		202			200		40	3774		32	3773	
v/s Ratio Prot							c0.01	0.21		0.01	c0.34	
v/s Ratio Perm		0.02			c0.02							
v/c Ratio		0.12			0.15		0.50	0.29		0.62	0.45	
Uniform Delay, d1		42.7			42.9		53.1	4.5		53.6	5.5	
Progression Factor		1.00			1.00		1.00	1.00		0.57	0.09	
Incremental Delay, d2		0.3			0.4		9.5	0.2		26.4	0.3	
Delay (s)		43.0			43.2		62.6	4.7		57.0	0.8	
Level of Service		D			D		E	A		E	A	
Approach Delay (s)		43.0			43.2			5.7			1.4	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	360	540	490	660	150	500	850	310	120	1620	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	6.0	5.0	7.0	7.0	6.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1573	3433	5085	1548	3433	5085	1554	3433	5085	1560
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1573	3433	5085	1548	3433	5085	1554	3433	5085	1560
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	92	367	551	500	673	153	510	867	316	122	1653	112
RTOR Reduction (vph)	0	0	88	0	0	115	0	0	164	0	0	71
Lane Group Flow (vph)	92	367	463	500	673	38	510	867	152	122	1653	41
Confl. Peds. (#/hr)			1			8			4			2
Confl. Bikes (#/hr)			2									
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	7.8	20.1	45.8	24.8	37.1	37.1	25.7	72.4	72.4	9.4	55.1	55.1
Effective Green, g (s)	7.8	20.1	45.8	24.8	37.1	37.1	25.7	72.4	72.4	9.4	55.1	55.1
Actuated g/C Ratio	0.05	0.13	0.30	0.16	0.25	0.25	0.17	0.48	0.48	0.06	0.37	0.37
Clearance Time (s)	5.0	7.0	6.0	5.0	7.0	7.0	6.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	3.0	3.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	177	678	478	564	1251	381	585	2442	746	214	1859	570
v/s Ratio Prot	0.03	0.07	c0.17	c0.15	0.13		0.15	0.17		0.04	c0.33	
v/s Ratio Perm			0.13			0.02			0.10			0.03
v/c Ratio	0.52	0.54	0.97	0.89	0.54	0.10	0.87	0.36	0.20	0.57	0.89	0.07
Uniform Delay, d1	69.6	61.0	51.8	61.6	49.4	43.9	60.9	24.5	22.5	68.7	44.9	31.1
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
Incremental Delay, d2	2.6	1.6	32.9	15.5	0.8	0.2	13.4	0.1	0.2	3.6	5.8	0.1
Delay (s)	72.2	62.5	84.6	77.0	50.2	44.1	74.3	24.6	22.7	72.3	50.7	31.2
Level of Service	E	E	F	E	D	D	E	C	C	E	D	C
Approach Delay (s)		75.5			59.6			39.3			51.0	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	53.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	150.7	Sum of lost time (s)	25.0
Intersection Capacity Utilization	93.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	10	10	210	10	820	10	1000	90	760	1800	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.91		0.97	0.91	
Frpb, ped/bikes		1.00	0.98		1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.97	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1797	1558		1773	2763	1770	5015		3433	5075	
Flt Permitted		0.78	1.00		0.71	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1451	1558		1326	2763	1770	5015		3433	5075	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	20	10	10	214	10	837	10	1020	92	776	1837	20
RTOR Reduction (vph)	0	0	8	0	0	42	0	8	0	0	1	0
Lane Group Flow (vph)	0	30	2	0	224	795	10	1104	0	776	1856	0
Confl. Peds. (#/hr)	6		3	3		6			2			7
Confl. Bikes (#/hr)			1						4			
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		23.9	23.9		23.9	54.9	0.6	40.2		31.0	70.6	
Effective Green, g (s)		23.9	23.9		23.9	54.9	0.6	40.2		31.0	70.6	
Actuated g/C Ratio		0.22	0.22		0.22	0.50	0.01	0.37		0.28	0.64	
Clearance Time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.5		3.0	3.5	
Lane Grp Cap (vph)		315	338		288	1494	9	1832		967	3257	
v/s Ratio Prot						0.15	c0.01	c0.22		c0.23	0.37	
v/s Ratio Perm		0.02	0.00		c0.17	0.14						
v/c Ratio		0.10	0.01		0.78	0.53	1.11	0.60		0.80	0.57	
Uniform Delay, d1		34.4	33.7		40.5	18.8	54.7	28.4		36.7	11.1	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1	0.0		12.4	0.4	342.2	1.5		4.9	0.7	
Delay (s)		34.5	33.8		53.0	19.2	396.9	29.9		41.5	11.9	
Level of Service		C	C		D	B	F	C		D	B	
Approach Delay (s)		34.3			26.3			33.1			20.6	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	30	40	90	10	230	20	820	40	310	1720	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.2		5.0	4.2	4.2	5.3		4.2	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	0.99		1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.97	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1804	1562		1782	1574	1770	5043		1770	5069	
Flt Permitted		0.77	1.00		0.68	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1429	1562		1260	1574	1770	5043		1770	5069	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	51	31	41	92	10	235	20	837	41	316	1755	31
RTOR Reduction (vph)	0	0	35	0	0	0	0	3	0	0	1	0
Lane Group Flow (vph)	0	82	6	0	102	235	20	875	0	316	1785	0
Confl. Peds. (#/hr)	2					2			2			3
Confl. Bikes (#/hr)			1						1			
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		16.8	16.8		16.0	40.3	2.7	56.0		24.3	77.6	
Effective Green, g (s)		16.8	16.8		16.0	40.3	2.7	56.0		24.3	77.6	
Actuated g/C Ratio		0.15	0.15		0.14	0.36	0.02	0.51		0.22	0.70	
Clearance Time (s)		4.2	4.2		5.0	4.2	4.2	5.3		4.2	5.3	
Vehicle Extension (s)		3.0	3.0		3.5	2.0	2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		216	236		181	572	43	2548		388	3550	
v/s Ratio Prot						0.09	0.01	c0.17		c0.18	c0.35	
v/s Ratio Perm		0.06	0.00		c0.08	0.06						
v/c Ratio		0.38	0.03		0.56	0.41	0.47	0.34		0.81	0.50	
Uniform Delay, d1		42.3	40.0		44.1	26.4	53.3	16.4		41.1	7.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.1	0.0		4.3	0.2	2.9	0.4		11.7	0.5	
Delay (s)		43.4	40.1		48.5	26.5	56.2	16.8		52.9	8.2	
Level of Service		D	D		D	C	E	B		D	A	
Approach Delay (s)		42.3			33.2			17.6			14.9	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	110.8	Sum of lost time (s)	14.5
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	30	950	50	40	1830
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	31	969	51	41	1867
Pedestrians	4					4
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1703	357			1024	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1703	357			1024	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	95			94	
cM capacity (veh/h)	77	636			671	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	31	388	388	245	41	622	622	622
Volume Left	0	0	0	0	41	0	0	0
Volume Right	31	0	0	51	0	0	0	0
cSH	636	1700	1700	1700	671	1700	1700	1700
Volume to Capacity	0.05	0.23	0.23	0.14	0.06	0.37	0.37	0.37
Queue Length 95th (ft)	4	0	0	0	5	0	0	0
Control Delay (s)	11.0	0.0	0.0	0.0	10.7	0.0	0.0	0.0
Lane LOS	B				B			
Approach Delay (s)	11.0	0.0			0.2			
Approach LOS	B							

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	90	130	30	910	1770	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6		4.2	6.5	6.5	
Lane Util. Factor	1.00		1.00	0.91	0.91	
Frpb, ped/bikes	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.92		1.00	1.00	1.00	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1680		1770	5085	5055	
Flt Permitted	0.98		0.95	1.00	1.00	
Satd. Flow (perm)	1680		1770	5085	5055	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	92	133	31	929	1806	61
RTOR Reduction (vph)	63	0	0	0	2	0
Lane Group Flow (vph)	162	0	31	929	1865	0
Confl. Peds. (#/hr)						4
Turn Type	Prot		Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases						
Actuated Green, G (s)	16.3		3.7	72.6	64.7	
Effective Green, g (s)	16.3		3.7	72.6	64.7	
Actuated g/C Ratio	0.16		0.04	0.73	0.65	
Clearance Time (s)	4.6		4.2	6.5	6.5	
Vehicle Extension (s)	3.0		3.0	4.0	4.0	
Lane Grp Cap (vph)	273		65	3691	3270	
v/s Ratio Prot	c0.10		c0.02	0.18	c0.37	
v/s Ratio Perm						
v/c Ratio	0.59		0.48	0.25	0.57	
Uniform Delay, d1	38.8		47.2	4.6	9.9	
Progression Factor	1.00		0.58	0.32	1.00	
Incremental Delay, d2	3.4		5.4	0.2	0.7	
Delay (s)	42.2		32.6	1.6	10.6	
Level of Service	D		C	A	B	
Approach Delay (s)	42.2			2.6	10.6	
Approach LOS	D			A	B	

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

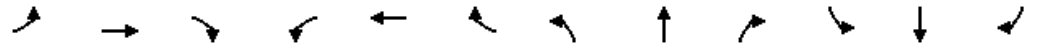
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	20	70	30	10	40	40	870	20	30	1770	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6		4.7	5.7		4.7	5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.88		1.00	0.88		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1628		1770	1638		1770	5066		1770	5057	
Flt Permitted	0.72	1.00		0.69	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1348	1628		1281	1638		1770	5066		1770	5057	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	31	20	71	31	10	41	41	888	20	31	1806	61
RTOR Reduction (vph)	0	63	0	0	37	0	0	1	0	0	2	0
Lane Group Flow (vph)	31	28	0	31	14	0	41	907	0	31	1865	0
Confl. Peds. (#/hr)			1						2			1
Confl. Bikes (#/hr)									2			
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	10.7	10.7		10.7	10.7		4.2	70.5		3.8	70.1	
Effective Green, g (s)	10.7	10.7		10.7	10.7		4.2	70.5		3.8	70.1	
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.04	0.70		0.04	0.70	
Clearance Time (s)	4.6	4.6		4.6	4.6		4.7	5.7		4.7	5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	144	174		137	175		74	3571		67	3544	
v/s Ratio Prot		0.02			0.01		c0.02	0.18		0.02	c0.37	
v/s Ratio Perm	0.02			c0.02								
v/c Ratio	0.22	0.16		0.23	0.08		0.55	0.25		0.46	0.53	
Uniform Delay, d1	40.8	40.6		40.9	40.2		47.0	5.3		47.1	7.1	
Progression Factor	1.00	1.00		1.00	1.00		1.08	0.25		0.84	0.27	
Incremental Delay, d2	0.8	0.4		0.8	0.2		7.7	0.2		4.4	0.5	
Delay (s)	41.6	41.0		41.7	40.4		58.3	1.5		43.7	2.4	
Level of Service	D	D		D	D		E	A		D	A	
Approach Delay (s)		41.1			40.9			3.9			3.1	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	50	160	140	40	90	400	790	170	180	1540	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0		4.6	5.7		4.6	6.7	
Lane Util. Factor		1.00	1.00	1.00	1.00		0.97	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.90		1.00	0.97		1.00	0.99	
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1817	1583	1770	1654		3433	4927		1770	5011	
Flt Permitted		0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1817	1583	1770	1654		3433	4927		1770	5011	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	51	51	163	143	41	92	408	806	173	184	1571	153
RTOR Reduction (vph)	0	0	108	0	76	0	0	29	0	0	10	0
Lane Group Flow (vph)	0	102	55	143	57	0	408	950	0	184	1714	0
Confl. Peds. (#/hr)			5						2			2
Confl. Bikes (#/hr)						1			1			
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4	4 5	3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		13.1	29.9	13.9	13.9		12.2	37.7		15.0	39.5	
Effective Green, g (s)		13.1	25.3	13.9	13.9		12.2	37.7		15.0	39.5	
Actuated g/C Ratio		0.13	0.25	0.14	0.14		0.12	0.38		0.15	0.40	
Clearance Time (s)		5.0		5.0	5.0		4.6	5.7		4.6	6.7	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)		238	400	246	229		418	1857		265	1979	
v/s Ratio Prot		c0.06	0.03	c0.08	0.03		c0.12	0.19		0.10	c0.34	
v/s Ratio Perm												
v/c Ratio		0.43	0.14	0.58	0.25		0.98	0.51		0.69	0.87	
Uniform Delay, d1		40.0	28.9	40.3	38.4		43.8	24.0		40.3	27.8	
Progression Factor		1.00	1.00	1.00	1.00		0.64	0.44		0.77	0.64	
Incremental Delay, d2		1.2	0.2	3.5	0.6		35.6	0.9		6.9	4.9	
Delay (s)		41.2	29.1	43.8	39.0		63.4	11.6		37.8	22.8	
Level of Service		D	C	D	D		E	B		D	C	
Approach Delay (s)		33.7			41.5			26.8			24.2	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	90	400	460	180	290	150	1020	800	40	1760	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	6.3	6.3	5.6	6.3	6.3	5.6	6.3	6.3	5.6	6.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	0.88	0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3539	1583	3433	3539	1560	3433	5085	2787	3433	5067	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	3539	1583	3433	3539	1560	3433	5085	2787	3433	5067	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	51	92	408	469	184	296	153	1041	816	41	1796	41
RTOR Reduction (vph)	0	0	191	0	0	176	0	0	321	0	2	0
Lane Group Flow (vph)	51	92	217	469	184	120	153	1041	495	41	1835	0
Confl. Peds. (#/hr)						2			10			
Confl. Bikes (#/hr)												1
Turn Type	Prot	NA	pt+ov	Prot	NA	Perm	Prot	NA	pt+ov	Prot	NA	
Protected Phases	7	4	4 5	3	8		5	2	2 3	1	6	
Permitted Phases						8						
Actuated Green, G (s)	8.5	12.6	18.7	18.4	22.5	22.5	6.1	42.2	66.2	3.0	39.1	
Effective Green, g (s)	8.5	12.6	18.7	18.4	22.5	22.5	6.1	42.2	60.6	3.0	39.1	
Actuated g/C Ratio	0.08	0.13	0.19	0.18	0.22	0.22	0.06	0.42	0.61	0.03	0.39	
Clearance Time (s)	5.6	6.3		5.6	6.3	6.3	5.6	6.3		5.6	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	291	445	296	631	796	351	209	2145	1688	102	1981	
v/s Ratio Prot	0.01	0.03	c0.14	c0.14	0.05		0.04	0.20	0.18	0.01	c0.36	
v/s Ratio Perm						0.08						
v/c Ratio	0.18	0.21	0.73	0.74	0.23	0.34	0.73	0.49	0.29	0.40	0.93	
Uniform Delay, d1	42.5	39.2	38.3	38.6	31.7	32.5	46.1	21.0	9.4	47.6	29.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.10	0.52	0.87	0.48	0.22	
Incremental Delay, d2	0.3	0.2	9.0	4.7	0.1	0.6	11.7	0.7	0.1	1.5	5.7	
Delay (s)	42.8	39.4	47.3	43.3	31.8	33.1	62.7	11.6	8.3	24.4	12.1	
Level of Service	D	D	D	D	C	C	E	B	A	C	B	
Approach Delay (s)		45.6			37.9			14.1			12.4	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	23.8
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	660	210	0	1310	2230	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		6.3	6.3	
Lane Util. Factor	0.97	1.00		0.86	0.81	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3433	1583		6408	7544	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3433	1583		6408	7544	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	673	214	0	1337	2276	0
RTOR Reduction (vph)	0	2	0	0	0	0
Lane Group Flow (vph)	673	212	0	1337	2276	0
Confl. Bikes (#/hr)						1
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	24.6	24.6		63.5	63.5	
Effective Green, g (s)	24.6	24.6		63.5	63.5	
Actuated g/C Ratio	0.25	0.25		0.64	0.64	
Clearance Time (s)	5.6	5.6		6.3	6.3	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	844	389		4069	4790	
v/s Ratio Prot	c0.20			0.21	c0.30	
v/s Ratio Perm		0.13				
v/c Ratio	0.80	0.55		0.33	0.48	
Uniform Delay, d1	35.4	32.8		8.4	9.5	
Progression Factor	1.00	1.00		0.75	0.51	
Incremental Delay, d2	4.9	0.8		0.2	0.2	
Delay (s)	40.3	33.7		6.5	5.1	
Level of Service	D	C		A	A	
Approach Delay (s)	38.7			6.5	5.1	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

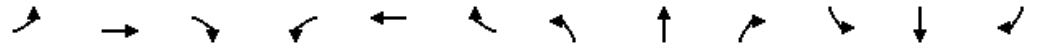
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	20	10	110	20	270	50	980	300	700	1670	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		4.2	5.6	5.6	5.2	5.3	5.3	5.2	5.3	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.91	1.00	0.97	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1762		1770	1863	1583	1770	5085	1546	3433	5050	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1762		1770	1863	1583	1770	5085	1546	3433	5050	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	61	20	10	112	20	276	51	1000	306	714	1704	71
RTOR Reduction (vph)	0	9	0	0	0	94	0	0	142	0	3	0
Lane Group Flow (vph)	61	21	0	112	20	182	51	1000	164	714	1772	0
Confl. Peds. (#/hr)			1						7			1
Confl. Bikes (#/hr)									2			1
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8	8 1	5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	6.8	9.8		10.4	12.0	34.9	6.1	36.6	36.6	22.9	53.4	
Effective Green, g (s)	6.8	9.8		10.4	12.0	34.9	6.1	36.6	36.6	22.9	53.4	
Actuated g/C Ratio	0.07	0.10		0.10	0.12	0.35	0.06	0.37	0.37	0.23	0.53	
Clearance Time (s)	5.6	5.6		4.2	5.6		5.2	5.3	5.3	5.2	5.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	2.0	2.0	3.0	2.0	
Lane Grp Cap (vph)	120	172		184	223	552	107	1861	565	786	2696	
v/s Ratio Prot	0.03	0.01		c0.06	0.01	c0.11	0.03	c0.20		c0.21	c0.35	
v/s Ratio Perm									0.11			
v/c Ratio	0.51	0.12		0.61	0.09	0.33	0.48	0.54	0.29	0.91	0.66	
Uniform Delay, d1	45.0	41.2		42.9	39.1	23.9	45.4	25.0	22.5	37.5	16.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.62	0.39	
Incremental Delay, d2	3.4	0.3		5.6	0.2	0.4	3.3	1.1	1.3	13.0	1.1	
Delay (s)	48.3	41.5		48.5	39.3	24.3	48.7	26.1	23.8	36.4	7.7	
Level of Service	D	D		D	D	C	D	C	C	D	A	
Approach Delay (s)		46.1			31.7			26.5			15.9	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	21.7
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	180	480	90	100	50	350	1240	120	50	850	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7		4.6	5.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1573	1770	1863	1583	3433	3486		1770	3472	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1573	1770	1863	1583	3433	3486		1770	3472	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	204	184	490	92	102	51	357	1265	122	51	867	112
RTOR Reduction (vph)	0	0	72	0	0	46	0	5	0	0	7	0
Lane Group Flow (vph)	204	184	418	92	102	5	357	1382	0	51	972	0
Confl. Peds. (#/hr)			1									2
Confl. Bikes (#/hr)									2			2
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	18.8	20.6	45.9	11.2	13.0	13.0	25.3	71.4		6.6	51.6	
Effective Green, g (s)	18.8	20.6	45.9	11.2	13.0	13.0	25.3	71.4		6.6	51.6	
Actuated g/C Ratio	0.14	0.16	0.35	0.09	0.10	0.10	0.19	0.55		0.05	0.40	
Clearance Time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7		4.6	5.7	
Vehicle Extension (s)	2.5	3.0	2.5	2.5	3.0	3.0	2.5	3.5		2.5	3.5	
Lane Grp Cap (vph)	255	295	555	152	186	158	668	1914		89	1378	
v/s Ratio Prot	0.12	0.10	c0.15	0.05	c0.05		0.10	c0.40		0.03	c0.28	
v/s Ratio Perm			0.12			0.00						
v/c Ratio	0.80	0.62	0.75	0.61	0.55	0.03	0.53	0.72		0.57	0.71	
Uniform Delay, d1	53.8	51.1	37.0	57.3	55.7	52.8	47.1	21.9		60.3	32.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.56	0.23		1.00	1.00	
Incremental Delay, d2	15.8	4.1	5.4	5.6	3.3	0.1	0.5	2.0		7.1	3.1	
Delay (s)	69.6	55.2	42.5	62.9	59.0	52.9	26.9	7.1		67.4	35.9	
Level of Service	E	E	D	E	E	D	C	A		E	D	
Approach Delay (s)		51.4			59.2			11.1			37.4	
Approach LOS		D			E			B			D	

Intersection Summary			
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	70	150	90	20	10	100	1590	180	20	1320	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6		4.6	5.7		4.6	5.7	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	0.99	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1749	1550	1770	1770		1770	4997		1770	5035	
Flt Permitted	0.95	0.99	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1749	1550	1770	1770		1770	4997		1770	5035	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	112	71	153	92	20	10	102	1622	184	20	1347	82
RTOR Reduction (vph)	0	0	136	0	9	0	0	8	0	0	4	0
Lane Group Flow (vph)	90	93	17	92	21	0	102	1798	0	20	1425	0
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			1						2			2
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7									
Actuated Green, G (s)	14.3	14.3	14.3	11.6	11.6		14.8	81.0		3.6	69.8	
Effective Green, g (s)	14.3	14.3	14.3	11.6	11.6		14.8	81.0		3.6	69.8	
Actuated g/C Ratio	0.11	0.11	0.11	0.09	0.09		0.11	0.62		0.03	0.54	
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6		4.6	5.7		4.6	5.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		2.5	4.0		2.5	4.0	
Lane Grp Cap (vph)	184	192	170	157	157		201	3113		49	2703	
v/s Ratio Prot	c0.05	0.05		c0.05	0.01		c0.06	c0.36		0.01	0.28	
v/s Ratio Perm			0.01									
v/c Ratio	0.49	0.48	0.10	0.59	0.13		0.51	0.58		0.41	0.53	
Uniform Delay, d1	54.4	54.4	52.1	56.9	54.6		54.2	14.4		62.2	19.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.86	0.10		0.89	0.71	
Incremental Delay, d2	2.0	1.9	0.3	5.5	0.4		1.3	0.7		2.7	0.5	
Delay (s)	56.5	56.3	52.3	62.4	55.0		48.1	2.2		57.9	14.2	
Level of Service	E	E	D	E	D		D	A		E	B	
Approach Delay (s)		54.5			60.6			4.7			14.8	
Approach LOS		D			E			A			B	

Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	30	10	10	50	40	1810	50	30	1510	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.99			0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.92			0.90		1.00	1.00		1.00	1.00	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1669			1637		1770	5054		1770	5072	
Flt Permitted		0.96			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1611			1582		1770	5054		1770	5072	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	10	10	31	10	10	51	41	1847	51	31	1541	20
RTOR Reduction (vph)	0	28	0	0	46	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	23	0	0	25	0	41	1897	0	31	1561	0
Confl. Peds. (#/hr)			13			17	13		21	17		9
Confl. Bikes (#/hr)									4			1
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		12.7			12.7		6.4	101.7		3.6	98.9	
Effective Green, g (s)		12.7			12.7		6.4	101.7		3.6	98.9	
Actuated g/C Ratio		0.10			0.10		0.05	0.78		0.03	0.76	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		157			154		87	3953		49	3858	
v/s Ratio Prot							0.02	c0.38		0.02	c0.31	
v/s Ratio Perm		0.01			c0.02							
v/c Ratio		0.15			0.16		0.47	0.48		0.63	0.40	
Uniform Delay, d1		53.7			53.8		60.2	4.9		62.5	5.4	
Progression Factor		1.00			1.00		1.27	0.53		0.64	0.13	
Incremental Delay, d2		0.4			0.5		2.1	0.2		21.2	0.3	
Delay (s)		54.1			54.3		78.3	2.8		61.2	1.0	
Level of Service		D			D		E	A		E	A	
Approach Delay (s)		54.1			54.3			4.4			2.2	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	370	830	640	530	690	250	410	1450	400	330	1160	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	6.0	5.0	7.0	7.0	6.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1558	3433	5085	1533	3433	5085	1547	3433	5085	1528
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1558	3433	5085	1533	3433	5085	1547	3433	5085	1528
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	378	847	653	541	704	255	418	1480	408	337	1184	153
RTOR Reduction (vph)	0	0	72	0	0	170	0	0	208	0	0	112
Lane Group Flow (vph)	378	847	581	541	704	85	418	1480	200	337	1184	41
Confl. Peds. (#/hr)			11			18			8			18
Confl. Bikes (#/hr)			2									
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	16.6	30.9	49.9	20.0	34.3	34.3	19.0	40.5	40.5	14.6	35.1	35.1
Effective Green, g (s)	16.6	30.9	49.9	20.0	34.3	34.3	19.0	40.5	40.5	14.6	35.1	35.1
Actuated g/C Ratio	0.13	0.24	0.38	0.15	0.26	0.26	0.15	0.31	0.31	0.11	0.27	0.27
Clearance Time (s)	5.0	7.0	6.0	5.0	7.0	7.0	6.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	3.0	3.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	438	1208	598	528	1341	404	501	1584	481	385	1372	412
v/s Ratio Prot	0.11	0.17	c0.14	c0.16	c0.14		0.12	c0.29		0.10	c0.23	
v/s Ratio Perm			0.23			0.06			0.13			0.03
v/c Ratio	0.86	0.70	0.97	1.02	0.52	0.21	0.83	0.93	0.42	0.88	0.86	0.10
Uniform Delay, d1	55.6	45.3	39.3	55.0	40.9	37.3	54.0	43.5	35.4	56.8	45.2	35.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.73	0.73	1.21
Incremental Delay, d2	16.0	2.3	29.5	45.6	0.7	0.5	11.4	11.6	2.6	18.6	7.0	0.5
Delay (s)	71.5	47.7	68.9	100.6	41.6	37.8	65.4	55.1	38.0	60.2	39.8	43.6
Level of Service	E	D	E	F	D	D	E	E	D	E	D	D
Approach Delay (s)		59.9			62.2			53.9			44.3	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	54.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	95.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	10	100	10	730	20	1760	170	860	1320	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.91		0.97	0.91	
Frpb, ped/bikes		1.00	0.98		1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1814	1553		1778	2771	1770	5010		3433	5070	
Flt Permitted		0.87	1.00		0.73	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1612	1553		1358	2771	1770	5010		3433	5070	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	10	10	10	102	10	745	20	1796	173	878	1347	20
RTOR Reduction (vph)	0	0	9	0	0	36	0	7	0	0	1	0
Lane Group Flow (vph)	0	20	1	0	112	709	20	1962	0	878	1366	0
Confl. Peds. (#/hr)	3		2	2		3			5			8
Confl. Bikes (#/hr)			3									3
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		18.2	18.2		18.2	54.3	2.7	60.8		36.1	94.2	
Effective Green, g (s)		18.2	18.2		18.2	54.3	2.7	60.8		36.1	94.2	
Actuated g/C Ratio		0.14	0.14		0.14	0.42	0.02	0.47		0.28	0.72	
Clearance Time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.5		3.0	3.5	
Lane Grp Cap (vph)		225	217		190	1255	36	2343		953	3673	
v/s Ratio Prot						c0.16	0.01	c0.39		c0.26	0.27	
v/s Ratio Perm		0.01	0.00		0.08	0.10						
v/c Ratio		0.09	0.01		0.59	0.57	0.56	0.84		0.92	0.37	
Uniform Delay, d1		48.7	48.1		52.4	28.9	63.1	30.3		45.6	6.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2	0.0		4.6	0.6	17.3	3.8		13.9	0.3	
Delay (s)		48.9	48.1		57.0	29.4	80.3	34.0		59.4	7.0	
Level of Service		D	D		E	C	F	C		E	A	
Approach Delay (s)		48.6			33.0			34.5			27.5	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	20	30	60	30	360	40	1530	70	270	1170	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.2		5.0	4.2	4.2	5.3		4.2	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	0.98		1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1795	1546		1800	1572	1770	5046		1770	5042	
Flt Permitted		0.76	1.00		0.76	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1415	1546		1419	1572	1770	5046		1770	5042	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	41	20	31	61	31	367	41	1561	71	276	1194	71
RTOR Reduction (vph)	0	0	27	0	0	0	0	3	0	0	4	0
Lane Group Flow (vph)	0	61	4	0	92	367	41	1629	0	276	1261	0
Confl. Peds. (#/hr)	4		5	2		4			2			
Confl. Bikes (#/hr)			3						1			
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		16.6	16.6		15.8	40.5	6.0	75.5		24.7	94.2	
Effective Green, g (s)		16.6	16.6		15.8	40.5	6.0	75.5		24.7	94.2	
Actuated g/C Ratio		0.13	0.13		0.12	0.31	0.05	0.58		0.19	0.72	
Clearance Time (s)		4.2	4.2		5.0	4.2	4.2	5.3		4.2	5.3	
Vehicle Extension (s)		3.0	3.0		3.5	2.0	2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		179	196		171	487	81	2919		335	3639	
v/s Ratio Prot						c0.14	0.02	c0.32		c0.16	0.25	
v/s Ratio Perm		0.04	0.00		0.06	0.09						
v/c Ratio		0.34	0.02		0.54	0.75	0.51	0.56		0.82	0.35	
Uniform Delay, d1		52.0	49.8		53.9	40.5	60.8	17.1		50.8	6.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.1	0.0		3.6	5.8	1.8	0.8		14.4	0.3	
Delay (s)		53.1	49.9		57.6	46.3	62.6	17.9		65.2	7.0	
Level of Service		D	D		E	D	E	B		E	A	
Approach Delay (s)		52.0			48.6			19.0			17.4	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	130.5	Sum of lost time (s)	14.5
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	30	1640	100	50	1230
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	31	1673	102	51	1255
Pedestrians	5					4
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			350			
pX, platoon unblocked	0.88	0.88			0.88	
vC, conflicting volume	2250	618			1781	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1947	95			1414	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			88	
cM capacity (veh/h)	44	825			419	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	31	669	669	437	51	418	418	418
Volume Left	0	0	0	0	51	0	0	0
Volume Right	31	0	0	102	0	0	0	0
cSH	825	1700	1700	1700	419	1700	1700	1700
Volume to Capacity	0.04	0.39	0.39	0.26	0.12	0.25	0.25	0.25
Queue Length 95th (ft)	3	0	0	0	10	0	0	0
Control Delay (s)	9.5	0.0	0.0	0.0	14.8	0.0	0.0	0.0
Lane LOS	A				B			
Approach Delay (s)	9.5	0.0			0.6			
Approach LOS	A							

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	80	70	130	1660	1140	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6		4.2	6.5	6.5	
Lane Util. Factor	1.00		1.00	0.91	0.91	
Frpb, ped/bikes	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.94		1.00	1.00	0.99	
Flt Protected	0.97		0.95	1.00	1.00	
Satd. Flow (prot)	1700		1770	5085	5018	
Flt Permitted	0.97		0.95	1.00	1.00	
Satd. Flow (perm)	1700		1770	5085	5018	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	82	71	133	1694	1163	92
RTOR Reduction (vph)	35	0	0	0	6	0
Lane Group Flow (vph)	118	0	133	1694	1249	0
Confl. Peds. (#/hr)						3
Confl. Bikes (#/hr)						2
Turn Type	Prot		Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases						
Actuated Green, G (s)	15.1		18.8	83.8	60.8	
Effective Green, g (s)	15.1		18.8	83.8	60.8	
Actuated g/C Ratio	0.14		0.17	0.76	0.55	
Clearance Time (s)	4.6		4.2	6.5	6.5	
Vehicle Extension (s)	3.0		3.0	4.0	4.0	
Lane Grp Cap (vph)	233		302	3873	2773	
v/s Ratio Prot	c0.07		0.08	c0.33	0.25	
v/s Ratio Perm						
v/c Ratio	0.51		0.44	0.44	0.45	
Uniform Delay, d1	44.0		40.9	4.7	14.6	
Progression Factor	1.00		0.75	0.13	1.00	
Incremental Delay, d2	1.7		1.0	0.3	0.5	
Delay (s)	45.8		31.6	0.9	15.2	
Level of Service	D		C	A	B	
Approach Delay (s)	45.8			3.2	15.2	
Approach LOS	D			A	B	

Intersection Summary			
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	20	60	40	20	40	90	1650	60	40	1130	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6		4.7	5.7		4.7	5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.90		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1652		1770	1659		1770	5054		1770	5054	
Flt Permitted	0.72	1.00		0.70	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1336	1652		1306	1659		1770	5054		1770	5054	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	20	20	61	41	20	41	92	1684	61	41	1153	41
RTOR Reduction (vph)	0	55	0	0	37	0	0	2	0	0	2	0
Lane Group Flow (vph)	20	26	0	41	24	0	92	1743	0	41	1192	0
Confl. Peds. (#/hr)									2			3
Confl. Bikes (#/hr)						1			1			2
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	11.3	11.3		11.3	11.3		9.6	78.7		5.0	74.1	
Effective Green, g (s)	11.3	11.3		11.3	11.3		9.6	78.7		5.0	74.1	
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.09	0.72		0.05	0.67	
Clearance Time (s)	4.6	4.6		4.6	4.6		4.7	5.7		4.7	5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	137	169		134	170		154	3615		80	3404	
v/s Ratio Prot		0.02			0.01		c0.05	c0.34		c0.02	0.24	
v/s Ratio Perm	0.01			c0.03								
v/c Ratio	0.15	0.16		0.31	0.14		0.60	0.48		0.51	0.35	
Uniform Delay, d1	45.0	45.0		45.7	44.9		48.3	6.8		51.3	7.7	
Progression Factor	1.00	1.00		1.00	1.00		1.34	0.34		0.66	0.16	
Incremental Delay, d2	0.5	0.4		1.3	0.4		3.3	0.2		5.0	0.3	
Delay (s)	45.4	45.4		47.0	45.3		68.0	2.6		39.0	1.5	
Level of Service	D	D		D	D		E	A		D	A	
Approach Delay (s)		45.4			46.0			5.8			2.7	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	60	410	160	80	210	400	1440	200	130	990	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0		4.6	5.7		4.6	6.7	
Lane Util. Factor		1.00	1.00	1.00	1.00		0.97	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.89		1.00	0.98		1.00	0.99	
Flt Protected		0.97	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1798	1583	1770	1644		3433	4975		1770	4995	
Flt Permitted		0.97	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1798	1583	1770	1644		3433	4975		1770	4995	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	153	61	418	163	82	214	408	1469	204	133	1010	112
RTOR Reduction (vph)	0	0	89	0	86	0	0	15	0	0	11	0
Lane Group Flow (vph)	0	214	329	163	211	0	408	1658	0	133	1111	0
Confl. Peds. (#/hr)			17						2			8
Confl. Bikes (#/hr)						1			1			1
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4	4 5	3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		19.3	35.9	15.0	15.0		16.6	43.3		12.1	37.8	
Effective Green, g (s)		19.3	35.9	15.0	15.0		16.6	43.3		12.1	37.8	
Actuated g/C Ratio		0.18	0.33	0.14	0.14		0.15	0.39		0.11	0.34	
Clearance Time (s)		5.0		5.0	5.0		4.6	5.7		4.6	6.7	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)		315	516	241	224		518	1958		194	1716	
v/s Ratio Prot		c0.12	0.21	0.09	c0.13		0.12	c0.33		0.08	c0.22	
v/s Ratio Perm												
v/c Ratio		0.68	0.64	0.68	0.94		0.79	0.85		0.69	0.65	
Uniform Delay, d1		42.5	31.5	45.2	47.1		45.0	30.3		47.1	30.5	
Progression Factor		1.00	1.00	1.00	1.00		0.67	0.48		0.81	0.59	
Incremental Delay, d2		5.7	2.6	7.3	43.0		6.1	3.7		9.3	1.8	
Delay (s)		48.2	34.1	52.5	90.1		36.3	18.3		47.5	19.7	
Level of Service		D	C	D	F		D	B		D	B	
Approach Delay (s)		38.9			76.7			21.8			22.6	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	140	400	530	320	360	370	1580	790	40	1440	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	6.3	6.3	5.6	6.3	6.3	5.6	6.3	6.3	5.6	6.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	0.88	0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3539	1583	3433	3539	1560	3433	5085	2787	3433	5041	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	3539	1583	3433	3539	1560	3433	5085	2787	3433	5041	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	102	143	408	541	327	367	378	1612	806	41	1469	82
RTOR Reduction (vph)	0	0	163	0	0	170	0	0	151	0	6	0
Lane Group Flow (vph)	102	143	245	541	327	197	378	1612	655	41	1545	0
Confl. Peds. (#/hr)						2			12			
Confl. Bikes (#/hr)												2
Turn Type	Prot	NA	pt+ov	Prot	NA	Perm	Prot	NA	pt+ov	Prot	NA	
Protected Phases	7	4	4 5	3	8		5	2	2 3	1	6	
Permitted Phases						8						
Actuated Green, G (s)	11.8	11.5	25.7	19.6	19.3	19.3	14.2	52.1	77.3	3.0	40.9	
Effective Green, g (s)	11.8	11.5	25.7	19.6	19.3	19.3	14.2	52.1	71.7	3.0	40.9	
Actuated g/C Ratio	0.11	0.10	0.23	0.18	0.18	0.18	0.13	0.47	0.65	0.03	0.37	
Clearance Time (s)	5.6	6.3		5.6	6.3	6.3	5.6	6.3		5.6	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	368	369	369	611	620	273	443	2408	1816	93	1874	
v/s Ratio Prot	0.03	0.04	0.15	c0.16	0.09		c0.11	0.32	0.23	0.01	c0.31	
v/s Ratio Perm						c0.13						
v/c Ratio	0.28	0.39	0.66	0.89	0.53	0.72	0.85	0.67	0.36	0.44	0.82	
Uniform Delay, d1	45.2	46.0	38.2	44.1	41.2	42.8	46.9	22.3	8.7	52.7	31.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.84	1.11	1.02	0.73	0.60	
Incremental Delay, d2	0.4	0.7	4.4	14.4	0.8	9.1	13.0	1.3	0.1	2.5	3.3	
Delay (s)	45.6	46.6	42.7	58.5	42.0	51.9	52.3	26.1	9.0	40.8	22.0	
Level of Service	D	D	D	E	D	D	D	C	A	D	C	
Approach Delay (s)		44.0			52.2			24.7			22.4	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	23.8
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	710	370	0	2030	1970	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		6.3	6.3	
Lane Util. Factor	0.97	1.00		0.86	0.81	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3433	1583		6408	7544	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3433	1583		6408	7544	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	724	378	0	2071	2010	0
RTOR Reduction (vph)	0	3	0	0	0	0
Lane Group Flow (vph)	724	375	0	2071	2010	0
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	31.7	31.7		66.4	66.4	
Effective Green, g (s)	31.7	31.7		66.4	66.4	
Actuated g/C Ratio	0.29	0.29		0.60	0.60	
Clearance Time (s)	5.6	5.6		6.3	6.3	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	989	456		3868	4553	
v/s Ratio Prot	0.21			c0.32	0.27	
v/s Ratio Perm		c0.24				
v/c Ratio	0.73	0.82		0.54	0.44	
Uniform Delay, d1	35.3	36.5		12.8	11.8	
Progression Factor	1.00	1.00		0.40	0.81	
Incremental Delay, d2	2.4	10.9		0.2	0.2	
Delay (s)	37.8	47.4		5.3	9.7	
Level of Service	D	D		A	A	
Approach Delay (s)	41.1			5.3	9.7	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	60	30	180	20	510	30	1310	320	800	1480	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6	5.6	5.2	5.3	5.3	5.2	5.3	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.91	1.00	0.97	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1754		1770	1863	1583	1770	5085	1535	3433	5052	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1754		1770	1863	1583	1770	5085	1535	3433	5052	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	214	61	31	184	20	520	31	1337	327	816	1510	61
RTOR Reduction (vph)	0	18	0	0	0	77	0	0	144	0	3	0
Lane Group Flow (vph)	214	74	0	184	20	443	31	1337	183	816	1568	0
Confl. Peds. (#/hr)			7						9			
Confl. Bikes (#/hr)			4						4			1
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8	8 1	5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	17.2	21.7		14.9	19.4	45.1	3.7	26.0	26.0	25.7	48.0	
Effective Green, g (s)	17.2	21.7		14.9	19.4	45.1	3.7	26.0	26.0	25.7	48.0	
Actuated g/C Ratio	0.16	0.20		0.14	0.18	0.41	0.03	0.24	0.24	0.23	0.44	
Clearance Time (s)	5.6	5.6		5.6	5.6		5.2	5.3	5.3	5.2	5.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	2.0	2.0	3.0	2.0	
Lane Grp Cap (vph)	276	346		239	328	649	59	1201	362	802	2204	
v/s Ratio Prot	c0.12	c0.04		0.10	0.01	c0.28	0.02	c0.26		c0.24	0.31	
v/s Ratio Perm									0.12			
v/c Ratio	0.78	0.21		0.77	0.06	0.68	0.53	1.11	0.51	1.02	0.71	
Uniform Delay, d1	44.5	37.0		45.9	37.7	26.6	52.3	42.0	36.4	42.1	25.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.79	0.39	
Incremental Delay, d2	12.8	0.3		13.9	0.1	3.0	8.2	62.9	5.0	34.6	1.8	
Delay (s)	57.3	37.3		59.8	37.8	29.5	60.5	104.9	41.4	67.7	11.6	
Level of Service	E	D		E	D	C	E	F	D	E	B	
Approach Delay (s)		51.3			37.4			91.8			30.8	
Approach LOS		D			D			F			C	

Intersection Summary			
HCM 2000 Control Delay	53.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.7
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1: College Blvd & Old Grove Rd

2/1/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	80	380	140	180	40	260	620	50	30	1230	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7		4.6	5.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1567	1770	1863	1552	3433	3500		1770	3440	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1567	1770	1863	1552	3433	3500		1770	3440	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	41	82	388	143	184	41	265	633	51	31	1255	255
RTOR Reduction (vph)	0	0	96	0	0	34	0	5	0	0	14	0
Lane Group Flow (vph)	41	82	292	143	184	7	265	679	0	31	1496	0
Confl. Peds. (#/hr)			6			3						2
Confl. Bikes (#/hr)						2						1
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	4.1	12.4	25.4	10.1	18.4	18.4	13.0	63.1		4.2	53.2	
Effective Green, g (s)	4.1	12.4	25.4	10.1	18.4	18.4	13.0	63.1		4.2	53.2	
Actuated g/C Ratio	0.04	0.11	0.23	0.09	0.17	0.17	0.12	0.57		0.04	0.48	
Clearance Time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7		4.6	5.7	
Vehicle Extension (s)	2.5	3.0	2.5	2.5	3.0	3.0	2.5	3.5		2.5	3.5	
Lane Grp Cap (vph)	65	210	361	162	311	259	405	2007		67	1663	
v/s Ratio Prot	0.02	0.04	c0.10	c0.08	0.10		0.08	0.19		0.02	c0.43	
v/s Ratio Perm			0.09			0.00						
v/c Ratio	0.63	0.39	0.81	0.88	0.59	0.03	0.65	0.34		0.46	0.90	
Uniform Delay, d1	52.2	45.3	40.0	49.4	42.3	38.3	46.4	12.4		51.8	26.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.88	0.86		1.00	1.00	
Incremental Delay, d2	16.1	1.2	12.2	38.8	3.0	0.0	3.3	0.4		3.6	8.2	
Delay (s)	68.3	46.5	52.2	88.1	45.3	38.4	44.3	11.2		55.4	34.2	
Level of Service	E	D	D	F	D	D	D	B		E	C	
Approach Delay (s)		52.6			61.2			20.4			34.6	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	36.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	20	40	100	60	20	160	870	60	10	1590	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6		4.6	5.7		4.6	5.7	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.99		1.00	0.99	
Flt Protected	0.95	0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1739	1561	1770	1794		1770	5030		1770	5008	
Flt Permitted	0.95	0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1739	1561	1770	1794		1770	5030		1770	5008	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	41	20	41	102	61	20	163	888	61	10	1622	153
RTOR Reduction (vph)	0	0	37	0	11	0	0	5	0	0	8	0
Lane Group Flow (vph)	30	31	4	102	70	0	163	944	0	10	1767	0
Confl. Peds. (#/hr)			2									2
Confl. Bikes (#/hr)									1			2
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7									
Actuated Green, G (s)	9.8	9.8	9.8	8.3	8.3		15.6	71.8		0.6	56.8	
Effective Green, g (s)	9.8	9.8	9.8	8.3	8.3		15.6	71.8		0.6	56.8	
Actuated g/C Ratio	0.09	0.09	0.09	0.08	0.08		0.14	0.65		0.01	0.52	
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6		4.6	5.7		4.6	5.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		2.5	4.0		2.5	4.0	
Lane Grp Cap (vph)	149	154	139	133	135		251	3283		9	2585	
v/s Ratio Prot	c0.02	0.02		c0.06	0.04		c0.09	0.19		0.01	c0.35	
v/s Ratio Perm			0.00									
v/c Ratio	0.20	0.20	0.03	0.77	0.52		0.65	0.29		1.11	0.68	
Uniform Delay, d1	46.5	46.5	45.7	49.9	48.9		44.6	8.2		54.7	19.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.88	0.46		0.85	0.70	
Incremental Delay, d2	0.7	0.6	0.1	22.8	3.3		4.9	0.2		245.0	0.7	
Delay (s)	47.1	47.1	45.8	72.7	52.3		44.2	4.0		291.8	14.7	
Level of Service	D	D	D	E	D		D	A		F	B	
Approach Delay (s)		46.6			63.7			9.9			16.2	
Approach LOS		D			E			A			B	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	40	10	10	80	20	1000	40	20	1700	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			0.89		1.00	0.99		1.00	1.00	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1662			1634		1770	5050		1770	5080	
Flt Permitted		0.96			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1612			1597		1770	5050		1770	5080	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	10	10	41	10	10	82	20	1020	41	20	1735	10
RTOR Reduction (vph)	0	36	0	0	72	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	25	0	0	30	0	20	1059	0	20	1745	0
Confl. Peds. (#/hr)			5			2	5		3	2		4
Confl. Bikes (#/hr)												2
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		13.8			13.8		2.5	82.2		2.0	81.7	
Effective Green, g (s)		13.8			13.8		2.5	82.2		2.0	81.7	
Actuated g/C Ratio		0.13			0.13		0.02	0.75		0.02	0.74	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		202			200		40	3773		32	3773	
v/s Ratio Prot							c0.01	0.21		0.01	c0.34	
v/s Ratio Perm		0.02			c0.02							
v/c Ratio		0.12			0.15		0.50	0.28		0.62	0.46	
Uniform Delay, d1		42.7			42.9		53.1	4.4		53.6	5.5	
Progression Factor		1.00			1.00		1.00	1.00		0.56	0.08	
Incremental Delay, d2		0.3			0.4		9.5	0.2		26.0	0.3	
Delay (s)		43.0			43.2		62.6	4.6		56.1	0.8	
Level of Service		D			D		E	A		E	A	
Approach Delay (s)		43.0			43.2			5.7			1.4	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	360	550	370	650	140	530	840	250	110	1640	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	6.0	5.0	7.0	7.0	6.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1573	3433	5085	1548	3433	5085	1554	3433	5085	1560
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1573	3433	5085	1548	3433	5085	1554	3433	5085	1560
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	92	367	561	378	663	143	541	857	255	112	1673	112
RTOR Reduction (vph)	0	0	85	0	0	112	0	0	125	0	0	69
Lane Group Flow (vph)	92	367	476	378	663	31	541	857	130	112	1673	43
Confl. Peds. (#/hr)			1			8			4			2
Confl. Bikes (#/hr)			2									
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	7.8	20.7	48.0	19.0	31.9	31.9	27.3	76.0	76.0	9.3	57.0	57.0
Effective Green, g (s)	7.8	20.7	48.0	19.0	31.9	31.9	27.3	76.0	76.0	9.3	57.0	57.0
Actuated g/C Ratio	0.05	0.14	0.32	0.13	0.21	0.21	0.18	0.51	0.51	0.06	0.38	0.38
Clearance Time (s)	5.0	7.0	6.0	5.0	7.0	7.0	6.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	3.0	3.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	179	706	506	437	1088	331	628	2593	792	214	1945	596
v/s Ratio Prot	0.03	0.07	c0.17	c0.11	0.13		0.16	0.17		0.03	c0.33	
v/s Ratio Perm			0.13			0.02			0.08			0.03
v/c Ratio	0.51	0.52	0.94	0.86	0.61	0.09	0.86	0.33	0.16	0.52	0.86	0.07
Uniform Delay, d1	68.8	59.5	49.1	63.7	52.9	46.9	59.0	21.5	19.5	67.7	42.3	29.2
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
Incremental Delay, d2	2.5	1.3	25.5	16.2	1.4	0.3	11.7	0.1	0.1	2.3	4.3	0.1
Delay (s)	71.2	60.8	74.5	79.9	54.4	47.2	70.7	21.6	19.7	70.0	46.6	29.3
Level of Service	E	E	E	E	D	D	E	C	B	E	D	C
Approach Delay (s)		69.3			61.6			37.4			47.0	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	51.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	149.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	10	10	190	10	900	10	910	90	810	1600	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95		0.97	0.95	
Frpb, ped/bikes		1.00	0.98		1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.97	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1797	1557		1772	2765	1770	3486		3433	3531	
Flt Permitted		0.78	1.00		0.71	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1441	1557		1326	2765	1770	3486		3433	3531	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	20	10	10	194	10	918	10	929	92	827	1633	20
RTOR Reduction (vph)	0	0	8	0	0	43	0	6	0	0	1	0
Lane Group Flow (vph)	0	30	2	0	204	875	10	1015	0	827	1652	0
Confl. Peds. (#/hr)	6		3	3		6			2			7
Confl. Bikes (#/hr)			1						4			
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		21.1	21.1		21.1	52.8	0.6	42.3		31.7	73.4	
Effective Green, g (s)		21.1	21.1		21.1	52.8	0.6	42.3		31.7	73.4	
Actuated g/C Ratio		0.19	0.19		0.19	0.48	0.01	0.38		0.29	0.67	
Clearance Time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.5		3.0	3.5	
Lane Grp Cap (vph)		276	298		254	1442	9	1340		989	2356	
v/s Ratio Prot						0.17	c0.01	c0.29		c0.24	0.47	
v/s Ratio Perm		0.02	0.00		c0.15	0.14						
v/c Ratio		0.11	0.01		0.80	0.61	1.11	0.76		0.84	0.70	
Uniform Delay, d1		36.7	36.0		42.5	21.0	54.7	29.4		36.7	11.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2	0.0		16.6	0.7	342.2	4.0		6.2	1.8	
Delay (s)		36.9	36.0		59.0	21.7	396.9	33.4		43.0	13.2	
Level of Service		D	D		E	C	F	C		D	B	
Approach Delay (s)		36.6			28.5			37.0			23.1	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	82.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	30	40	80	10	220	10	740	20	310	1500	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.2		5.0	4.2	4.2	5.3		4.2	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		0.97	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1803	1561		1783	1575	1770	3523		1770	3523	
Flt Permitted		0.74	1.00		0.67	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1376	1561		1240	1575	1770	3523		1770	3523	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	51	31	41	82	10	224	10	755	20	316	1531	41
RTOR Reduction (vph)	0	0	36	0	0	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	82	5	0	92	224	10	774	0	316	1571	0
Confl. Peds. (#/hr)	2					2			2			3
Confl. Bikes (#/hr)			1						1			
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		13.2	13.2		12.4	36.7	0.8	59.6		24.3	83.1	
Effective Green, g (s)		13.2	13.2		12.4	36.7	0.8	59.6		24.3	83.1	
Actuated g/C Ratio		0.12	0.12		0.11	0.33	0.01	0.54		0.22	0.75	
Clearance Time (s)		4.2	4.2		5.0	4.2	4.2	5.3		4.2	5.3	
Vehicle Extension (s)		3.0	3.0		3.5	2.0	2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		163	185		138	521	12	1895		388	2642	
v/s Ratio Prot						0.09	c0.01	0.22		c0.18	c0.45	
v/s Ratio Perm		0.06	0.00		c0.07	0.05						
v/c Ratio		0.50	0.03		0.67	0.43	0.83	0.41		0.81	0.59	
Uniform Delay, d1		45.7	43.1		47.2	28.9	54.9	15.2		41.1	6.2	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.4	0.1		12.0	0.2	163.6	0.7		11.7	1.0	
Delay (s)		48.2	43.2		59.2	29.1	218.5	15.8		52.9	7.2	
Level of Service		D	D		E	C	F	B		D	A	
Approach Delay (s)		46.5			37.9			18.4			14.9	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	110.8	Sum of lost time (s)	14.5
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	30	760	40	60	1560
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	31	776	41	61	1592
Pedestrians	4					4
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			354			
pX, platoon unblocked	0.94	0.94			0.94	
vC, conflicting volume	1718	416			820	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1633	245			676	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			93	
cM capacity (veh/h)	80	704			852	

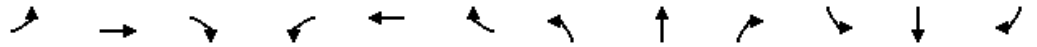
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	31	517	299	61	796	796
Volume Left	0	0	0	61	0	0
Volume Right	31	0	41	0	0	0
cSH	704	1700	1700	852	1700	1700
Volume to Capacity	0.04	0.30	0.18	0.07	0.47	0.47
Queue Length 95th (ft)	3	0	0	6	0	0
Control Delay (s)	10.3	0.0	0.0	9.6	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	10.3	0.0		0.4		
Approach LOS	B					

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	80	130	50	720	1580	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6		4.2	6.5	6.5	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frpb, ped/bikes	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.92		1.00	1.00	1.00	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1675		1770	3539	3520	
Flt Permitted	0.98		0.95	1.00	1.00	
Satd. Flow (perm)	1675		1770	3539	3520	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	82	133	51	735	1612	51
RTOR Reduction (vph)	65	0	0	0	2	0
Lane Group Flow (vph)	150	0	51	735	1661	0
Confl. Peds. (#/hr)						4
Turn Type	Prot		Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases						
Actuated Green, G (s)	14.4		4.6	74.5	65.7	
Effective Green, g (s)	14.4		4.6	74.5	65.7	
Actuated g/C Ratio	0.14		0.05	0.74	0.66	
Clearance Time (s)	4.6		4.2	6.5	6.5	
Vehicle Extension (s)	3.0		3.0	4.0	4.0	
Lane Grp Cap (vph)	241		81	2636	2312	
v/s Ratio Prot	c0.09		c0.03	0.21	c0.47	
v/s Ratio Perm						
v/c Ratio	0.62		0.63	0.28	0.72	
Uniform Delay, d1	40.2		46.9	4.1	11.1	
Progression Factor	1.00		0.66	0.72	1.00	
Incremental Delay, d2	4.9		14.0	0.3	2.0	
Delay (s)	45.2		44.9	3.2	13.1	
Level of Service	D		D	A	B	
Approach Delay (s)	45.2			5.9	13.1	
Approach LOS	D			A	B	

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	20	70	30	10	40	70	720	50	30	1640	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6		4.7	5.7		4.7	5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.88		1.00	0.88		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1628		1770	1638		1770	3499		1770	3521	
Flt Permitted	0.72	1.00		0.68	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1348	1628		1268	1638		1770	3499		1770	3521	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	20	20	71	31	10	41	71	735	51	31	1673	51
RTOR Reduction (vph)	0	64	0	0	37	0	0	3	0	0	2	0
Lane Group Flow (vph)	20	27	0	31	14	0	71	783	0	31	1722	0
Confl. Peds. (#/hr)			1						2			1
Confl. Bikes (#/hr)									2			
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	9.3	9.3		9.3	9.3		6.7	71.9		3.8	69.0	
Effective Green, g (s)	9.3	9.3		9.3	9.3		6.7	71.9		3.8	69.0	
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.07	0.72		0.04	0.69	
Clearance Time (s)	4.6	4.6		4.6	4.6		4.7	5.7		4.7	5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	125	151		117	152		118	2515		67	2429	
v/s Ratio Prot		0.02			0.01		c0.04	0.22		0.02	c0.49	
v/s Ratio Perm	0.01			c0.02								
v/c Ratio	0.16	0.18		0.26	0.09		0.60	0.31		0.46	0.71	
Uniform Delay, d1	41.8	41.8		42.2	41.5		45.4	5.1		47.1	9.4	
Progression Factor	1.00	1.00		1.00	1.00		1.18	0.28		0.97	0.17	
Incremental Delay, d2	0.6	0.6		1.2	0.3		7.8	0.3		3.8	1.4	
Delay (s)	42.4	42.4		43.4	41.7		61.3	1.7		49.6	3.0	
Level of Service	D	D		D	D		E	A		D	A	
Approach Delay (s)		42.4			42.4			6.7			3.8	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	50	170	140	50	50	380	750	160	100	1550	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0		4.6	5.7		4.6	6.7	
Lane Util. Factor		1.00	1.00	1.00	1.00		0.97	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.93		1.00	0.97		1.00	0.99	
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1822	1583	1770	1711		3433	4928		1770	5039	
Flt Permitted		0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1822	1583	1770	1711		3433	4928		1770	5039	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	41	51	173	143	51	51	388	765	163	102	1582	92
RTOR Reduction (vph)	0	0	108	0	34	0	0	28	0	0	5	0
Lane Group Flow (vph)	0	92	65	143	68	0	388	900	0	102	1669	0
Confl. Peds. (#/hr)			5						2			2
Confl. Bikes (#/hr)						1			1			
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4	4 5	3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		12.7	30.3	13.9	13.9		13.0	44.0		9.1	39.1	
Effective Green, g (s)		12.7	25.7	13.9	13.9		13.0	44.0		9.1	39.1	
Actuated g/C Ratio		0.13	0.26	0.14	0.14		0.13	0.44		0.09	0.39	
Clearance Time (s)		5.0		5.0	5.0		4.6	5.7		4.6	6.7	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)		231	406	246	237		446	2168		161	1970	
v/s Ratio Prot		c0.05	0.04	c0.08	0.04		c0.11	0.18		0.06	c0.33	
v/s Ratio Perm												
v/c Ratio		0.40	0.16	0.58	0.29		0.87	0.42		0.63	0.85	
Uniform Delay, d1		40.1	28.8	40.3	38.6		42.7	19.2		43.8	27.7	
Progression Factor		1.00	1.00	1.00	1.00		0.69	0.37		0.82	0.64	
Incremental Delay, d2		1.1	0.2	3.5	0.7		15.2	0.5		6.1	3.7	
Delay (s)		41.3	29.0	43.8	39.3		44.6	7.7		41.9	21.4	
Level of Service		D	C	D	D		D	A		D	C	
Approach Delay (s)		33.2			41.9			18.6			22.6	
Approach LOS		C			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	90	390	450	180	280	180	960	800	50	1770	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	6.3	6.3	5.6	6.3	6.3	5.6	6.3	6.3	5.6	6.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	0.88	0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3539	1583	3433	3539	1560	3433	5085	2787	3433	5067	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	3539	1583	3433	3539	1560	3433	5085	2787	3433	5067	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	51	92	398	459	184	286	184	980	816	51	1806	41
RTOR Reduction (vph)	0	0	137	0	0	168	0	0	314	0	2	0
Lane Group Flow (vph)	51	92	261	459	184	118	184	980	502	51	1845	0
Confl. Peds. (#/hr)						2			10			
Confl. Bikes (#/hr)												1
Turn Type	Prot	NA	pt+ov	Prot	NA	Perm	Prot	NA	pt+ov	Prot	NA	
Protected Phases	7	4	4 5	3	8		5	2	2 3	1	6	
Permitted Phases						8						
Actuated Green, G (s)	4.0	13.9	21.0	16.3	26.2	26.2	7.1	42.0	63.9	4.0	38.9	
Effective Green, g (s)	4.0	13.9	21.0	16.3	26.2	26.2	7.1	42.0	58.3	4.0	38.9	
Actuated g/C Ratio	0.04	0.14	0.21	0.16	0.26	0.26	0.07	0.42	0.58	0.04	0.39	
Clearance Time (s)	5.6	6.3		5.6	6.3	6.3	5.6	6.3		5.6	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	137	491	332	559	927	408	243	2135	1624	137	1971	
v/s Ratio Prot	0.01	0.03	c0.17	c0.13	0.05		0.05	0.19	0.18	0.01	c0.36	
v/s Ratio Perm						0.08						
v/c Ratio	0.37	0.19	0.79	0.82	0.20	0.29	0.76	0.46	0.31	0.37	0.94	
Uniform Delay, d1	46.8	38.1	37.4	40.4	28.7	29.5	45.6	20.8	10.6	46.8	29.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.91	2.98	0.50	0.26	
Incremental Delay, d2	1.7	0.2	11.7	9.4	0.1	0.4	12.0	0.7	0.1	1.1	6.9	
Delay (s)	48.5	38.2	49.0	49.9	28.8	29.9	53.8	19.6	31.7	24.6	14.5	
Level of Service	D	D	D	D	C	C	D	B	C	C	B	
Approach Delay (s)		47.2			39.5			27.8			14.8	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	23.8
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	640	210	0	1300	2220	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		6.3	6.3	
Lane Util. Factor	0.97	1.00		0.86	0.81	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3433	1583		6408	7544	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3433	1583		6408	7544	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	653	214	0	1327	2265	0
RTOR Reduction (vph)	0	2	0	0	0	0
Lane Group Flow (vph)	653	212	0	1327	2265	0
Confl. Bikes (#/hr)						1
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	23.9	23.9		64.2	64.2	
Effective Green, g (s)	23.9	23.9		64.2	64.2	
Actuated g/C Ratio	0.24	0.24		0.64	0.64	
Clearance Time (s)	5.6	5.6		6.3	6.3	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	820	378		4113	4843	
v/s Ratio Prot	c0.19			0.21	c0.30	
v/s Ratio Perm		0.13				
v/c Ratio	0.80	0.56		0.32	0.47	
Uniform Delay, d1	35.8	33.4		8.1	9.2	
Progression Factor	1.00	1.00		0.43	0.62	
Incremental Delay, d2	5.0	1.1		0.2	0.2	
Delay (s)	40.8	34.6		3.7	5.9	
Level of Service	D	C		A	A	
Approach Delay (s)	39.3			3.7	5.9	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	20	10	110	20	290	40	960	300	700	1640	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		4.2	5.6	5.6	5.2	5.3	5.3	5.2	5.3	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.91	1.00	0.97	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1762		1770	1863	1583	1770	5085	1546	3433	5039	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1762		1770	1863	1583	1770	5085	1546	3433	5039	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	51	20	10	112	20	296	41	980	306	714	1673	92
RTOR Reduction (vph)	0	9	0	0	0	92	0	0	155	0	5	0
Lane Group Flow (vph)	51	21	0	112	20	204	41	980	151	714	1760	0
Confl. Peds. (#/hr)			1						7			1
Confl. Bikes (#/hr)									2			1
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8	8 1	5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	10.2	8.4		13.4	10.2	36.0	3.1	32.1	32.1	25.8	54.8	
Effective Green, g (s)	10.2	8.4		13.4	10.2	36.0	3.1	32.1	32.1	25.8	54.8	
Actuated g/C Ratio	0.10	0.08		0.13	0.10	0.36	0.03	0.32	0.32	0.26	0.55	
Clearance Time (s)	5.6	5.6		4.2	5.6		5.2	5.3	5.3	5.2	5.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	2.0	2.0	3.0	2.0	
Lane Grp Cap (vph)	180	148		237	190	569	54	1632	496	885	2761	
v/s Ratio Prot	0.03	0.01		c0.06	0.01	c0.13	0.02	c0.19		c0.21	c0.35	
v/s Ratio Perm									0.10			
v/c Ratio	0.28	0.14		0.47	0.11	0.36	0.76	0.60	0.30	0.81	0.64	
Uniform Delay, d1	41.5	42.5		40.0	40.8	23.5	48.1	28.6	25.6	34.8	15.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.28	
Incremental Delay, d2	0.9	0.4		1.5	0.2	0.4	45.2	1.6	1.6	4.9	1.0	
Delay (s)	42.4	42.9		41.5	41.0	23.9	93.3	30.2	27.1	39.4	5.4	
Level of Service	D	D		D	D	C	F	C	C	D	A	
Approach Delay (s)		42.6			29.3			31.4			15.2	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	21.7
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1: College Blvd & Old Grove Rd

2/1/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	240	160	450	100	100	50	400	1300	130	50	880	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7		4.6	5.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1572	1770	1863	1583	3433	3484		1770	3474	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1572	1770	1863	1583	3433	3484		1770	3474	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	245	163	459	102	102	51	408	1327	133	51	898	112
RTOR Reduction (vph)	0	0	79	0	0	46	0	5	0	0	6	0
Lane Group Flow (vph)	245	163	380	102	102	5	408	1455	0	51	1004	0
Confl. Peds. (#/hr)			1									2
Confl. Bikes (#/hr)									2			2
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	21.0	22.1	43.1	12.0	13.1	13.1	21.0	69.1		6.6	53.6	
Effective Green, g (s)	21.0	22.1	43.1	12.0	13.1	13.1	21.0	69.1		6.6	53.6	
Actuated g/C Ratio	0.16	0.17	0.33	0.09	0.10	0.10	0.16	0.53		0.05	0.41	
Clearance Time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7		4.6	5.7	
Vehicle Extension (s)	2.5	3.0	2.5	2.5	3.0	3.0	2.5	3.5		2.5	3.5	
Lane Grp Cap (vph)	285	316	521	163	187	159	554	1851		89	1432	
v/s Ratio Prot	c0.14	0.09	c0.12	0.06	0.05		0.12	c0.42		0.03	c0.29	
v/s Ratio Perm			0.12			0.00						
v/c Ratio	0.86	0.52	0.73	0.63	0.55	0.03	0.74	0.79		0.57	0.70	
Uniform Delay, d1	53.1	49.1	38.3	56.8	55.6	52.7	51.9	24.5		60.3	31.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.59	0.23		1.00	1.00	
Incremental Delay, d2	21.6	1.4	4.8	6.3	3.2	0.1	4.0	2.9		7.1	2.9	
Delay (s)	74.7	50.5	43.1	63.2	58.8	52.8	34.7	8.4		67.4	34.5	
Level of Service	E	D	D	E	E	D	C	A		E	C	
Approach Delay (s)		53.4			59.4			14.2			36.0	
Approach LOS		D			E			B			D	

Intersection Summary			
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	70	150	90	30	10	110	1700	170	20	1330	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6		4.6	5.7		4.6	5.7	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.99		1.00	0.99	
Flt Protected	0.95	0.99	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1746	1550	1770	1795		1770	5006		1770	5036	
Flt Permitted	0.95	0.99	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1746	1550	1770	1795		1770	5006		1770	5036	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	122	71	153	92	31	10	112	1735	173	20	1357	82
RTOR Reduction (vph)	0	0	136	0	9	0	0	7	0	0	4	0
Lane Group Flow (vph)	95	98	17	92	32	0	112	1901	0	20	1435	0
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			1						2			2
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7									
Actuated Green, G (s)	14.5	14.5	14.5	11.4	11.4		15.4	81.1		3.5	69.2	
Effective Green, g (s)	14.5	14.5	14.5	11.4	11.4		15.4	81.1		3.5	69.2	
Actuated g/C Ratio	0.11	0.11	0.11	0.09	0.09		0.12	0.62		0.03	0.53	
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6		4.6	5.7		4.6	5.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		2.5	4.0		2.5	4.0	
Lane Grp Cap (vph)	187	194	172	155	157		209	3122		47	2680	
v/s Ratio Prot	c0.06	0.06		c0.05	0.02		c0.06	c0.38		0.01	0.28	
v/s Ratio Perm			0.01									
v/c Ratio	0.51	0.51	0.10	0.59	0.20		0.54	0.61		0.43	0.54	
Uniform Delay, d1	54.4	54.4	51.9	57.1	55.1		53.9	14.8		62.3	19.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.89	0.15		0.87	0.75	
Incremental Delay, d2	2.2	2.1	0.3	6.0	0.6		1.8	0.8		3.1	0.5	
Delay (s)	56.6	56.4	52.1	63.0	55.7		49.9	3.0		57.2	15.5	
Level of Service	E	E	D	E	E		D	A		E	B	
Approach Delay (s)		54.6			60.8			5.6			16.1	
Approach LOS		D			E			A			B	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	30	10	10	50	40	1920	50	30	1520	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.99			0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.92			0.90		1.00	1.00		1.00	1.00	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1669			1637		1770	5055		1770	5073	
Flt Permitted		0.96			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1611			1582		1770	5055		1770	5073	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	10	10	31	10	10	51	41	1959	51	31	1551	20
RTOR Reduction (vph)	0	28	0	0	46	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	23	0	0	25	0	41	2009	0	31	1571	0
Confl. Peds. (#/hr)			13			17	13		21	17		9
Confl. Bikes (#/hr)									4			1
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		12.7			12.7		6.4	101.7		3.6	98.9	
Effective Green, g (s)		12.7			12.7		6.4	101.7		3.6	98.9	
Actuated g/C Ratio		0.10			0.10		0.05	0.78		0.03	0.76	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		157			154		87	3954		49	3859	
v/s Ratio Prot							0.02	c0.40		0.02	c0.31	
v/s Ratio Perm		0.01			c0.02							
v/c Ratio		0.15			0.16		0.47	0.51		0.63	0.41	
Uniform Delay, d1		53.7			53.8		60.2	5.1		62.5	5.4	
Progression Factor		1.00			1.00		1.28	0.46		0.64	0.22	
Incremental Delay, d2		0.4			0.5		2.2	0.3		21.0	0.3	
Delay (s)		54.1			54.3		79.2	2.6		61.1	1.5	
Level of Service		D			D		E	A		E	A	
Approach Delay (s)		54.1			54.3			4.1			2.6	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	360	830	640	380	680	240	430	1490	290	310	1170	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	6.0	5.0	7.0	7.0	6.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1560	3433	5085	1533	3433	5085	1547	3433	5085	1528
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1560	3433	5085	1533	3433	5085	1547	3433	5085	1528
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	367	847	653	388	694	245	439	1520	296	316	1194	153
RTOR Reduction (vph)	0	0	68	0	0	168	0	0	172	0	0	112
Lane Group Flow (vph)	367	847	585	388	694	77	439	1520	124	316	1194	41
Confl. Peds. (#/hr)			11			18			8			18
Confl. Bikes (#/hr)			2									
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	14.0	30.9	53.9	16.0	32.9	32.9	23.0	45.1	45.1	14.0	35.1	35.1
Effective Green, g (s)	14.0	30.9	53.9	16.0	32.9	32.9	23.0	45.1	45.1	14.0	35.1	35.1
Actuated g/C Ratio	0.11	0.24	0.41	0.12	0.25	0.25	0.18	0.35	0.35	0.11	0.27	0.27
Clearance Time (s)	5.0	7.0	6.0	5.0	7.0	7.0	6.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	3.0	3.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	369	1208	646	422	1286	387	607	1764	536	369	1372	412
v/s Ratio Prot	0.11	0.17	c0.16	c0.11	0.14		0.13	c0.30		0.09	c0.23	
v/s Ratio Perm			0.21			0.05			0.08			0.03
v/c Ratio	0.99	0.70	0.90	0.92	0.54	0.20	0.72	0.86	0.23	0.86	0.87	0.10
Uniform Delay, d1	58.0	45.3	35.6	56.4	42.0	38.2	50.5	39.5	30.1	57.0	45.3	35.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.74	0.71	1.22
Incremental Delay, d2	45.1	2.3	16.2	24.8	0.8	0.5	4.3	5.8	1.0	16.7	7.4	0.5
Delay (s)	103.1	47.7	51.8	81.1	42.8	38.7	54.8	45.4	31.2	58.8	39.7	43.7
Level of Service	F	D	D	F	D	D	D	D	C	E	D	D
Approach Delay (s)		60.0			53.3			45.3			43.7	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	50.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	91.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	10	90	10	810	20	1600	150	920	1250	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95		0.97	0.95	
Frpb, ped/bikes		1.00	0.98		1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1814	1551		1778	2772	1770	3488		3433	3528	
Flt Permitted		0.86	1.00		0.73	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1606	1551		1361	2772	1770	3488		3433	3528	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	10	10	10	92	10	827	20	1633	153	939	1276	20
RTOR Reduction (vph)	0	0	9	0	0	38	0	5	0	0	1	0
Lane Group Flow (vph)	0	20	1	0	102	789	20	1781	0	939	1295	0
Confl. Peds. (#/hr)	3		2	2		3			5			8
Confl. Bikes (#/hr)			3									3
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		16.2	16.2		16.2	49.3	2.7	65.8		33.1	96.2	
Effective Green, g (s)		16.2	16.2		16.2	49.3	2.7	65.8		33.1	96.2	
Actuated g/C Ratio		0.12	0.12		0.12	0.38	0.02	0.51		0.25	0.74	
Clearance Time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.5		3.0	3.5	
Lane Grp Cap (vph)		200	193		169	1149	36	1765		874	2610	
v/s Ratio Prot						c0.17	0.01	c0.51		c0.27	0.37	
v/s Ratio Perm		0.01	0.00		0.07	0.11						
v/c Ratio		0.10	0.01		0.60	0.69	0.56	1.01		1.07	0.50	
Uniform Delay, d1		50.4	49.8		53.9	33.9	63.1	32.1		48.5	6.9	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2	0.0		6.0	1.7	17.3	23.7		52.5	0.7	
Delay (s)		50.7	49.9		59.8	35.6	80.3	55.8		100.9	7.6	
Level of Service		D	D		E	D	F	E		F	A	
Approach Delay (s)		50.4			38.3			56.0			46.8	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	48.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	20	30	60	30	350	50	1380	60	250	1040	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.2		5.0	4.2	4.2	5.3		4.2	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.97		1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1793	1542		1799	1570	1770	3513		1770	3510	
Flt Permitted		0.74	1.00		0.76	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1364	1542		1419	1570	1770	3513		1770	3510	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	41	20	31	61	31	357	51	1408	61	255	1061	61
RTOR Reduction (vph)	0	0	27	0	0	0	0	2	0	0	2	0
Lane Group Flow (vph)	0	61	4	0	92	357	51	1467	0	255	1120	0
Confl. Peds. (#/hr)	4		5	2		4			2			
Confl. Bikes (#/hr)			3						1			
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		15.2	15.2		14.4	36.9	6.9	79.1		22.5	94.7	
Effective Green, g (s)		15.2	15.2		14.4	36.9	6.9	79.1		22.5	94.7	
Actuated g/C Ratio		0.12	0.12		0.11	0.28	0.05	0.61		0.17	0.73	
Clearance Time (s)		4.2	4.2		5.0	4.2	4.2	5.3		4.2	5.3	
Vehicle Extension (s)		3.0	3.0		3.5	2.0	2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		158	179		156	443	93	2129		305	2547	
v/s Ratio Prot						c0.14	0.03	c0.42		c0.14	0.32	
v/s Ratio Perm		0.04	0.00		0.06	0.09						
v/c Ratio		0.39	0.02		0.59	0.81	0.55	0.69		0.84	0.44	
Uniform Delay, d1		53.3	51.1		55.2	43.5	60.3	17.4		52.2	7.2	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.6	0.0		6.0	9.7	3.5	1.8		17.0	0.6	
Delay (s)		54.9	51.1		61.2	53.2	63.8	19.2		69.2	7.8	
Level of Service		D	D		E	D	E	B		E	A	
Approach Delay (s)		53.6			54.8			20.7			19.1	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	130.5	Sum of lost time (s)	14.5
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	30	1480	70	40	1090
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	31	1510	71	41	1112
Pedestrians	5					4
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			350			
pX, platoon unblocked	0.83	0.83			0.83	
vC, conflicting volume	2189	800			1587	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2021	346			1295	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	94			91	
cM capacity (veh/h)	38	535			438	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	31	1007	575	41	556	556
Volume Left	0	0	0	41	0	0
Volume Right	31	0	71	0	0	0
cSH	535	1700	1700	438	1700	1700
Volume to Capacity	0.06	0.59	0.34	0.09	0.33	0.33
Queue Length 95th (ft)	5	0	0	8	0	0
Control Delay (s)	12.1	0.0	0.0	14.1	0.0	0.0
Lane LOS	B			B		
Approach Delay (s)	12.1	0.0		0.5		
Approach LOS	B					

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	54.4%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	70	70	180	1480	1020	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6		4.2	6.5	6.5	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frpb, ped/bikes	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.93		1.00	1.00	0.99	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1695		1770	3539	3493	
Flt Permitted	0.98		0.95	1.00	1.00	
Satd. Flow (perm)	1695		1770	3539	3493	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	71	71	184	1510	1041	82
RTOR Reduction (vph)	37	0	0	0	4	0
Lane Group Flow (vph)	105	0	184	1510	1119	0
Confl. Peds. (#/hr)						3
Confl. Bikes (#/hr)						2
Turn Type	Prot		Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases						
Actuated Green, G (s)	13.0		20.8	85.9	60.9	
Effective Green, g (s)	13.0		20.8	85.9	60.9	
Actuated g/C Ratio	0.12		0.19	0.78	0.55	
Clearance Time (s)	4.6		4.2	6.5	6.5	
Vehicle Extension (s)	3.0		3.0	4.0	4.0	
Lane Grp Cap (vph)	200		334	2763	1933	
v/s Ratio Prot	c0.06		0.10	c0.43	0.32	
v/s Ratio Perm						
v/c Ratio	0.52		0.55	0.55	0.58	
Uniform Delay, d1	45.6		40.4	4.6	16.1	
Progression Factor	1.00		0.73	0.11	1.00	
Incremental Delay, d2	2.5		1.6	0.6	1.3	
Delay (s)	48.1		30.9	1.1	17.4	
Level of Service	D		C	A	B	
Approach Delay (s)	48.1			4.4	17.4	
Approach LOS	D			A	B	

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	20	50	40	20	40	90	1600	80	40	1030	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6		4.7	5.7		4.7	5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.90		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1662		1770	1659		1770	3509		1770	3521	
Flt Permitted	0.72	1.00		0.71	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1336	1662		1324	1659		1770	3509		1770	3521	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	20	20	51	41	20	41	92	1633	82	41	1051	31
RTOR Reduction (vph)	0	46	0	0	37	0	0	2	0	0	1	0
Lane Group Flow (vph)	20	25	0	41	24	0	92	1713	0	41	1081	0
Confl. Peds. (#/hr)									2			3
Confl. Bikes (#/hr)						1			1			2
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	9.9	9.9		9.9	9.9		9.2	81.3		3.8	75.9	
Effective Green, g (s)	9.9	9.9		9.9	9.9		9.2	81.3		3.8	75.9	
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.08	0.74		0.03	0.69	
Clearance Time (s)	4.6	4.6		4.6	4.6		4.7	5.7		4.7	5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	120	149		119	149		148	2593		61	2429	
v/s Ratio Prot		0.01			0.01		0.05	c0.49		c0.02	0.31	
v/s Ratio Perm	0.01			c0.03								
v/c Ratio	0.17	0.17		0.34	0.16		0.62	0.66		0.67	0.44	
Uniform Delay, d1	46.2	46.2		47.0	46.2		48.7	7.3		52.5	7.6	
Progression Factor	1.00	1.00		1.00	1.00		1.46	0.52		0.66	0.10	
Incremental Delay, d2	0.7	0.5		1.7	0.5		5.4	0.9		21.9	0.5	
Delay (s)	46.9	46.8		48.7	46.7		76.5	4.7		56.8	1.2	
Level of Service	D	D		D	D		E	A		E	A	
Approach Delay (s)		46.8			47.5			8.4			3.3	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	60	410	150	80	120	410	1520	190	80	940	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0		4.6	5.7		4.6	6.7	
Lane Util. Factor		1.00	1.00	1.00	1.00		0.97	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.91		1.00	0.98		1.00	0.99	
Flt Protected		0.97	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1801	1583	1770	1681		3433	4985		1770	4998	
Flt Permitted		0.97	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1801	1583	1770	1681		3433	4985		1770	4998	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	133	61	418	153	82	122	418	1551	194	82	959	102
RTOR Reduction (vph)	0	0	88	0	49	0	0	12	0	0	11	0
Lane Group Flow (vph)	0	194	330	153	155	0	418	1733	0	82	1050	0
Confl. Peds. (#/hr)			17						2			8
Confl. Bikes (#/hr)						1			1			1
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4	4 5	3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		18.4	36.3	12.3	12.3		17.9	51.0		8.0	40.1	
Effective Green, g (s)		18.4	36.3	12.3	12.3		17.9	51.0		8.0	40.1	
Actuated g/C Ratio		0.17	0.33	0.11	0.11		0.16	0.46		0.07	0.36	
Clearance Time (s)		5.0		5.0	5.0		4.6	5.7		4.6	6.7	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)		301	522	197	187		558	2311		128	1821	
v/s Ratio Prot		c0.11	0.21	0.09	c0.09		0.12	c0.35		0.05	c0.21	
v/s Ratio Perm												
v/c Ratio		0.64	0.63	0.78	0.83		0.75	0.75		0.64	0.58	
Uniform Delay, d1		42.7	31.2	47.5	47.8		43.9	24.3		49.6	28.1	
Progression Factor		1.00	1.00	1.00	1.00		0.62	0.32		0.81	0.54	
Incremental Delay, d2		4.7	2.5	17.3	25.1		4.1	1.7		9.8	1.2	
Delay (s)		47.4	33.7	64.8	73.0		31.2	9.3		50.0	16.5	
Level of Service		D	C	E	E		C	A		D	B	
Approach Delay (s)		38.0			69.5			13.6			18.9	
Approach LOS		D			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	140	390	510	310	350	290	1670	680	40	1390	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	6.3	6.3	5.6	6.3	6.3	5.6	6.3	6.3	5.6	6.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	0.88	0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3539	1583	3433	3539	1560	3433	5085	2787	3433	5046	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	3539	1583	3433	3539	1560	3433	5085	2787	3433	5046	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	102	143	398	520	316	357	296	1704	694	41	1418	71
RTOR Reduction (vph)	0	0	164	0	0	169	0	0	194	0	4	0
Lane Group Flow (vph)	102	143	234	520	316	188	296	1704	500	41	1485	0
Confl. Peds. (#/hr)						2			12			
Confl. Bikes (#/hr)												2
Turn Type	Prot	NA	pt+ov	Prot	NA	Perm	Prot	NA	pt+ov	Prot	NA	
Protected Phases	7	4	4 5	3	8		5	2	2 3	1	6	
Permitted Phases						8						
Actuated Green, G (s)	13.5	12.8	25.2	20.4	19.7	19.7	12.4	50.0	76.0	3.0	40.6	
Effective Green, g (s)	13.5	12.8	25.2	20.4	19.7	19.7	12.4	50.0	70.4	3.0	40.6	
Actuated g/C Ratio	0.12	0.12	0.23	0.19	0.18	0.18	0.11	0.45	0.64	0.03	0.37	
Clearance Time (s)	5.6	6.3		5.6	6.3	6.3	5.6	6.3		5.6	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	421	411	362	636	633	279	386	2311	1783	93	1862	
v/s Ratio Prot	0.03	0.04	0.15	c0.15	0.09		0.09	c0.34	0.18	0.01	c0.29	
v/s Ratio Perm						c0.12						
v/c Ratio	0.24	0.35	0.65	0.82	0.50	0.67	0.77	0.74	0.28	0.44	0.80	
Uniform Delay, d1	43.6	44.8	38.4	43.0	40.7	42.1	47.4	24.6	8.7	52.7	31.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.86	1.10	1.62	0.77	0.67	
Incremental Delay, d2	0.3	0.5	3.9	8.0	0.6	6.3	7.9	1.9	0.1	2.7	3.0	
Delay (s)	43.9	45.3	42.3	51.1	41.3	48.4	48.7	28.9	14.2	43.4	23.9	
Level of Service	D	D	D	D	D	D	D	C	B	D	C	
Approach Delay (s)		43.2			47.7			27.3			24.4	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	23.8
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	690	360	0	1950	1970	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		6.3	6.3	
Lane Util. Factor	0.97	1.00		0.86	0.81	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3433	1583		6408	7544	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3433	1583		6408	7544	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	704	367	0	1990	2010	0
RTOR Reduction (vph)	0	2	0	0	0	0
Lane Group Flow (vph)	704	365	0	1990	2010	0
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	31.1	31.1		67.0	67.0	
Effective Green, g (s)	31.1	31.1		67.0	67.0	
Actuated g/C Ratio	0.28	0.28		0.61	0.61	
Clearance Time (s)	5.6	5.6		6.3	6.3	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	970	447		3903	4594	
v/s Ratio Prot	0.21			c0.31	0.27	
v/s Ratio Perm		c0.23				
v/c Ratio	0.73	0.82		0.51	0.44	
Uniform Delay, d1	35.6	36.8		12.2	11.5	
Progression Factor	1.00	1.00		0.40	0.71	
Incremental Delay, d2	2.3	10.4		0.2	0.2	
Delay (s)	37.9	47.2		5.1	8.4	
Level of Service	D	D		A	A	
Approach Delay (s)	41.1			5.1	8.4	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	180	60	30	200	20	520	30	1250	320	840	1410	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6	5.6	5.2	5.3	5.3	5.2	5.3	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.91	1.00	0.97	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1752		1770	1863	1583	1770	5085	1535	3433	5039	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1752		1770	1863	1583	1770	5085	1535	3433	5039	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	184	61	31	204	20	531	31	1276	327	857	1439	82
RTOR Reduction (vph)	0	20	0	0	0	74	0	0	135	0	5	0
Lane Group Flow (vph)	184	72	0	204	20	457	31	1276	192	857	1516	0
Confl. Peds. (#/hr)			7						9			
Confl. Bikes (#/hr)			4						4			1
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8	8 1	5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	15.9	11.5		23.9	19.5	47.5	3.1	24.9	24.9	28.0	49.8	
Effective Green, g (s)	15.9	11.5		23.9	19.5	47.5	3.1	24.9	24.9	28.0	49.8	
Actuated g/C Ratio	0.14	0.10		0.22	0.18	0.43	0.03	0.23	0.23	0.25	0.45	
Clearance Time (s)	5.6	5.6		5.6	5.6		5.2	5.3	5.3	5.2	5.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	2.0	2.0	3.0	2.0	
Lane Grp Cap (vph)	255	183		384	330	683	49	1151	347	873	2281	
v/s Ratio Prot	c0.10	0.04		0.12	0.01	c0.29	0.02	c0.25		c0.25	0.30	
v/s Ratio Perm									0.13			
v/c Ratio	0.72	0.40		0.53	0.06	0.67	0.63	1.11	0.55	0.98	0.66	
Uniform Delay, d1	44.9	46.0		38.1	37.6	25.0	52.9	42.5	37.6	40.7	23.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.82	0.40	
Incremental Delay, d2	9.6	1.4		1.4	0.1	2.5	23.7	61.5	6.3	24.4	1.4	
Delay (s)	54.6	47.4		39.5	37.7	27.4	76.6	104.1	43.9	58.0	10.8	
Level of Service	D	D		D	D	C	E	F	D	E	B	
Approach Delay (s)		52.2			31.0			91.5			27.8	
Approach LOS		D			C			F			C	

Intersection Summary			
HCM 2000 Control Delay	50.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.7
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX C: "WITHOUT RANCHO DEL ORO INTERCHANGE" MEMORANDUM

FEHR PEERS

MEMORANDUM

Date: April 4, 2016

To: Darra Woods, City of Oceanside

From: Christine Mercado, Fehr & Peers
Dawn Wilson, STC Traffic, Inc.

Subject: Alternative Scenario Assessment for the College Boulevard Improvements Project EIR – "Without Rancho Del Oro Interchange" Conditions

SD14-0153

The transportation impact analysis (TIA) for the proposed College Boulevard Improvements Project utilized the SANDAG Series 12 regional traffic model for future year (2035) forecasts. Included in the Series 12 model future year roadway network is the SR-78/Rancho Del Oro interchange, which is also included in the proposed 2030 Master Transportation Roadway Plan presented in the City of Oceanside's *Circulation Element*. Thus, the 2035 study scenarios presented in the College Boulevard Improvements Project TIA reflect the forecast volume with the completion of the SR-78/Rancho Del Oro interchange located southwest of the College Boulevard corridor study area.

At the request of City Council, Fehr & Peers also evaluated intersection and roadway segment operations of the Future (2035) Recommended Alternative without the SR-78/Rancho Del Oro interchange and assessed the change in traffic patterns without the construction of the new interchange and how the anticipated change would affect operations along College Boulevard.

This technical memorandum presents details of the alternative scenario assessment for the "Without Rancho Del Oro Interchange" Conditions, including a description of the methodologies and assumptions used to conduct the analysis and a discussion of the operational analysis results. The tabulated results of the operational analysis along with the all the supporting figures are provided at the conclusion of this technical memorandum.

ASSUMPTIONS & METHODOLGIES

This section describes the roadway network assumptions and model and traffic methodologies used to conduct the alternative scenario analysis for the Future (2035) Conditions with Recommended Alternative and without the Rancho Del Oro Interchange (hereafter referred to as the "Without Rancho Del Oro Interchange" Conditions).

ROADWAY NETWORK ASSUMPTIONS

The Future (2035) Conditions with Recommended Alternative maintains four lanes along College Boulevard from Waring Road and Olive Drive, while the segments along College Boulevard between Vista Way and Waring Road and between Olive Drive and Old Grove Drive are widened and/or classified as a six-lane Major Arterial per the City's *Circulation Element*.

The only difference in the roadway assumptions between the "Without Rancho Del Oro Interchange" scenario presented in this memorandum and the Future (2035) Recommended Alternative is the removal of the Rancho Del Oro Interchange from the 2035 roadway network. Since the future interchange is outside the College Boulevard study corridor that extends from Plaza Drive to the south and Old Grove Road to the north, the geometries for the 13 study intersections and the cross-sections for the eight (8) study roadway segments along College Boulevard are maintained and consistent with the Future (2035) Conditions with Recommended Alternative roadway network assumptions presented in the College Boulevard Improvements Project TIA.

FUTURE FORECAST MODEL METHODOLOGY

Fehr & Peers coordinated with SANDAG staff to run the Series 12 model for the Recommended Alternative Condition (i.e. with the six lanes from Old Grove Road to Olive Drive, four lanes from south of Olive Drive to Waring Road, and six lanes from Waring Road to Vista Way coded into the roadway network), but without the SR-78/Rancho del Oro interchange in the 2035 roadway network.

In addition to the model run, select link model runs were also requested from SANDAG at the following locations:

- College Boulevard between Waring Road and Vista Way
- College Boulevard between Olive Drive and Thunder Road

For each of these links, select link model runs were conducted for both the Future (2035) Condition with Recommended Alternative and the new "Without Rancho Del Oro Interchange" model runs. The select link analysis was then used to determine the traffic patterns in the study area with and without the RDO interchange.

Assessment of Future Forecasts

A review of the select link results showed that the removal of the Rancho Del Oro interchange is expected to have a negligible effect on the distribution of traffic at the locations where the select link analyses were conducted. Maps of the select link runs are attached at the end of this memorandum.

To better understand the changes in traffic patterns, a screenline analysis was conducted to determine the forecasted changes in overall north-south directional traffic parallel to and along College Boulevard. Results of the screenline analysis showed that a total of 99,600 vehicles will cross the southern screenline from Rancho Del Oro to Emerald Drive under Future (2035) Conditions with Recommended Alternative, which is illustrated on **Figure 1**. Removal of the SR-78/Rancho Del Oro interchange is projected to decrease daily traffic across the southern screenline by a total of 10,800 vehicles (to 88,800 vehicles). The results of the northern screenline evaluation (shown on **Figure 1)** from Rancho Del Oro to Emerald Drive fails to show a significant change in ADT with the removal of the interchange, as the delta between the two scenarios is approximately 2,200 ADT. Overall, the removal of the SR-78 interchange at Rancho Del Oro has the greatest effects on traffic along segments closer to the SR-78 interchange at College Boulevard, and has minimal effects on traffic along segments located in the northern section of the College Boulevard study area.

The change in traffic patterns between the Recommended Alternative with and without the SR-78/Rancho Del Oro interchange in place are further illustrated using the daily volumes forecast in the respective model runs. **Figure 2** illustrates the percent change in ADT along all the roadway links from the Recommended Alternative Conditions to the "Without Rancho Del Oro Interchange" Conditions. Alternatively, **Figure 3** illustrates the percent change in ADT along all the roadway links from the "Without Rancho Del Oro Interchange" Conditions to the Recommended Alternative Conditions. These figures illustrate how the construction of the interchange at Rancho

Del Oro would change traffic volumes along portions of nearby north-south corridors, such as El Camino Real, College Boulevard, Thunder Drive, and Emerald Drive.

The results of this analysis show that the removal of the Rancho Del Oro interchange results in a decrease in ADT along College Boulevard between Waring Road and Thunder Drive **(Figure 2).** This may be caused by the increased latent demand congestion occurring along College Boulevard segments near and at the SR-78/College Boulevard interchange under the "Without Rancho Del Oro Interchange" Conditions. Due to this bottleneck at the southern portion of the College Boulevard study corridor, drivers avoid using the roadway to access their destinations. Instead, drivers are projected to use other parallel facilities with capacity, such as Emerald Drive and Thunder Drive. These shifts in traffic are not concentrated along one particular street, and so traffic operations along streets with the re-routed volume from College Boulevard are not expected to be negatively affected. When the Rancho Del Oro interchange is in place, the shifted volumes revert back to College Boulevard, and the SR-78/College Boulevard interchange becomes less congested as depicted on **Figure 3.**

It should also be noted that during the model review process and consultation with City of Oceanside staff, roadway segment volume adjustments were made to the "Without Rancho Del Oro Interchange" Conditions. Without the RDO interchange, the model results showed that traffic would be re-routed to Emerald Drive and then access College Boulevard by turning onto Galbar Street and then Thunder Drive to access College Boulevard. A portion of the volumes forecast to use this alternative route were manually shifted to Emerald Drive then Olive Drive to access College Boulevard, which more accurately reflects existing driver behavior.

Once the volumes from the model were refined, Fehr & Peers applied the difference method to calculate the ADT volumes for the study roadway segments. The difference method calculates the difference in ADT volume from the 2008 SANDAG calibration model to the 2035 forecast model and adds the difference to the existing 2014 ground counts collected for this project. The volumes are then rounded to the nearest hundred, and the resulting volumes are shown on **Figure 4**

The post-processed ADT volumes were then used to forecast peak hour intersection volumes. The intersection volumes were calculated based on existing turning movements at the study intersections as reported in the peak hour turning movement counts collected for this project. The growth in traffic through the intersection is based on changes in daily traffic volumes, changes in traffic patterns identified in the traffic model, and engineering judgment. Post-

processed peak hour volumes used in the technical analysis were rounded to the nearest ten, and the final volumes are shown on **Figure 5**.

TRAFFIC ANALYSIS METHODS

Traffic analysis was conducted in accordance with the guidelines and standards presented in the *Oceanside General Plan: Circulation Element*. The analysis of roadway operations performed for this study is based on procedures presented in the *Highway Capacity Manual* (HCM), published by the Transportation Research Board in 2000. Overall, the traffic analysis methodologies used in for this alternative scenario assessment are consistent with methods used in the TIA.

OPERATIONAL ANALYSIS RESULTS

Intersection operating conditions, daily roadway segment operations and peak hour segment operating conditions were evaluated for the same study locations identified in the TIA (i.e. 13 study intersections and 8 roadway segments) under the "Without Rancho Del Oro Interchange" Conditions. The results of the analysis are reported in **Tables 1 through 4** and the corresponding output worksheets are attached to this report. The following section summarizes the results of the analysis.

INTERSECTION OPERATIONS

Based on the intersection operations analysis, the following study intersections are operating at deficient levels of service (LOS E or LOS F) in either the AM and/or PM peak hour under the "Without Rancho Del Oro Interchange" Conditions:

- Intersection 11: College Boulevard/Vista Way (LOS E – AM and PM peak hours)
- Intersection 13: College Boulevard/Haymar Drive/Plaza Drive (LOS E – PM peak hour)

The results of the "Without Rancho Del Oro Interchange" Conditions are presented in **Table 1**. For comparison purposes, the intersection LOS results for the Future (2035) Conditions with Recommended Alternative reported in the TIA were also included in the table.

DAILY ROADWAY SEGMENT OPERATIONS

Based on the daily roadway segment operations analysis, the following study segments are operating at deficient levels of service (LOS E or LOS F) under the "Without Rancho Del Oro Interchange" Conditions:

- Segment 3: College Boulevard between Aztec Street & Oceanside Boulevard (LOS E)
- Segment 4: College Boulevard between Oceanside Boulevard & Olive Drive (LOS F)
- Segment 5: College Boulevard between Olive Drive & Thunder Drive (LOS E)
- Segment 8: College Boulevard between Barnard Drive/Waring Road & Vista Way (LOS E)

Table 2 displays the analysis for the key corridor study area roadway segments under the "Without Rancho Del Oro Interchange" Conditions. For comparison purposes, the daily roadway segment LOS results for the Future (2035) Conditions with Recommended Alternative reported in the TIA were also included in the table.

PEAK HOUR SEGMENT ANALYSIS

Under the "Without Rancho Del Oro Interchange" Conditions, a peak hour roadway segment analysis was also conducted for the corridor study area to further understand the operational characteristics along the corridor during peak conditions. The peak hour analysis was conducted using the HCM Arterial Analysis methodology and helps better gauge the operational benefits associated with intersection improvements and spot widening along the corridor that cannot be reflected in the daily segment analysis, which uses volume-over-capacity ratios.

Table 3 presents results of the peak hour segment analysis for this scenario. As depicted in the table, the following roadway segments are found to operate at deficient levels of service (LOS E or LOS F) during one or more peak hours in at least one direction of travel:

- College Boulevard between Aztec Street and Oceanside Boulevard (LOS F in the AM peak hour in the southbound (SB) direction during the AM peak hour; LOS E in the northbound (NB) direction during the PM peak hour)
- College Boulevard between Oceanside Boulevard and At-Grade Crossing (LOS F in both the NB and SB directions during the AM and PM peak hours)
- College Boulevard between Vista Way and SR-78 Eastbound Off-Ramps (LOS F in both the SB direction during the AM and PM peak hours)

- College Boulevard between SR-78 Eastbound Off-Ramp and Plaza Drive (LOS E in both the NB and SB directions during the AM peak hour; LOS E in the NB direction in the PM during the PM peak hour; LOS F in the SB direction during the PM peak hour)

VEHICLE MILES TRAVELED ASSESSMENT

Vehicle miles traveled (VMT) is a measure of the distance that people will travel in a light duty truck or passenger automobile. The VMT for the "Without Rancho Del Oro Interchange" Conditions was calculated using the same methodology used in the TIA, where the number of daily trips were multiplied by the trip length obtained from the SANDAG Series 12 traffic model run.

The resulting VMT for this assessment are very high-level in that they represent the model-wide VMT (i.e. the link length multiplied by the corresponding ADT traversing the link for all links in the SANDAG model). The 2035 daily VMT for the entire SANDAG model is 102,613,732 under the "Without Rancho Del Oro Interchange" Conditions and 102,604,488 miles under the Recommended Alternative. The higher cumulative VMT figure is due to a higher average trip length, which reflects changes in travel behavior patterns with the exclusion of the interchange. Although the comparison in VMT figure between the two alternatives show an increase in the travel distance for drivers under the "Without Rancho Del Oro Interchange" Conditions, the percentage increase is negligible (i.e. less than a 0.01% increase) further indicating that the net effect of the SR-78/College Boulevard interchange on regional VMT is not significant.

LEFT-TURN QUEUE ASSESSMENT

Below are the study intersections that were also analyzed for any excessive queueing under the "Without Rancho Del Oro Interchange" Conditions using the queueing reports provided by the Synchro 8 analysis software:

1. College Boulevard/Old Grove Road
2. College Boulevard/Avenida De La Plata
3. College Boulevard/Aztec Street
4. College Boulevard/Oceanside Boulevard
5. College Boulevard/Olive Drive

The purpose of this evaluation is to determine the frequencies of left-turn traffic spilling back into the through traffic lanes thereby reducing through capacity along College Boulevard during the

peak hours. Based on the Synchro queue reports, potential queuing issues have been identified at:

- Northbound (NBL) on College Boulevard/Old Grove Road in the AM and PM peak hour
- NBL on College Boulevard/Avenida De La Plata during the AM peak hour
- NBL on College Boulevard/Oceanside Boulevard during the AM peak hour
- Southbound (SBL) on College Boulevard/Old Grove Road in the PM peak hour
- SBL on College Boulevard/Oceanside Boulevard during the PM peak hour
- SBL on College Boulevard/Olive Drive during the PM peak hour

The above queuing issues, which are also shown in **Table 4**, are based on a review of the 95th percentile queues. The 95th percentile queues represent the worst-case conditions that in many cases will not be experienced due to upstream metering. A review of also the 50th percentile queues, which reflect more typical cycle conditions, showed that there will be no regularly occurring left-turn queuing issues at College Boulevard/Old Grove Road, College Boulevard/Avenida De La Plata, and College Boulevard/Oceanside Boulevard. At College Boulevard/Olive Drive, the Future Year 2035 PM peak hour volume on the southbound approach will exceed the capacity, and so the southbound left turn may experience queues that are longer than reported under the 50th percentile analysis. The vehicle delay experienced through this section is primarily attributed to the heavy southbound left turn volumes at this location and the Sprinter commuter rail crossing between Oceanside Boulevard and Olive Drive.

ALTERNATIVE SCENARIO FINDINGS

Under the "Without Rancho Del Oro Interchange" Conditions, all intersections are projected to operate within the City of Oceanside's acceptable level of service threshold of LOS D during both the AM and PM peak hours, with the exception of the following locations:

- Intersection 11: College Boulevard/Vista Way (LOS E during the AM and PM peak hours)
- Intersection 13: College Boulevard/Haymar Drive/Plaza Drive (LOS E during the PM peak hour)

It should be noted that the above locations were found to operate acceptably under the Recommended Alternative. Thus, the deficient intersection operating conditions identified above

reflect the increase in traffic at intersections adjacent to the SR-78/College Boulevard Interchange under the "Without Rancho Del Oro Interchange" Conditions.

The results of the intersection operating analysis continues to show that maintaining the four-lane cross-section along College Boulevard between Olive Drive and Waring Road would still be able to serve the 2035 traffic volumes forecasted at each study intersection without the Rancho Del Oro interchange. Additionally, a comparison of the average vehicle delay experienced at each intersection under the Future Conditions with Recommended Alternative and "Without Rancho Del Oro Interchange" Conditions shows very minimal change at study intersections north of Vista Way and that the primary differences in vehicle delay are concentrated at intersections in proximity to the SR-78 interchange at College Boulevard.

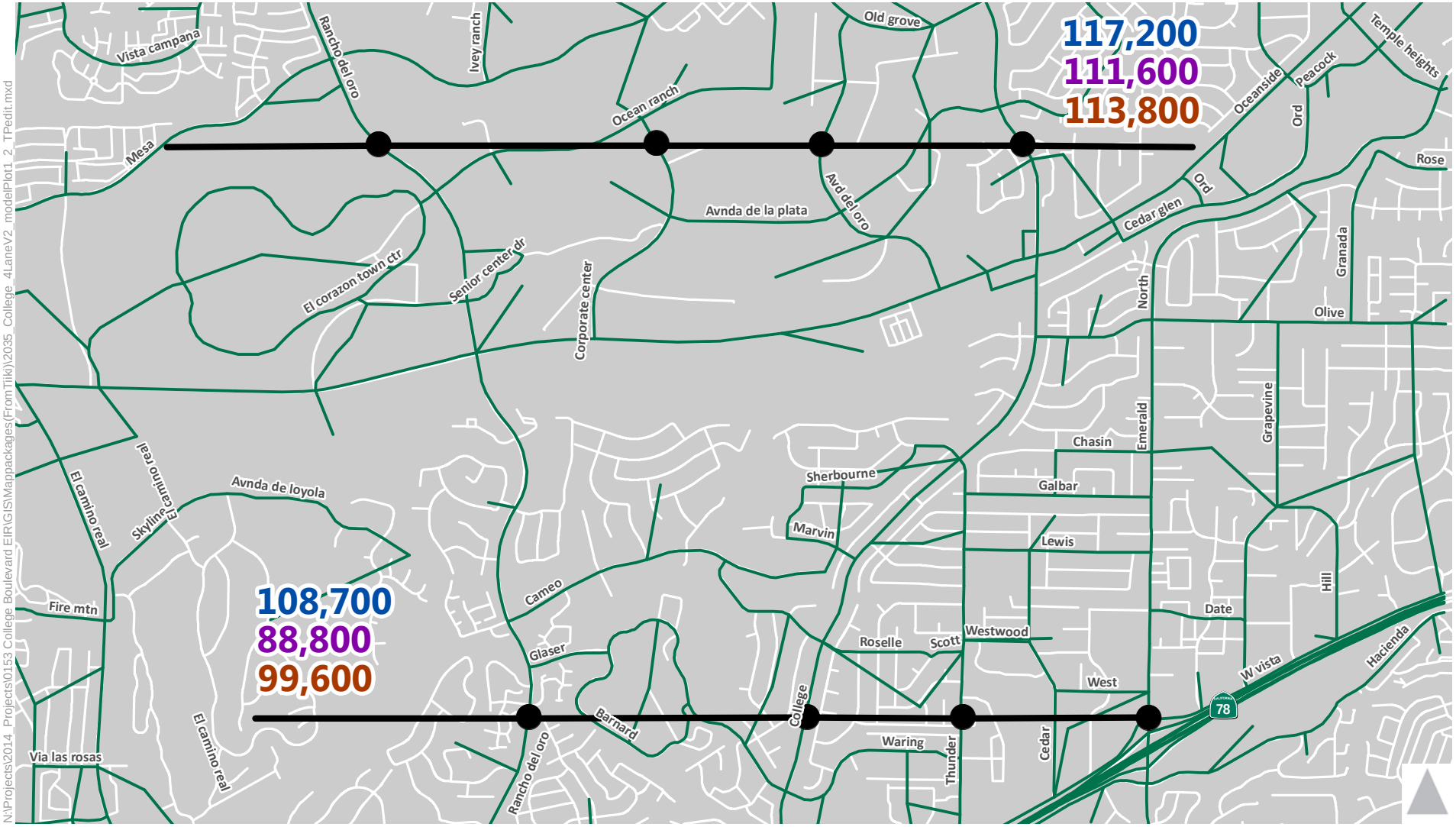
Without the interchange, the daily roadway segment operations analysis showed that four of the eight study segments along the corridor would operate at LOS E or LOS F based on the daily segment (V/C) method. These roadway segments were also found to operate poorly under the Recommended Alternative.

Daily roadway segment volumes and capacity provide a very generic analysis of the roadway operating conditions. On urban arterials, where the traffic signals along the corridor control the flow of traffic, the intersections and peak hour roadway segment analysis provide a more accurate assessment of the traffic conditions on a roadway segment. The peak hour HCM roadway segment analysis determined that all segments between Olive Drive and Waring Road are projected to operate at LOS D or better in both the northbound and southbound directions during the AM and PM peak hour under the "Without Rancho Del Oro Interchange" Conditions. However, peak hour deficient operations have been identified at segments on either side of the Sprinter Rail Crossing due to the disruption in traffic that occurs during gate actuation, as well as at the segments located near and adjacent to the SR-78/College Boulevard interchange.

Overall, the findings of this alternative scenario analysis show that the traffic shifts with the removal of the SR-78/Rancho Del Oro interchange would still support maintaining a four-lane section of College Boulevard between Olive Drive and Waring Road in 2035 at both the intersection and roadway segment level during peak hour conditions. Removal of the nearby interchange would also cause increased traffic congestion at the SR-78/College Boulevard interchange, which causes deficient intersection and roadway operations at the southern section of the College Boulevard study corridor.

ATTACHMENTS

FIGURES



ADT Used for Screenline

Screenline

Model Network

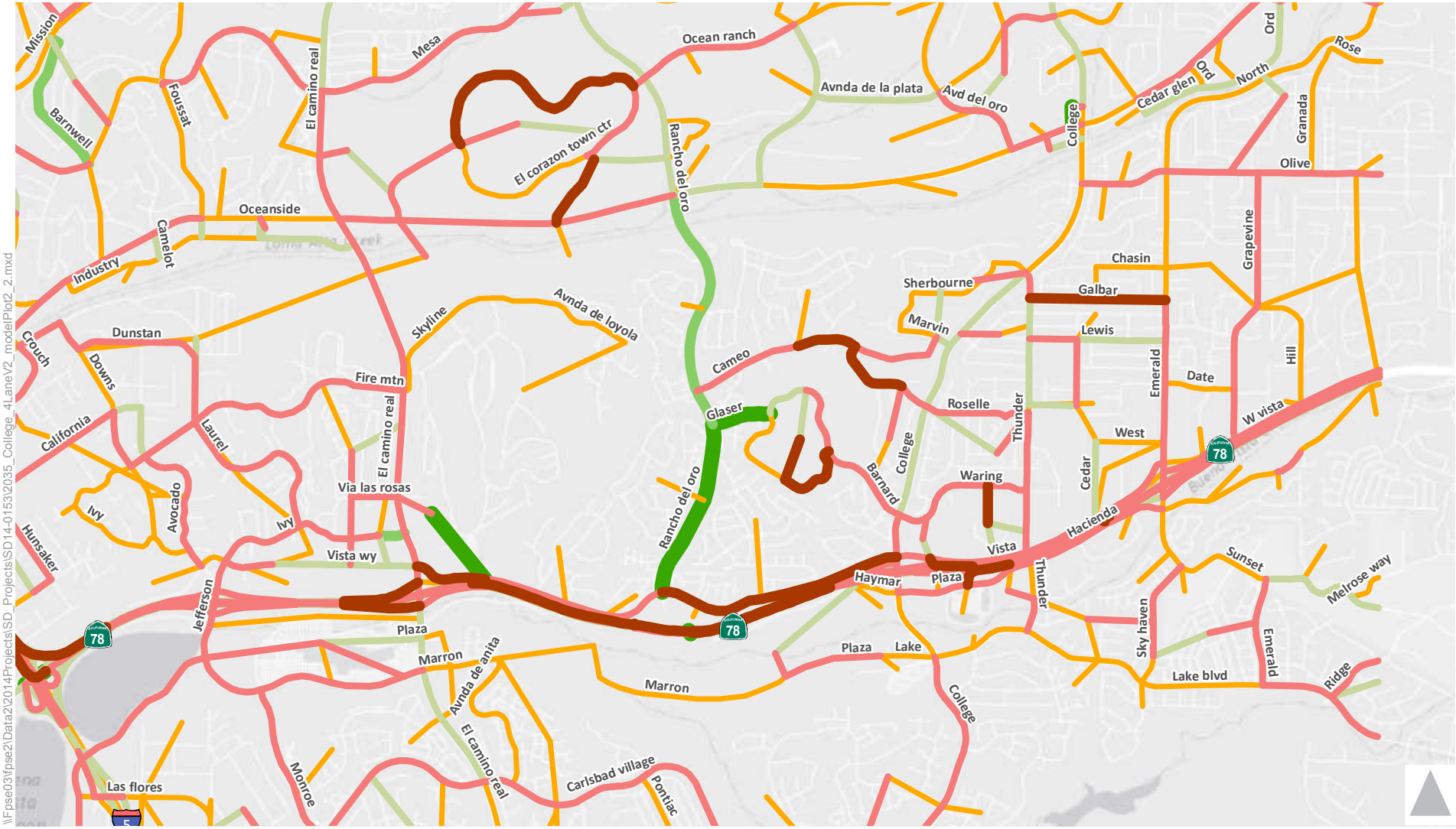
Total ADT Intersecting Screenline Under Circulation Element Alternative

Total ADT Intersecting Screenline Under "Without Rancho Del Oro Interchange" Conditions

Total ADT Intersecting Screenline Under Recomended Alternative

Figure 1

Model Screen Lines-
Future (2035) Conditions



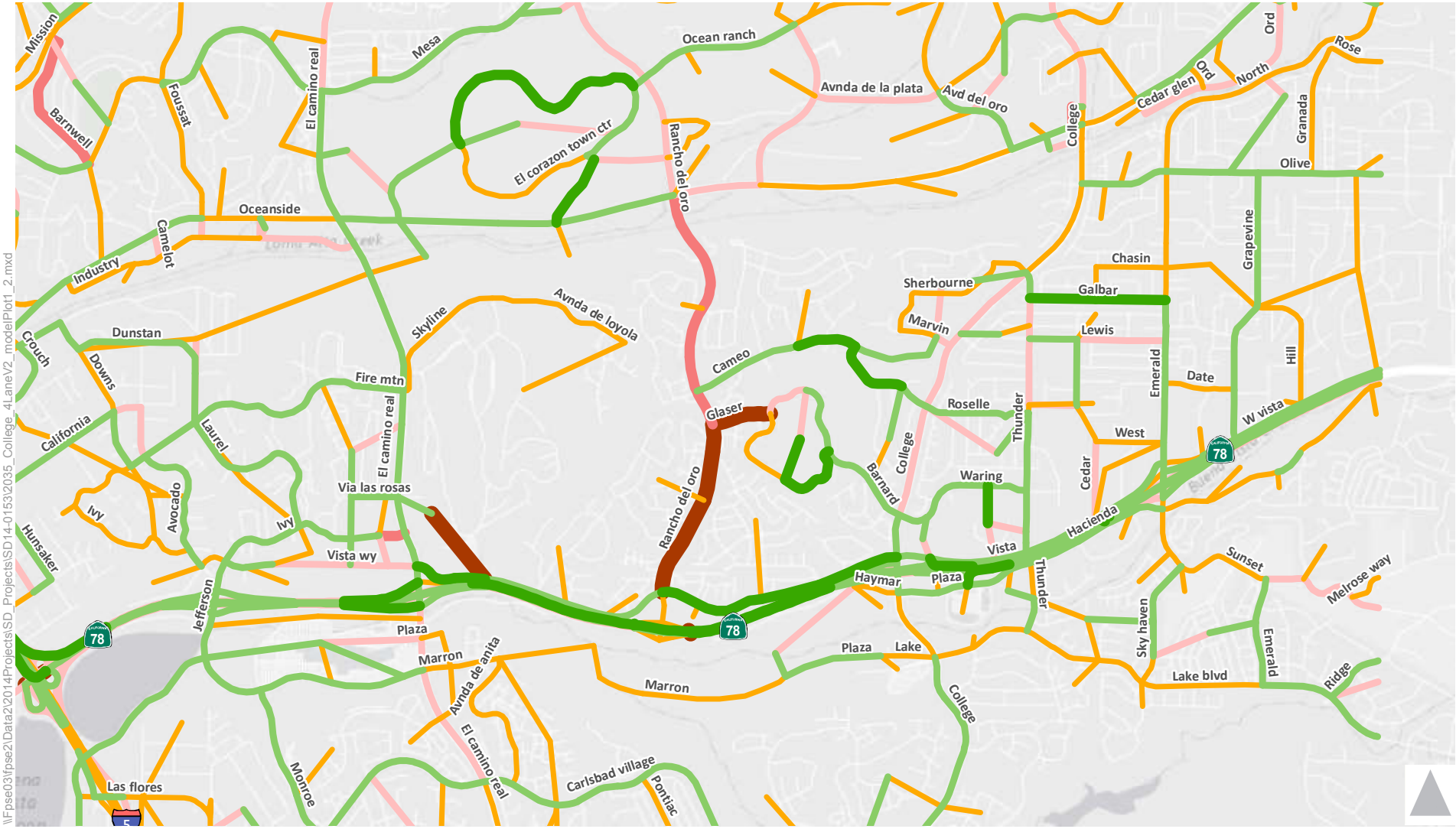
\\Fpse03\fpse2\Data2\2014Projects\SD_Projects\SD14-01532035_College_4LaneV2_modelPlot2_2.mxd

Percent (%) Change

-145% to -38%	-1% to 1%
-38% to -15%	1% to 15%
-15% to -1%	15% to 36%

Figure 2

Percent Change in ADT from with RDO Interchange to without RDO Interchange - Future (2035) Conditions with Recommended Alternative



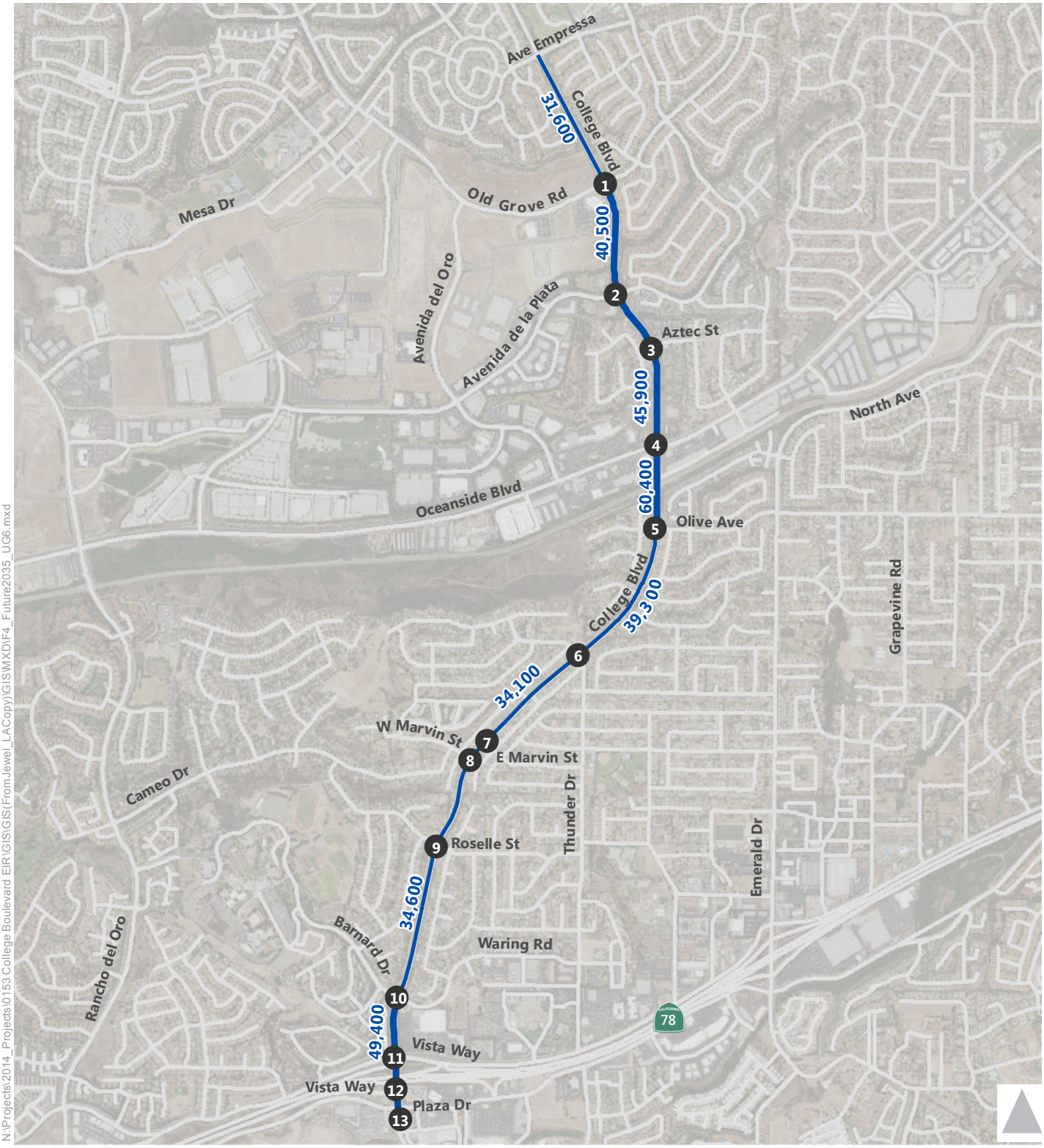
\\Fpse03\fpse2\Data2\2014Projects\SD_Projects\SD14-01532035_College_4LaneV2_modelPlot1_2.mxd

Percent (%) Change

-36% to -15%	1% to 15%
-15% to -1%	15% to 38%
-1% to 1%	38% to 145%

Figure 3

Percent Change in ADT from without RDO Interchange to with RDO Interchange - Future (2035) Conditions with Recommended Alternative



Study Intersections

4-Lane Major Arterial with Raised Median

6-Lane Major Arterial, Divided

Figure 4

Future (2035) Average Daily Traffic (ADT) Volumes "Without Rancho Del Oro Interchange" Conditions

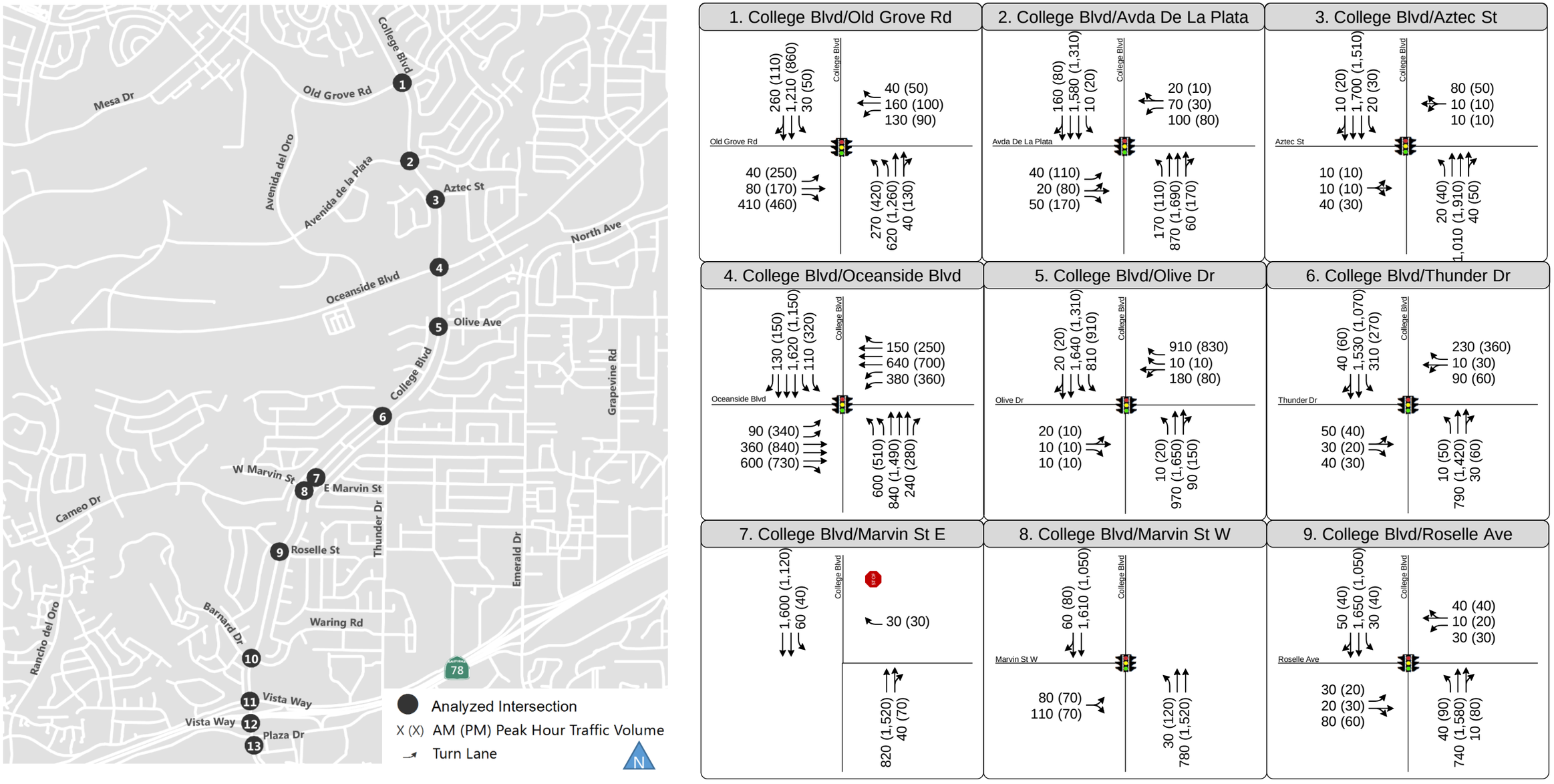


Figure 5

Peak Hour Traffic Volumes and Lane Configurations "Without Rancho Del Oro Interchange" Conditions

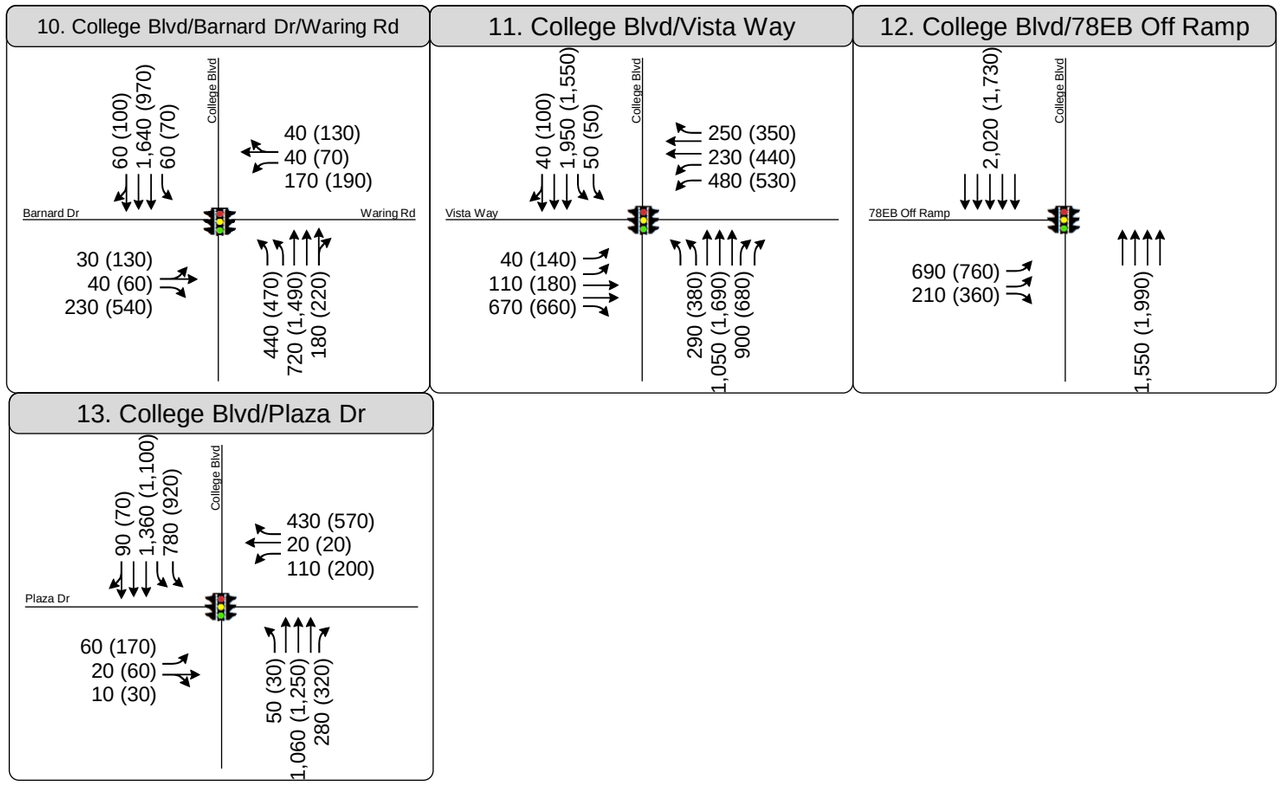


Figure 5

Peak Hour Traffic Volumes and Lane Configurations Without Rancho Del Oro Interchange" Conditions

TABLES

TABLE 1: INTERSECTION LEVEL OF SERVICE SUMMARY

Intersection	Traffic Control	Peak Hour	Future (2035) Conditions with Recommended Alternative		"Without Rancho Del Oro Interchange" Conditions		
			Delay (sec/veh)[1]	LOS[2,3]	Delay (sec/veh)[1]	LOS[2,3]	Delay Change[1]
1. College Boulevard/Old Grove Road	Signalized	AM	36.2	D	36.6	D	0.4
		PM	31.1	C	31.4	C	0.3
2. College Boulevard/Avenida De La Plata	Signalized	AM	17.7	B	18.4	B	0.7
		PM	15.6	B	15.6	B	0
3. College Boulevard/Aztec Street	SSSC (Existing) Signal (Future)	AM	5.2	A	5.2	A	0
		PM	5.1	A	5.0	A	-0.1
4. College Boulevard/Oceanside Boulevard	Signalized	AM	51.2	D	54.2	D	3
		PM	50.3	D	53.3	D	3
5. College Boulevard/Olive Drive	Signalized	AM	27.6	C	27.8	C	0.2
		PM	48.6	D	50.0	D	1.4
6. College Boulevard/Thunder Drive	Signalized	AM	19.3	B	20.1	C	0.8
		PM	25.4	C	26.1	C	0.7
7. College Boulevard/Marvin Street East	SSSC	AM	10.3	B	10.5	B	0.2
		PM	14.1	B	14.4	B	0.3
8. College Boulevard/Marvin Street West	Signalized	AM	13.6	B	12.1	B	-1.5
		PM	11.4	B	9.9	A	-1.5
9. College Boulevard/Roselle Avenue	Signalized	AM	7.3	A	7.1	A	-0.2
		PM	8.9	A	8.9	A	0
10. College Boulevard/Barnard Drive/Waring Road	Signalized	AM	23.2	C	28.6	C	5.4
		PM	23.2	C	25.9	C	2.7
11. College Boulevard/Vista Way	Signalized	AM	27.2	C	**80.0**	**E**	52.8
		PM	32.3	C	**57.3**	**E**	25
12. College Boulevard/SR-78 Eastbound Off-Ramps	Signalized	AM	11.7	B	11.7	B	0
		PM	14.0	B	15.0	B	1
13. College Boulevard/Haymar Drive/Plaza Drive	Signalized	AM	22.1	C	24.6	C	2.5
		PM	50.3	D	**63.0**	**E**	12.7

Source: Fehr & Peers, 2016.

Notes:

SSSC = Side street stop-controlled intersection

[1] Whole intersection weighted average stopped delay expressed in seconds per vehicle for signalized and all-way stop control intersections. The vehicular delay for the worst movement is reported for side street stop-controlled intersections. Additionally, the delay change is difference between the scenario's delay and the Existing Condition's delay.

[2] LOS calculations performed using the *2000 Highway Capacity Manual (HCM)* method.

[3] Unacceptable seconds of delay per vehicle and LOS highlighted in **bold.**

TABLE 2: DAILY ROADWAY SEGMENT LEVEL OF SERVICE SUMMARY

College Boulevard Roadway Segment	Future Cross-Section	Future LOS E Capacity	Future (2035) Conditions with Recommended Alternative			"Without Rancho Del Oro Interchange" Conditions		
			ADT	V/C	LOS	ADT	V/C	LOS
1. Between Avenida Empressa & Old Grove Road	4-Lane Major Arterial w/ raised median	40,000	40,000	32,200	0.805	D	31,600	0.790
2. Between Old Grove Road & Avenida De La Plata	6-Lane Major Arterial, Divided	50,000	40,000	41,100	0.822	D	40,500	0.810
3. Between Aztec Street & Oceanside Boulevard	6-Lane Major Arterial, Divided	50,000	40,000	**46,400**	**0.928**	**E**	**45,900**	**0.918**
4. Between Oceanside Boulevard & Olive Drive	6-Lane Major Arterial, Divided	50,000	40,000	**60,100**	**1.202**	**F**	**60,400**	**1.208**
5. Between Olive Drive & Thunder Drive	4-Lane Major Arterial w/ raised median	40,000	40,000	**39,400**	**0.985**	**E**	**39,300**	**0.983**
6. Between Thunder Drive & Marvin Street East	4-Lane Major Arterial w/ raised median	40,000	40,000	34,500	0.863	D	34,100	0.853
7. Between Roselle Street & Barnard Drive/Waring Road	4-Lane Major Arterial w/ raised median	40,000	40,000	**35,200**	**0.880**	**E**	34,600	0.865
8. Between Barnard Drive/Waring Road & Vista Way	6-Lane Major Arterial, Divided	50,000	50,000	**45,100**	**0.902**	**E**	**49,400**	**0.988**

Source: Fehr & Peers, 2016.

Notes:

[1]Deficient roadway segment operations highlighted in **bold.**

[2] Under this scenario, the 4-Lane Major Arterial cross-section for the segment remains. Therefore, the V/C ratio and future roadway LOS is based on the City's LOS standard and capacity criteria for a 4-Lane Major Arterial roadway.

TABLE 3: PEAK HOUR SEGMENT ANALYSIS FOR "WITHOUT RANCHO DEL ORO INTERCHANGE" CONDITIONS

Roadway Segment	Direction	"Without Rancho Del Oro Interchange" Conditions			
		AM Peak Hour		PM Peak Hour	
		Speed (mph)	LOS	Speed (mph)	LOS
College Boulevard between Old Grove Road and Avenida De La Plata	NB	26.9	C	27.7	C
	SB	24.3	C	23.0	C
College Boulevard between Avenida De La Plata and Aztec Street	NB	27.3	C	29.3	B
	SB	31.4	B	29.7	B
College Boulevard between Aztec Street and Oceanside Boulevard	NB	27.8	C	30.9	B
	SB	**12.0**	**F**	**13.6**	**E**
College Boulevard between Oceanside Boulevard and At-Grade Railroad Crossing	NB	**7.7**	**F**	**4.1**	**F**
	SB	**9.5**	**F**	**10.2**	**F**
College Boulevard between At-Grade Railroad Crossing and Olive Drive	NB	19.2	D	17.3	D
	SB	19.3	D	22.6	C
College Boulevard between Olive Drive and Thunder Drive	NB	19.1	D	17.2	D
	SB	31.3	B	31.0	B
College Boulevard between Thunder Drive and Marvin Street East	NB	25.1	C	23.6	C
	SB	28.4	B	26.8	C
College Boulevard between Marvin Street West and Roselle Avenue	NB	30	B	33.0	B
	SB	29.4	B	31.6	B
College Boulevard between Roselle Avenue and Waring Road	NB	39.7	A	34.2	B
	SB	27.7	C	25.9	C
College Boulevard between Waring Road and Vista Way	NB	24.1	D	18.8	D
	SB	**5.0**	**F**	**8.9**	**F**
College Boulevard between Vista Way and SR-78 Eastbound Off-Ramps	NB	**12.9**	**F**	**8.5**	**F**
	SB	21.1	C	18.0	D
College Boulevard between SR-78 Eastbound Off-Ramp and Plaza Drive	NB	**16.3**	**E**	**14.2**	**E**
	SB	**14.2**	**E**	**9.5**	**F**

Source: Fehr & Peers, 2015.

Notes:

[1]Deficient roadway segment operations highlighted in **bold**.

TABLE 4: "WITHOUT RANCHO DEL ORO INTERCHANGE" CONDITIONS QUEUING ANALYSIS

Intersection	Left-Turn Direction	Double Left	Available Storage (ft)[1]	AM Peak Hour		PM Peak Hour	
				50th %ile (ft)	95th %ile (ft)	50th %ile (ft)	95th %ile (ft)
1. College Boulevard/ Old Grove Road	NB	Yes	350	100	#118	169	#223
	SB	No	310	21	53	42	#100
2. College Boulevard/ Avenida De La Plata	NB	No	360	122	#244	100	166
	SB	No	200	0	*0	18	*24
3. College Boulevard/ Aztec Street	NB	No	180	14	40	37	*39
	SB	No	200	13	*20	23	*51
4. College Boulevard/ Oceanside Boulevard	NB	Yes	320	296	#451	217	281
	SB	Yes	420	54	96	130	#224
5. College Boulevard/ Olive Drive	NB	No	190	7	26	16	45
	SB	Yes	450	268	#370	~488	#619

Notes:

~ = 50th percentile volume exceeds capacity, queue may be longer

= 95th percentile volume exceeds capacity, queue may be longer

* = Volume for 95th percentile queue is metered by upstream signal

[1] Approximate length based on the approved plans for the Recommended Alternative.

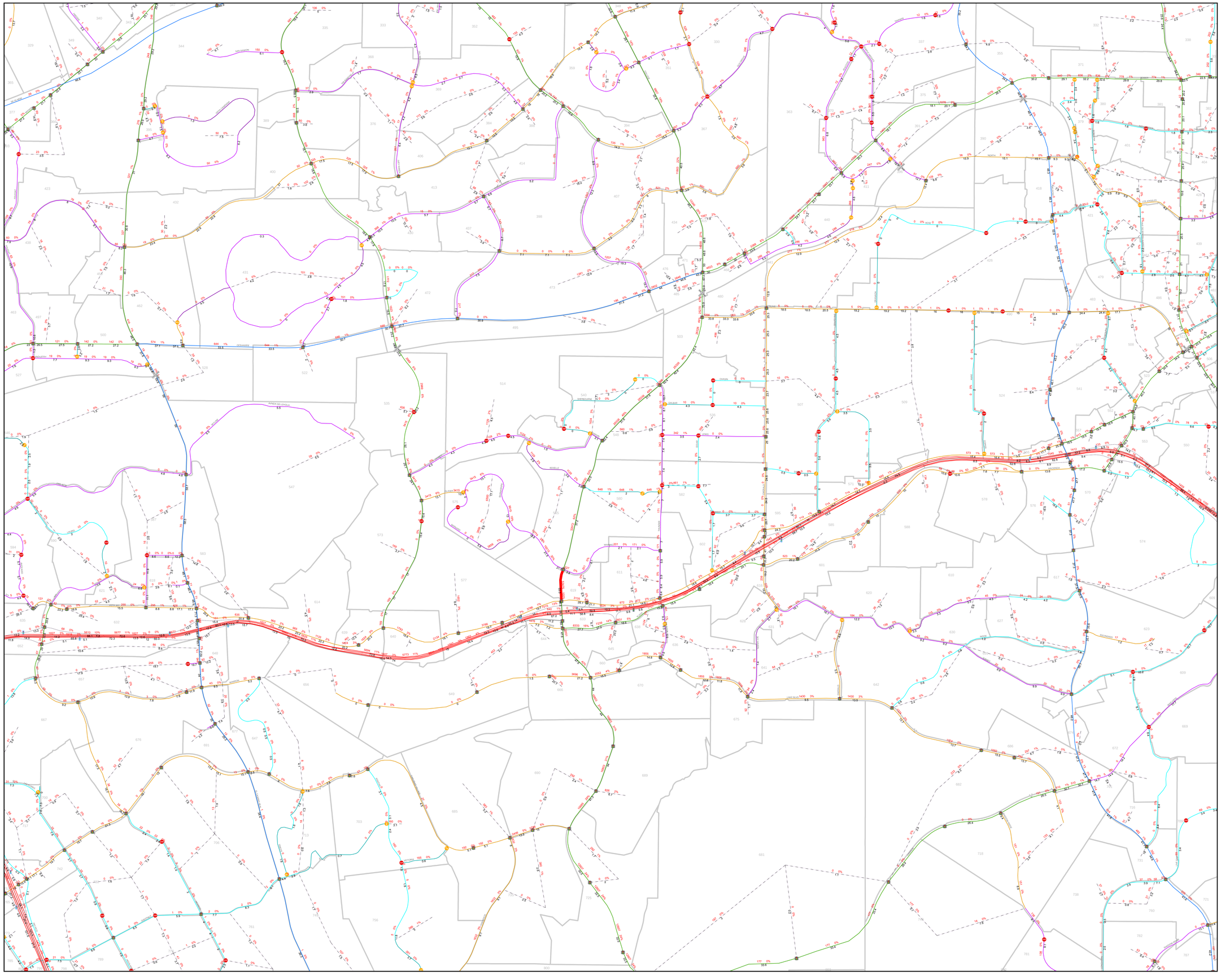
SELECT LINK MAPS

SANDAG
Series 12

2035rc11

Without RDO
Interchange

Select Link Plot



Functional Classifications

- Freeway
- Prime
- Major
- Collector
- Light Collector
- Rural Collector
- Local
- Freeway Ramp
- Local Ramp
- Zone Connector

Traffic Analysis Zones

\# Select Link Volume Percentage

Portions of this map contain information from the San Diego Association of Governments (SANDAG) Regional Information System. This product cannot be reproduced without the written permission of SANDAG.

SAN DIEGO ASSOCIATION OF GOVERNMENTS
401 B STREET, SUITE 800
SAN DIEGO, CALIFORNIA 92101 USA
(619) 699-1900
E-mail: sandag@sandag.org
Web site: www.sandag.org

N

0 0.3 0.6 0.9
Miles

SANDAG

servicebureau

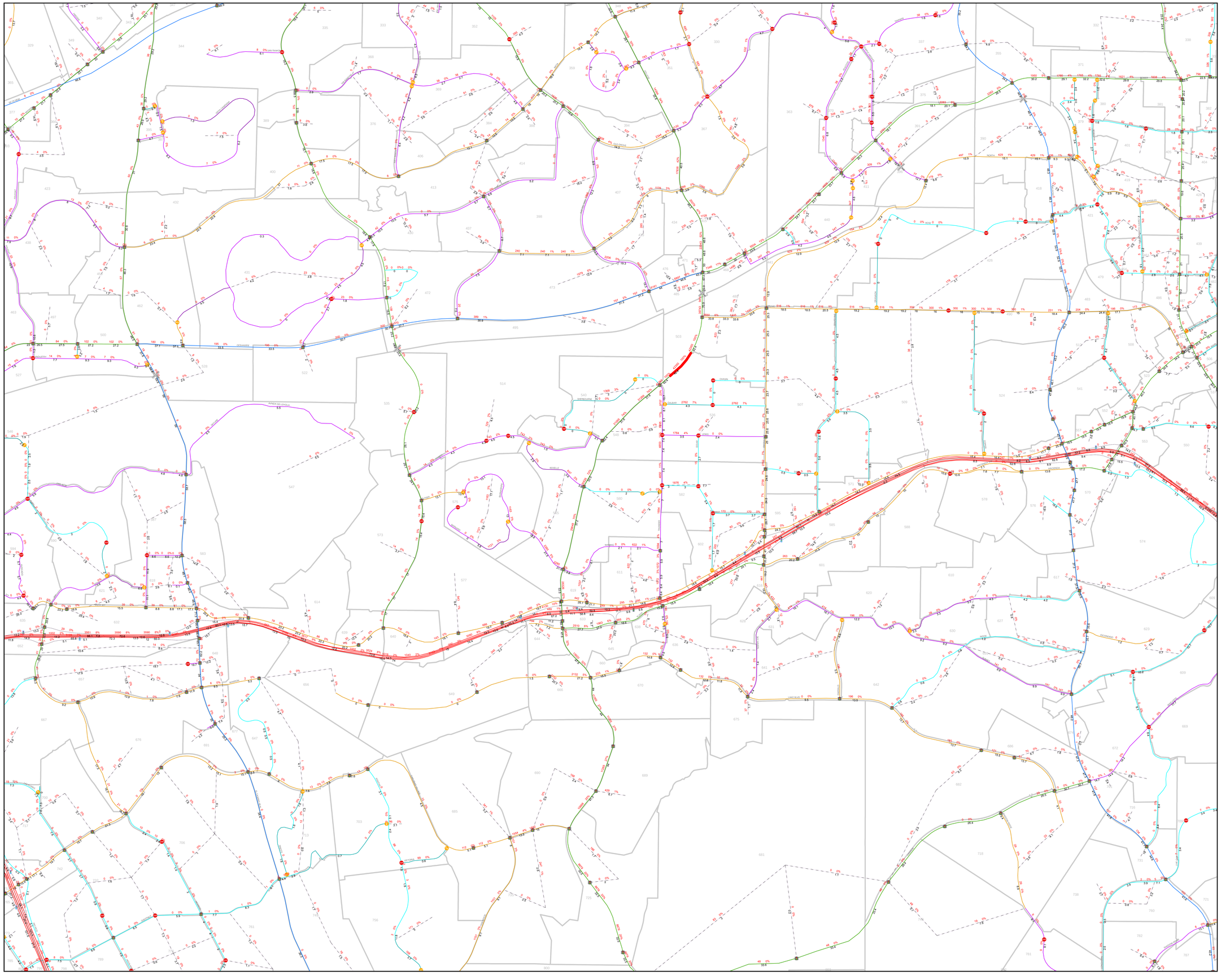
Date: October 23, 2015

SANDAG
Series 12

2035rc11

Without RDO
Interchange

Select Link Plot



Functional Classifications

- Freeway
- Prime
- Major
- Collector
- Light Collector
- Rural Collector
- Local
- Freeway Ramp
- Local Ramp
- Zone Connector

Traffic Analysis Zones

\# Select Link Volume Percentage

Portions of this map contain information from the San Diego Association of Governments (SANDAG) Regional Information System. This product cannot be reproduced without the written permission of SANDAG.

SAN DIEGO ASSOCIATION OF GOVERNMENTS
401 B STREET, SUITE 800
SAN DIEGO, CALIFORNIA 92101 USA
(619) 699-1900
E-mail: sandag@sandag.org
Web site: www.sandag.org

N

0 0.3 0.6 0.9
Miles

SANDAG

servicebureau

Date: October 23, 2015

SANDAG
Series 12

2035rc11

With RDO
Interchange

Select Link Plot

Functional Classifications

- Freeway
- Prime
- Major
- Collector
- Light Collector
- Rural Collector
- Local
- Freeway Ramp
- Local Ramp
- Zone Connector

Traffic Analysis Zones

\# Select Link Volume Percentage

Portions of this map contain information from the San Diego Association of Governments (SANDAG) Regional Information System. This product cannot be reproduced without the written permission of SANDAG.

SAN DIEGO ASSOCIATION OF GOVERNMENTS
401 B STREET, SUITE 800
SAN DIEGO, CALIFORNIA 92101 USA
(619) 699-1900
E-mail: sandag@sandag.org
Web site: www.sandag.org

N

0 0.3 0.6 0.9
Miles

SANDAG

servicebureau

Date: October 20, 2015

SANDAG
Series 12

2035rc11

With RDO
Interchange

Select Link Plot

Functional Classifications

- Freeway
- Prime
- Major
- Collector
- Light Collector
- Rural Collector
- Local
- Freeway Ramp
- Local Ramp
- Zone Connector

Traffic Analysis Zones

\# Select Link Volume Percentage

Portions of this map contain information from the San Diego Association of Governments (SANDAG) Regional Information System. This product cannot be reproduced without the written permission of SANDAG.

SAN DIEGO ASSOCIATION OF GOVERNMENTS
401 B STREET, SUITE 800
SAN DIEGO, CALIFORNIA 92101 USA
(619) 699-1900
E-mail: sandag@sandag.org
Web site: www.sandag.org

N

0 0.3 0.6 0.9
Miles

SANDAG

servicebureau

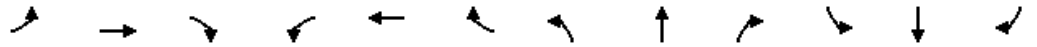
Date: October 20, 2015

LOS WORKSHEETS

“WITHOUT RANCHO DEL ORO INTERCHANGE” CONDITIONS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	80	410	130	160	40	270	620	40	30	1210	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7		4.6	5.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1567	1770	1863	1552	3433	3507		1770	3436	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1567	1770	1863	1552	3433	3507		1770	3436	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	41	82	418	133	163	41	276	633	41	31	1235	265
RTOR Reduction (vph)	0	0	95	0	0	34	0	3	0	0	15	0
Lane Group Flow (vph)	41	82	323	133	163	7	276	671	0	31	1485	0
Confl. Peds. (#/hr)			6			3						2
Confl. Bikes (#/hr)						2						1
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	4.1	12.2	26.1	9.4	17.5	17.5	13.9	64.0		4.2	53.2	
Effective Green, g (s)	4.1	12.2	26.1	9.4	17.5	17.5	13.9	64.0		4.2	53.2	
Actuated g/C Ratio	0.04	0.11	0.24	0.09	0.16	0.16	0.13	0.58		0.04	0.48	
Clearance Time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7		4.6	5.7	
Vehicle Extension (s)	2.5	3.0	2.5	2.5	3.0	3.0	2.5	3.5		2.5	3.5	
Lane Grp Cap (vph)	65	206	371	151	296	246	433	2040		67	1661	
v/s Ratio Prot	0.02	0.04	c0.11	c0.08	c0.09		0.08	0.19		0.02	c0.43	
v/s Ratio Perm			0.10			0.00						
v/c Ratio	0.63	0.40	0.87	0.88	0.55	0.03	0.64	0.33		0.46	0.89	
Uniform Delay, d1	52.2	45.5	40.3	49.7	42.6	39.1	45.7	11.9		51.8	25.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.86	0.80		1.00	1.00	
Incremental Delay, d2	16.1	1.3	18.8	40.4	2.2	0.0	2.6	0.4		3.6	7.9	
Delay (s)	68.3	46.7	59.1	90.1	44.8	39.1	41.9	10.0		55.4	33.7	
Level of Service	E	D	E	F	D	D	D	A		E	C	
Approach Delay (s)		58.0			62.0			19.3			34.1	
Approach LOS		E			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	36.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	88.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	20	50	100	70	20	170	870	60	10	1580	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6		4.6	5.7		4.6	5.7	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.99		1.00	0.99	
Flt Protected	0.95	0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1739	1561	1770	1801		1770	5030		1770	5003	
Flt Permitted	0.95	0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1739	1561	1770	1801		1770	5030		1770	5003	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	41	20	51	102	71	20	173	888	61	10	1612	163
RTOR Reduction (vph)	0	0	46	0	9	0	0	5	0	0	9	0
Lane Group Flow (vph)	30	31	5	102	82	0	173	944	0	10	1766	0
Confl. Peds. (#/hr)			2									2
Confl. Bikes (#/hr)									1			2
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7									
Actuated Green, G (s)	9.8	9.8	9.8	8.3	8.3		15.9	71.8		0.6	56.5	
Effective Green, g (s)	9.8	9.8	9.8	8.3	8.3		15.9	71.8		0.6	56.5	
Actuated g/C Ratio	0.09	0.09	0.09	0.08	0.08		0.14	0.65		0.01	0.51	
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6		4.6	5.7		4.6	5.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		2.5	4.0		2.5	4.0	
Lane Grp Cap (vph)	149	154	139	133	135		255	3283		9	2569	
v/s Ratio Prot	c0.02	0.02		c0.06	0.05		c0.10	0.19		0.01	c0.35	
v/s Ratio Perm			0.00									
v/c Ratio	0.20	0.20	0.03	0.77	0.61		0.68	0.29		1.11	0.69	
Uniform Delay, d1	46.5	46.5	45.8	49.9	49.3		44.6	8.2		54.7	20.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.88	0.46		0.84	0.72	
Incremental Delay, d2	0.7	0.6	0.1	22.8	7.5		6.2	0.2		241.3	0.7	
Delay (s)	47.1	47.1	45.9	72.7	56.7		45.6	3.9		287.1	15.1	
Level of Service	D	D	D	E	E		D	A		F	B	
Approach Delay (s)		46.6			65.2			10.4			16.6	
Approach LOS		D			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	40	10	10	80	20	1010	40	20	1700	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			0.89		1.00	0.99		1.00	1.00	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1662			1634		1770	5051		1770	5080	
Flt Permitted		0.96			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1612			1597		1770	5051		1770	5080	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	10	10	41	10	10	82	20	1031	41	20	1735	10
RTOR Reduction (vph)	0	36	0	0	72	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	25	0	0	30	0	20	1070	0	20	1745	0
Confl. Peds. (#/hr)			5			2	5		3	2		4
Confl. Bikes (#/hr)												2
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		13.8			13.8		2.5	82.2		2.0	81.7	
Effective Green, g (s)		13.8			13.8		2.5	82.2		2.0	81.7	
Actuated g/C Ratio		0.13			0.13		0.02	0.75		0.02	0.74	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		202			200		40	3774		32	3773	
v/s Ratio Prot							c0.01	0.21		0.01	c0.34	
v/s Ratio Perm		0.02			c0.02							
v/c Ratio		0.12			0.15		0.50	0.28		0.62	0.46	
Uniform Delay, d1		42.7			42.9		53.1	4.5		53.6	5.5	
Progression Factor		1.00			1.00		1.00	1.00		0.57	0.08	
Incremental Delay, d2		0.3			0.4		9.5	0.2		26.0	0.3	
Delay (s)		43.0			43.2		62.6	4.6		56.5	0.8	
Level of Service		D			D		E	A		E	A	
Approach Delay (s)		43.0			43.2			5.7			1.4	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	360	600	380	640	150	600	840	240	110	1620	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	6.0	5.0	7.0	7.0	6.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1574	3433	5085	1548	3433	5085	1554	3433	5085	1560
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1574	3433	5085	1548	3433	5085	1554	3433	5085	1560
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	92	367	612	388	653	153	612	857	245	112	1653	133
RTOR Reduction (vph)	0	0	83	0	0	121	0	0	119	0	0	84
Lane Group Flow (vph)	92	367	529	388	653	32	612	857	126	112	1653	49
Confl. Peds. (#/hr)			1			8			4			2
Confl. Bikes (#/hr)			2									
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	7.8	20.7	51.3	19.0	31.9	31.9	30.6	77.4	77.4	9.3	55.1	55.1
Effective Green, g (s)	7.8	20.7	51.3	19.0	31.9	31.9	30.6	77.4	77.4	9.3	55.1	55.1
Actuated g/C Ratio	0.05	0.14	0.34	0.13	0.21	0.21	0.20	0.51	0.51	0.06	0.37	0.37
Clearance Time (s)	5.0	7.0	6.0	5.0	7.0	7.0	6.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	3.0	3.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	178	699	536	433	1078	328	698	2616	799	212	1862	571
v/s Ratio Prot	0.03	0.07	c0.20	c0.11	0.13		0.18	0.17		0.03	c0.33	
v/s Ratio Perm			0.14			0.02			0.08			0.03
v/c Ratio	0.52	0.53	0.99	0.90	0.61	0.10	0.88	0.33	0.16	0.53	0.89	0.09
Uniform Delay, d1	69.5	60.3	49.2	64.7	53.6	47.7	58.1	21.3	19.3	68.4	44.7	31.2
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
Incremental Delay, d2	2.5	1.4	35.2	20.5	1.4	0.3	12.0	0.1	0.1	2.4	5.7	0.1
Delay (s)	72.0	61.6	84.4	85.3	55.0	48.0	70.0	21.4	19.4	70.8	50.5	31.3
Level of Service	E	E	F	F	D	D	E	C	B	E	D	C
Approach Delay (s)		75.5			63.9			38.5			50.3	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	54.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	150.4	Sum of lost time (s)	25.0
Intersection Capacity Utilization	94.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	10	10	180	10	910	10	970	90	810	1640	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95		0.97	0.95	
Frpb, ped/bikes		1.00	0.98		1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.97	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1796	1557		1772	2765	1770	3489		3433	3531	
Flt Permitted		0.78	1.00		0.72	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1453	1557		1327	2765	1770	3489		3433	3531	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	20	10	10	184	10	929	10	990	92	827	1673	20
RTOR Reduction (vph)	0	0	8	0	0	44	0	6	0	0	1	0
Lane Group Flow (vph)	0	30	2	0	194	885	10	1076	0	827	1692	0
Confl. Peds. (#/hr)	6		3	3		6			2			7
Confl. Bikes (#/hr)			1						4			
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		20.6	20.6		20.6	52.3	0.6	42.8		31.7	73.9	
Effective Green, g (s)		20.6	20.6		20.6	52.3	0.6	42.8		31.7	73.9	
Actuated g/C Ratio		0.19	0.19		0.19	0.48	0.01	0.39		0.29	0.67	
Clearance Time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.5		3.0	3.5	
Lane Grp Cap (vph)		272	291		248	1430	9	1357		989	2372	
v/s Ratio Prot						0.18	c0.01	c0.31		c0.24	0.48	
v/s Ratio Perm		0.02	0.00		c0.15	0.14						
v/c Ratio		0.11	0.01		0.78	0.62	1.11	0.79		0.84	0.71	
Uniform Delay, d1		37.1	36.4		42.6	21.4	54.7	29.7		36.7	11.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2	0.0		14.8	0.8	342.2	4.8		6.2	1.9	
Delay (s)		37.3	36.4		57.3	22.3	396.9	34.5		43.0	13.2	
Level of Service		D	D		E	C	F	C		D	B	
Approach Delay (s)		37.1			28.3			37.8			23.0	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	27.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	30	40	90	10	230	10	790	30	310	1530	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.2		5.0	4.2	4.2	5.3		4.2	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.97	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1803	1562		1782	1574	1770	3516		1770	3523	
Flt Permitted		0.76	1.00		0.67	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1412	1562		1252	1574	1770	3516		1770	3523	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	51	31	41	92	10	235	10	806	31	316	1561	41
RTOR Reduction (vph)	0	0	35	0	0	0	0	2	0	0	1	0
Lane Group Flow (vph)	0	82	6	0	102	235	10	835	0	316	1601	0
Confl. Peds. (#/hr)	2					2			2			3
Confl. Bikes (#/hr)			1						1			
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		15.4	15.4		14.6	38.8	0.8	57.5		24.2	80.9	
Effective Green, g (s)		15.4	15.4		14.6	38.8	0.8	57.5		24.2	80.9	
Actuated g/C Ratio		0.14	0.14		0.13	0.35	0.01	0.52		0.22	0.73	
Clearance Time (s)		4.2	4.2		5.0	4.2	4.2	5.3		4.2	5.3	
Vehicle Extension (s)		3.0	3.0		3.5	2.0	2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		196	217		164	551	12	1824		386	2572	
v/s Ratio Prot						0.09	c0.01	0.24		c0.18	c0.45	
v/s Ratio Perm		0.06	0.00		c0.08	0.06						
v/c Ratio		0.42	0.03		0.62	0.43	0.83	0.46		0.82	0.62	
Uniform Delay, d1		43.6	41.2		45.5	27.5	54.9	16.8		41.2	7.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.4	0.0		7.5	0.2	163.6	0.8		12.1	1.1	
Delay (s)		45.1	41.3		53.0	27.7	218.5	17.6		53.3	8.5	
Level of Service		D	D		D	C	F	B		D	A	
Approach Delay (s)		43.8			35.3			20.0			15.9	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.8	Sum of lost time (s)	14.5
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	30	820	40	60	1600
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	31	837	41	61	1633
Pedestrians	4					4
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			354			
pX, platoon unblocked	0.93	0.93			0.93	
vC, conflicting volume	1800	447			882	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1711	259			725	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			92	
cM capacity (veh/h)	70	685			811	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	31	558	320	61	816	816
Volume Left	0	0	0	61	0	0
Volume Right	31	0	41	0	0	0
cSH	685	1700	1700	811	1700	1700
Volume to Capacity	0.04	0.33	0.19	0.08	0.48	0.48
Queue Length 95th (ft)	4	0	0	6	0	0
Control Delay (s)	10.5	0.0	0.0	9.8	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	10.5	0.0		0.4		
Approach LOS	B					

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	80	110	30	780	1610	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6		4.2	6.5	6.5	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frpb, ped/bikes	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.92		1.00	1.00	0.99	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1682		1770	3539	3516	
Flt Permitted	0.98		0.95	1.00	1.00	
Satd. Flow (perm)	1682		1770	3539	3516	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	82	112	31	796	1643	61
RTOR Reduction (vph)	55	0	0	0	2	0
Lane Group Flow (vph)	139	0	31	796	1702	0
Confl. Peds. (#/hr)						4
Turn Type	Prot		Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases						
Actuated Green, G (s)	14.0		2.9	74.9	67.8	
Effective Green, g (s)	14.0		2.9	74.9	67.8	
Actuated g/C Ratio	0.14		0.03	0.75	0.68	
Clearance Time (s)	4.6		4.2	6.5	6.5	
Vehicle Extension (s)	3.0		3.0	4.0	4.0	
Lane Grp Cap (vph)	235		51	2650	2383	
v/s Ratio Prot	c0.08		c0.02	0.22	c0.48	
v/s Ratio Perm						
v/c Ratio	0.59		0.61	0.30	0.71	
Uniform Delay, d1	40.3		48.0	4.1	10.1	
Progression Factor	1.00		0.66	0.74	1.00	
Incremental Delay, d2	3.9		18.4	0.3	1.9	
Delay (s)	44.3		50.1	3.3	11.9	
Level of Service	D		D	A	B	
Approach Delay (s)	44.3			5.0	11.9	
Approach LOS	D			A	B	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	20	80	30	10	40	40	740	10	30	1650	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6		4.7	5.7		4.7	5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.88		1.00	0.88		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1621		1770	1638		1770	3531		1770	3521	
Flt Permitted	0.72	1.00		0.63	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1348	1621		1170	1638		1770	3531		1770	3521	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	31	20	82	31	10	41	41	755	10	31	1684	51
RTOR Reduction (vph)	0	74	0	0	37	0	0	1	0	0	1	0
Lane Group Flow (vph)	31	28	0	31	14	0	41	764	0	31	1734	0
Confl. Peds. (#/hr)			1						2			1
Confl. Bikes (#/hr)									2			
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	9.3	9.3		9.3	9.3		3.2	71.9		3.8	72.5	
Effective Green, g (s)	9.3	9.3		9.3	9.3		3.2	71.9		3.8	72.5	
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.03	0.72		0.04	0.72	
Clearance Time (s)	4.6	4.6		4.6	4.6		4.7	5.7		4.7	5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	125	150		108	152		56	2538		67	2552	
v/s Ratio Prot		0.02			0.01		c0.02	0.22		0.02	c0.49	
v/s Ratio Perm	0.02			c0.03								
v/c Ratio	0.25	0.18		0.29	0.09		0.73	0.30		0.46	0.68	
Uniform Delay, d1	42.1	41.8		42.3	41.5		48.0	5.0		47.1	7.5	
Progression Factor	1.00	1.00		1.00	1.00		1.07	0.27		0.93	0.18	
Incremental Delay, d2	1.0	0.6		1.5	0.3		37.3	0.3		3.9	1.1	
Delay (s)	43.1	42.4		43.7	41.7		88.4	1.6		47.8	2.5	
Level of Service	D	D		D	D		F	A		D	A	
Approach Delay (s)		42.6			42.5			6.0			3.3	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	40	230	170	40	40	440	720	180	60	1640	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0		4.6	5.7		4.6	6.7	
Lane Util. Factor		1.00	1.00	1.00	1.00		0.97	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.93		1.00	0.97		1.00	0.99	
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1823	1583	1770	1710		3433	4906		1770	5056	
Flt Permitted		0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1823	1583	1770	1710		3433	4906		1770	5056	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	31	41	235	173	41	41	449	735	184	61	1673	61
RTOR Reduction (vph)	0	0	108	0	36	0	0	32	0	0	3	0
Lane Group Flow (vph)	0	72	127	173	46	0	449	887	0	61	1731	0
Confl. Peds. (#/hr)			5						2			2
Confl. Bikes (#/hr)						1			1			
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4	4 5	3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		12.0	25.6	8.0	8.0		13.6	52.6		7.1	45.1	
Effective Green, g (s)		12.0	25.6	8.0	8.0		13.6	52.6		7.1	45.1	
Actuated g/C Ratio		0.12	0.26	0.08	0.08		0.14	0.53		0.07	0.45	
Clearance Time (s)		5.0		5.0	5.0		4.6	5.7		4.6	6.7	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)		218	405	141	136		466	2580		125	2280	
v/s Ratio Prot		c0.04	0.08	c0.10	0.03		c0.13	0.18		0.03	c0.34	
v/s Ratio Perm												
v/c Ratio		0.33	0.31	1.23	0.34		0.96	0.34		0.49	0.76	
Uniform Delay, d1		40.3	30.1	46.0	43.5		43.0	13.7		44.7	22.9	
Progression Factor		1.00	1.00	1.00	1.00		0.54	0.25		0.90	0.65	
Incremental Delay, d2		0.9	0.4	149.3	1.5		29.8	0.3		2.4	1.9	
Delay (s)		41.2	30.5	195.3	45.0		53.1	3.8		42.7	16.8	
Level of Service		D	C	F	D		D	A		D	B	
Approach Delay (s)		33.0			147.0			19.9			17.7	
Approach LOS		C			F			B			B	

Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	110	670	480	230	250	290	1050	900	50	1950	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	6.3	6.3	5.6	6.3	6.3	5.6	6.3	6.3	5.6	6.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	0.88	0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3539	1583	3433	3539	1560	3433	5085	2787	3433	5069	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	3539	1583	3433	3539	1560	3433	5085	2787	3433	5069	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	41	112	684	490	235	255	296	1071	918	51	1990	41
RTOR Reduction (vph)	0	0	124	0	0	162	0	0	420	0	2	0
Lane Group Flow (vph)	41	112	560	490	235	93	296	1071	498	51	2029	0
Confl. Peds. (#/hr)						2			10			
Confl. Bikes (#/hr)												1
Turn Type	Prot	NA	pt+ov	Prot	NA	Perm	Prot	NA	pt+ov	Prot	NA	
Protected Phases	7	4	4 5	3	8		5	2	2 3	1	6	
Permitted Phases						8						
Actuated Green, G (s)	4.0	19.7	28.1	15.7	31.4	31.4	8.4	35.5	56.8	5.3	32.4	
Effective Green, g (s)	4.0	19.7	28.1	15.7	31.4	31.4	8.4	35.5	51.2	5.3	32.4	
Actuated g/C Ratio	0.04	0.20	0.28	0.16	0.31	0.31	0.08	0.36	0.51	0.05	0.32	
Clearance Time (s)	5.6	6.3		5.6	6.3	6.3	5.6	6.3		5.6	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	137	697	444	538	1111	489	288	1805	1426	181	1642	
v/s Ratio Prot	0.01	0.03	c0.35	c0.14	0.07		0.09	0.21	0.18	0.01	c0.40	
v/s Ratio Perm						0.06						
v/c Ratio	0.30	0.16	1.26	0.91	0.21	0.19	1.03	0.59	0.35	0.28	1.24	
Uniform Delay, d1	46.6	33.3	36.0	41.5	25.2	25.0	45.8	26.4	14.5	45.5	33.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.16	0.67	1.14	0.62	0.55	
Incremental Delay, d2	1.2	0.1	134.3	19.6	0.1	0.2	58.3	1.3	0.1	0.6	109.7	
Delay (s)	47.9	33.4	170.2	61.1	25.3	25.2	111.4	18.9	16.7	28.7	128.2	
Level of Service	D	C	F	E	C	C	F	B	B	C	F	
Approach Delay (s)		145.9			43.2			30.0			125.8	
Approach LOS		F			D			C			F	

Intersection Summary			
HCM 2000 Control Delay	80.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	23.8
Intersection Capacity Utilization	108.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	690	210	0	1550	2020	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		6.3	6.3	
Lane Util. Factor	0.97	1.00		0.86	0.81	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3433	1583		6408	7544	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3433	1583		6408	7544	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	704	214	0	1582	2061	0
RTOR Reduction (vph)	0	2	0	0	0	0
Lane Group Flow (vph)	704	212	0	1582	2061	0
Confl. Bikes (#/hr)						1
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	25.8	25.8		62.3	62.3	
Effective Green, g (s)	25.8	25.8		62.3	62.3	
Actuated g/C Ratio	0.26	0.26		0.62	0.62	
Clearance Time (s)	5.6	5.6		6.3	6.3	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	885	408		3992	4699	
v/s Ratio Prot	c0.21			0.25	c0.27	
v/s Ratio Perm		0.13				
v/c Ratio	0.80	0.52		0.40	0.44	
Uniform Delay, d1	34.6	31.8		9.4	9.8	
Progression Factor	1.00	1.00		0.46	0.57	
Incremental Delay, d2	4.7	0.5		0.2	0.0	
Delay (s)	39.3	32.3		4.6	5.6	
Level of Service	D	C		A	A	
Approach Delay (s)	37.7			4.6	5.6	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		

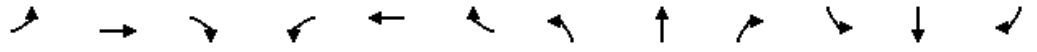
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	20	10	110	20	430	50	1060	280	780	1360	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		4.2	5.6	5.6	5.2	5.3	5.3	5.2	5.3	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.91	1.00	0.97	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1762		1770	1863	1583	1770	5085	1546	3433	5030	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1762		1770	1863	1583	1770	5085	1546	3433	5030	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	61	20	10	112	20	439	51	1082	286	796	1388	92
RTOR Reduction (vph)	0	9	0	0	0	100	0	0	138	0	6	0
Lane Group Flow (vph)	61	21	0	112	20	339	51	1082	148	796	1474	0
Confl. Peds. (#/hr)			1						7			1
Confl. Bikes (#/hr)									2			1
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8	8 1	5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	6.8	8.4		13.8	14.0	38.0	6.1	33.5	33.5	24.0	51.4	
Effective Green, g (s)	6.8	8.4		13.8	14.0	38.0	6.1	33.5	33.5	24.0	51.4	
Actuated g/C Ratio	0.07	0.08		0.14	0.14	0.38	0.06	0.34	0.34	0.24	0.51	
Clearance Time (s)	5.6	5.6		4.2	5.6		5.2	5.3	5.3	5.2	5.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	2.0	2.0	3.0	2.0	
Lane Grp Cap (vph)	120	148		244	260	601	107	1703	517	823	2585	
v/s Ratio Prot	c0.03	0.01		0.06	0.01	c0.21	0.03	c0.21		c0.23	0.29	
v/s Ratio Perm									0.10			
v/c Ratio	0.51	0.14		0.46	0.08	0.56	0.48	0.64	0.29	0.97	0.57	
Uniform Delay, d1	45.0	42.5		39.7	37.4	24.5	45.4	28.1	24.5	37.6	16.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.58	0.33	
Incremental Delay, d2	3.4	0.4		1.4	0.1	1.2	3.3	1.8	1.4	22.2	0.8	
Delay (s)	48.3	42.9		41.0	37.5	25.7	48.7	29.9	25.8	43.8	6.3	
Level of Service	D	D		D	D	C	D	C	C	D	A	
Approach Delay (s)		46.5			29.1			29.8			19.4	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	24.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	21.7
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	170	460	90	100	50	420	1260	130	50	860	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7		4.6	5.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1572	1770	1863	1583	3433	3482		1770	3472	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1572	1770	1863	1583	3433	3482		1770	3472	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	255	173	469	92	102	51	429	1286	133	51	878	112
RTOR Reduction (vph)	0	0	73	0	0	46	0	5	0	0	7	0
Lane Group Flow (vph)	255	173	396	92	102	5	429	1414	0	51	983	0
Confl. Peds. (#/hr)			1									2
Confl. Bikes (#/hr)									2			2
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	21.8	23.6	45.0	11.2	13.0	13.0	21.4	68.4		6.6	52.5	
Effective Green, g (s)	21.8	23.6	45.0	11.2	13.0	13.0	21.4	68.4		6.6	52.5	
Actuated g/C Ratio	0.17	0.18	0.35	0.09	0.10	0.10	0.16	0.53		0.05	0.40	
Clearance Time (s)	5.3	5.3	5.7	4.6	4.6	4.6	5.7	5.7		4.6	5.7	
Vehicle Extension (s)	2.5	3.0	2.5	2.5	3.0	3.0	2.5	3.5		2.5	3.5	
Lane Grp Cap (vph)	296	338	544	152	186	158	565	1832		89	1402	
v/s Ratio Prot	c0.14	0.09	c0.12	0.05	0.05		0.12	c0.41		0.03	c0.28	
v/s Ratio Perm			0.13			0.00						
v/c Ratio	0.86	0.51	0.73	0.61	0.55	0.03	0.76	0.77		0.57	0.70	
Uniform Delay, d1	52.6	48.0	37.2	57.3	55.7	52.8	51.8	24.6		60.3	32.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.59	0.23		1.00	1.00	
Incremental Delay, d2	21.6	1.3	4.6	5.6	3.3	0.1	4.7	2.7		7.1	2.9	
Delay (s)	74.2	49.3	41.7	62.9	59.0	52.9	35.1	8.2		67.4	35.2	
Level of Service	E	D	D	E	E	D	D	A		E	D	
Approach Delay (s)		52.4			59.2			14.5			36.8	
Approach LOS		D			E			B			D	

Intersection Summary			
HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	80	170	80	30	10	110	1690	170	20	1310	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6		4.6	5.7		4.6	5.7	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.99		1.00	0.99	
Flt Protected	0.95	0.99	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1755	1550	1770	1795		1770	5006		1770	5035	
Flt Permitted	0.95	0.99	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1755	1550	1770	1795		1770	5006		1770	5035	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	112	82	173	82	31	10	112	1724	173	20	1337	82
RTOR Reduction (vph)	0	0	154	0	9	0	0	7	0	0	4	0
Lane Group Flow (vph)	95	99	19	82	32	0	112	1890	0	20	1415	0
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			1						2			2
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7									
Actuated Green, G (s)	14.6	14.6	14.6	10.9	10.9		15.4	81.5		3.5	69.6	
Effective Green, g (s)	14.6	14.6	14.6	10.9	10.9		15.4	81.5		3.5	69.6	
Actuated g/C Ratio	0.11	0.11	0.11	0.08	0.08		0.12	0.63		0.03	0.54	
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6		4.6	5.7		4.6	5.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		2.5	4.0		2.5	4.0	
Lane Grp Cap (vph)	188	197	174	148	150		209	3138		47	2695	
v/s Ratio Prot	c0.06	0.06		c0.05	0.02		c0.06	c0.38		0.01	0.28	
v/s Ratio Perm			0.01									
v/c Ratio	0.51	0.50	0.11	0.55	0.21		0.54	0.60		0.43	0.52	
Uniform Delay, d1	54.3	54.3	51.9	57.2	55.5		53.9	14.5		62.3	19.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.87	0.11		0.84	0.81	
Incremental Delay, d2	2.1	2.0	0.3	4.4	0.7		1.8	0.8		3.1	0.5	
Delay (s)	56.4	56.3	52.2	61.7	56.3		48.5	2.4		55.6	16.2	
Level of Service	E	E	D	E	E		D	A		E	B	
Approach Delay (s)		54.4			59.9			4.9			16.8	
Approach LOS		D			E			A			B	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	30	10	10	50	40	1910	50	30	1510	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.99			0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.92			0.90		1.00	1.00		1.00	1.00	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1669			1637		1770	5055		1770	5072	
Flt Permitted		0.96			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1611			1582		1770	5055		1770	5072	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	10	10	31	10	10	51	41	1949	51	31	1541	20
RTOR Reduction (vph)	0	28	0	0	46	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	23	0	0	25	0	41	1999	0	31	1561	0
Confl. Peds. (#/hr)			13			17	13		21	17		9
Confl. Bikes (#/hr)									4			1
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		12.7			12.7		6.4	101.7		3.6	98.9	
Effective Green, g (s)		12.7			12.7		6.4	101.7		3.6	98.9	
Actuated g/C Ratio		0.10			0.10		0.05	0.78		0.03	0.76	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		157			154		87	3954		49	3858	
v/s Ratio Prot							0.02	c0.40		0.02	c0.31	
v/s Ratio Perm		0.01			c0.02							
v/c Ratio		0.15			0.16		0.47	0.51		0.63	0.40	
Uniform Delay, d1		53.7			53.8		60.2	5.1		62.5	5.4	
Progression Factor		1.00			1.00		1.28	0.40		0.64	0.23	
Incremental Delay, d2		0.4			0.5		2.2	0.3		21.2	0.3	
Delay (s)		54.1			54.3		79.2	2.3		61.5	1.5	
Level of Service		D			D		E	A		E	A	
Approach Delay (s)		54.1			54.3			3.8			2.7	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	340	840	730	360	700	250	510	1490	280	320	1150	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	6.0	5.0	7.0	7.0	6.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1561	3433	5085	1533	3433	5085	1547	3433	5085	1528
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1561	3433	5085	1533	3433	5085	1547	3433	5085	1528
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	347	857	745	367	714	255	520	1520	286	327	1173	153
RTOR Reduction (vph)	0	0	67	0	0	181	0	0	159	0	0	113
Lane Group Flow (vph)	347	857	678	367	714	74	520	1520	127	327	1173	40
Confl. Peds. (#/hr)			11			18			8			18
Confl. Bikes (#/hr)			2									
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	13.0	31.0	56.0	15.0	33.0	33.0	25.0	45.4	45.4	14.6	34.0	34.0
Effective Green, g (s)	13.0	31.0	56.0	15.0	33.0	33.0	25.0	45.4	45.4	14.6	34.0	34.0
Actuated g/C Ratio	0.10	0.24	0.43	0.12	0.25	0.25	0.19	0.35	0.35	0.11	0.26	0.26
Clearance Time (s)	5.0	7.0	6.0	5.0	7.0	7.0	6.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	3.0	3.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	343	1212	672	396	1290	389	660	1775	540	385	1329	399
v/s Ratio Prot	0.10	0.17	c0.19	c0.11	0.14		0.15	c0.30		0.10	c0.23	
v/s Ratio Perm			0.24			0.05			0.08			0.03
v/c Ratio	1.01	0.71	1.01	0.93	0.55	0.19	0.79	0.86	0.23	0.85	0.88	0.10
Uniform Delay, d1	58.5	45.3	37.0	57.0	42.1	38.0	50.0	39.3	30.0	56.6	46.1	36.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.73	0.74	1.31
Incremental Delay, d2	51.6	2.4	37.1	27.4	0.9	0.5	6.2	5.6	1.0	15.2	8.3	0.5
Delay (s)	110.1	47.7	74.1	84.3	43.0	38.5	56.2	44.8	31.0	56.4	42.3	48.3
Level of Service	F	D	E	F	D	D	E	D	C	E	D	D
Approach Delay (s)		68.9			53.5			45.7			45.7	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	53.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	10	80	10	830	20	1650	150	910	1310	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Lane Util. Factor		1.00	1.00		1.00	0.88	1.00	0.95		0.97	0.95	
Frpb, ped/bikes		1.00	0.98		1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1814	1551		1779	2772	1770	3489		3433	3529	
Flt Permitted		0.86	1.00		0.73	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1607	1551		1365	2772	1770	3489		3433	3529	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	10	10	10	82	10	847	20	1684	153	929	1337	20
RTOR Reduction (vph)	0	0	9	0	0	39	0	5	0	0	1	0
Lane Group Flow (vph)	0	20	1	0	92	808	20	1832	0	929	1356	0
Confl. Peds. (#/hr)	3		2	2		3			5			8
Confl. Bikes (#/hr)			3									3
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		15.6	15.6		15.6	47.7	2.7	67.4		32.1	96.8	
Effective Green, g (s)		15.6	15.6		15.6	47.7	2.7	67.4		32.1	96.8	
Actuated g/C Ratio		0.12	0.12		0.12	0.37	0.02	0.52		0.25	0.74	
Clearance Time (s)		4.6	4.6		4.6	4.6	4.6	5.7		4.6	5.7	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.5		3.0	3.5	
Lane Grp Cap (vph)		192	186		163	1115	36	1808		847	2627	
v/s Ratio Prot						c0.18	0.01	c0.53		c0.27	0.38	
v/s Ratio Perm		0.01	0.00		0.07	0.11						
v/c Ratio		0.10	0.01		0.56	0.73	0.56	1.01		1.10	0.52	
Uniform Delay, d1		51.0	50.4		54.0	35.5	63.1	31.3		49.0	6.9	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2	0.0		4.4	2.4	17.3	24.5		60.8	0.7	
Delay (s)		51.2	50.4		58.4	37.9	80.3	55.8		109.8	7.6	
Level of Service		D	D		E	D	F	E		F	A	
Approach Delay (s)		50.9			39.9			56.1			49.1	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	50.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	101.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	20	30	60	30	360	50	1420	60	270	1070	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.2		5.0	4.2	4.2	5.3		4.2	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.97		1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1793	1542		1799	1571	1770	3514		1770	3511	
Flt Permitted		0.74	1.00		0.76	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1364	1542		1419	1571	1770	3514		1770	3511	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	41	20	31	61	31	367	51	1449	61	276	1092	61
RTOR Reduction (vph)	0	0	27	0	0	0	0	2	0	0	2	0
Lane Group Flow (vph)	0	61	4	0	92	367	51	1508	0	276	1151	0
Confl. Peds. (#/hr)	4		5	2		4			2			
Confl. Bikes (#/hr)			3						1			
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		15.2	15.2		14.4	38.3	6.9	77.7		23.9	94.7	
Effective Green, g (s)		15.2	15.2		14.4	38.3	6.9	77.7		23.9	94.7	
Actuated g/C Ratio		0.12	0.12		0.11	0.29	0.05	0.60		0.18	0.73	
Clearance Time (s)		4.2	4.2		5.0	4.2	4.2	5.3		4.2	5.3	
Vehicle Extension (s)		3.0	3.0		3.5	2.0	2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		158	179		156	461	93	2092		324	2547	
v/s Ratio Prot						c0.15	0.03	c0.43		c0.16	0.33	
v/s Ratio Perm		0.04	0.00		0.06	0.09						
v/c Ratio		0.39	0.02		0.59	0.80	0.55	0.72		0.85	0.45	
Uniform Delay, d1		53.3	51.1		55.2	42.5	60.3	18.7		51.6	7.3	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.6	0.0		6.0	8.6	3.5	2.2		18.3	0.6	
Delay (s)		54.9	51.1		61.2	51.1	63.8	20.9		69.9	7.9	
Level of Service		D	D		E	D	E	C		E	A	
Approach Delay (s)		53.6			53.2			22.3			19.9	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	130.5	Sum of lost time (s)	14.5
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	30	1520	70	40	1120
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	31	1551	71	41	1143
Pedestrians	5					4
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			350			
pX, platoon unblocked	0.82	0.82			0.82	
vC, conflicting volume	2245	820			1627	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2079	342			1326	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	94			90	
cM capacity (veh/h)	34	532			422	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	31	1034	588	41	571	571
Volume Left	0	0	0	41	0	0
Volume Right	31	0	71	0	0	0
cSH	532	1700	1700	422	1700	1700
Volume to Capacity	0.06	0.61	0.35	0.10	0.34	0.34
Queue Length 95th (ft)	5	0	0	8	0	0
Control Delay (s)	12.2	0.0	0.0	14.4	0.0	0.0
Lane LOS	B			B		
Approach Delay (s)	12.2	0.0		0.5		
Approach LOS	B					

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	55.5%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	70	70	120	1520	1050	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6		4.2	6.5	6.5	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frpb, ped/bikes	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.93		1.00	1.00	0.99	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1695		1770	3539	3494	
Flt Permitted	0.98		0.95	1.00	1.00	
Satd. Flow (perm)	1695		1770	3539	3494	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	71	71	122	1551	1071	82
RTOR Reduction (vph)	37	0	0	0	4	0
Lane Group Flow (vph)	105	0	122	1551	1149	0
Confl. Peds. (#/hr)						3
Confl. Bikes (#/hr)						2
Turn Type	Prot		Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases						
Actuated Green, G (s)	13.0		16.8	85.9	64.9	
Effective Green, g (s)	13.0		16.8	85.9	64.9	
Actuated g/C Ratio	0.12		0.15	0.78	0.59	
Clearance Time (s)	4.6		4.2	6.5	6.5	
Vehicle Extension (s)	3.0		3.0	4.0	4.0	
Lane Grp Cap (vph)	200		270	2763	2061	
v/s Ratio Prot	c0.06		0.07	c0.44	0.33	
v/s Ratio Perm						
v/c Ratio	0.52		0.45	0.56	0.56	
Uniform Delay, d1	45.6		42.4	4.7	13.8	
Progression Factor	1.00		0.68	0.09	1.00	
Incremental Delay, d2	2.5		1.0	0.7	1.1	
Delay (s)	48.1		30.0	1.1	14.9	
Level of Service	D		C	A	B	
Approach Delay (s)	48.1			3.2	14.9	
Approach LOS	D			A	B	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	30	60	30	20	40	90	1580	80	40	1050	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6		4.7	5.7		4.7	5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.90		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1677		1770	1659		1770	3509		1770	3516	
Flt Permitted	0.72	1.00		0.64	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1336	1677		1186	1659		1770	3509		1770	3516	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	20	31	61	31	20	41	92	1612	82	41	1071	41
RTOR Reduction (vph)	0	56	0	0	37	0	0	2	0	0	2	0
Lane Group Flow (vph)	20	36	0	31	24	0	92	1692	0	41	1110	0
Confl. Peds. (#/hr)									2			3
Confl. Bikes (#/hr)						1			1			2
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	9.4	9.4		9.4	9.4		9.2	81.8		3.8	76.4	
Effective Green, g (s)	9.4	9.4		9.4	9.4		9.2	81.8		3.8	76.4	
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.08	0.74		0.03	0.69	
Clearance Time (s)	4.6	4.6		4.6	4.6		4.7	5.7		4.7	5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	114	143		101	141		148	2609		61	2442	
v/s Ratio Prot		0.02			0.01		0.05	c0.48		c0.02	0.32	
v/s Ratio Perm	0.01			c0.03								
v/c Ratio	0.18	0.25		0.31	0.17		0.62	0.65		0.67	0.45	
Uniform Delay, d1	46.7	47.0		47.2	46.7		48.7	7.0		52.5	7.5	
Progression Factor	1.00	1.00		1.00	1.00		1.42	0.45		0.71	0.21	
Incremental Delay, d2	0.7	0.9		1.7	0.6		5.3	0.8		22.2	0.5	
Delay (s)	47.4	48.0		49.0	47.2		74.3	4.0		59.5	2.1	
Level of Service	D	D		D	D		E	A		E	A	
Approach Delay (s)		47.9			47.8			7.6			4.1	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	60	540	190	70	130	470	1490	220	70	970	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0		4.6	5.7		4.6	6.7	
Lane Util. Factor		1.00	1.00	1.00	1.00		0.97	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.90		1.00	0.98		1.00	0.99	
Flt Protected		0.97	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1801	1583	1770	1665		3433	4970		1770	5001	
Flt Permitted		0.97	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1801	1583	1770	1665		3433	4970		1770	5001	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	133	61	551	194	71	133	480	1520	224	71	990	102
RTOR Reduction (vph)	0	0	85	0	61	0	0	16	0	0	10	0
Lane Group Flow (vph)	0	194	466	194	143	0	480	1728	0	71	1082	0
Confl. Peds. (#/hr)			17						2			8
Confl. Bikes (#/hr)						1			1			1
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4	4 5	3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		19.8	39.2	13.7	13.7		19.4	49.8		6.4	35.8	
Effective Green, g (s)		19.8	39.2	13.7	13.7		19.4	49.8		6.4	35.8	
Actuated g/C Ratio		0.18	0.36	0.12	0.12		0.18	0.45		0.06	0.33	
Clearance Time (s)		5.0		5.0	5.0		4.6	5.7		4.6	6.7	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)		324	564	220	207		605	2250		102	1627	
v/s Ratio Prot		0.11	c0.29	c0.11	0.09		0.14	c0.35		0.04	c0.22	
v/s Ratio Perm												
v/c Ratio		0.60	0.83	0.88	0.69		0.79	0.77		0.70	0.66	
Uniform Delay, d1		41.4	32.3	47.4	46.1		43.4	25.3		50.8	31.9	
Progression Factor		1.00	1.00	1.00	1.00		0.57	0.32		0.81	0.63	
Incremental Delay, d2		3.0	9.6	31.1	9.2		4.6	1.7		17.4	2.0	
Delay (s)		44.4	41.9	78.5	55.3		29.3	9.8		58.3	22.0	
Level of Service		D	D	E	E		C	A		E	C	
Approach Delay (s)		42.6			66.6			14.0			24.2	
Approach LOS		D			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	180	660	530	440	350	380	1690	680	50	1550	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	6.3	6.3	5.6	6.3	6.3	5.6	6.3	6.3	5.6	6.3	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	0.88	0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3539	1583	3433	3539	1560	3433	5085	2787	3433	5035	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	3539	1583	3433	3539	1560	3433	5085	2787	3433	5035	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	143	184	673	541	449	357	388	1724	694	51	1582	102
RTOR Reduction (vph)	0	0	104	0	0	159	0	0	202	0	7	0
Lane Group Flow (vph)	143	184	569	541	449	198	388	1724	492	51	1677	0
Confl. Peds. (#/hr)						2			12			
Confl. Bikes (#/hr)												2
Turn Type	Prot	NA	pt+ov	Prot	NA	Perm	Prot	NA	pt+ov	Prot	NA	
Protected Phases	7	4	4 5	3	8		5	2	2 3	1	6	
Permitted Phases						8						
Actuated Green, G (s)	16.1	22.7	34.1	15.4	22.0	22.0	11.4	44.1	59.5	4.0	36.7	
Effective Green, g (s)	16.1	22.7	34.1	15.4	22.0	22.0	11.4	44.1	59.5	4.0	36.7	
Actuated g/C Ratio	0.15	0.21	0.31	0.14	0.20	0.20	0.10	0.40	0.54	0.04	0.33	
Clearance Time (s)	5.6	6.3		5.6	6.3	6.3	5.6	6.3		5.6	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	502	730	490	480	707	312	355	2038	1507	124	1679	
v/s Ratio Prot	0.04	0.05	c0.36	c0.16	0.13		0.11	0.34	0.18	0.01	c0.33	
v/s Ratio Perm						0.13						
v/c Ratio	0.28	0.25	1.16	1.13	0.64	0.63	1.09	0.85	0.33	0.41	1.00	
Uniform Delay, d1	41.8	36.5	37.9	47.3	40.3	40.3	49.3	29.9	14.1	51.8	36.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.87	1.00	1.11	1.13	0.68	
Incremental Delay, d2	0.3	0.2	93.0	80.7	1.9	4.2	71.9	4.0	0.1	1.5	18.0	
Delay (s)	42.1	36.7	131.0	128.0	42.2	44.5	114.8	34.0	15.7	60.2	43.0	
Level of Service	D	D	F	F	D	D	F	C	B	E	D	
Approach Delay (s)		100.9			77.3			40.6			43.5	
Approach LOS		F			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	57.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	23.8
Intersection Capacity Utilization	103.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	760	360	0	1990	1730	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		6.3	6.3	
Lane Util. Factor	0.97	1.00		0.86	0.81	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3433	1583		6408	7544	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3433	1583		6408	7544	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	776	367	0	2031	1765	0
RTOR Reduction (vph)	0	5	0	0	0	0
Lane Group Flow (vph)	776	362	0	2031	1765	0
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	31.5	31.5		66.6	66.6	
Effective Green, g (s)	31.5	31.5		66.6	66.6	
Actuated g/C Ratio	0.29	0.29		0.61	0.61	
Clearance Time (s)	5.6	5.6		6.3	6.3	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	983	453		3879	4567	
v/s Ratio Prot	0.23			c0.32	0.23	
v/s Ratio Perm		c0.23				
v/c Ratio	0.79	0.80		0.52	0.39	
Uniform Delay, d1	36.2	36.3		12.5	11.2	
Progression Factor	1.00	1.00		0.42	0.77	
Incremental Delay, d2	4.0	8.9		0.2	0.0	
Delay (s)	40.1	45.2		5.4	8.6	
Level of Service	D	D		A	A	
Approach Delay (s)	41.8			5.4	8.6	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	60	30	200	20	570	30	1250	320	920	1100	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6	5.6	5.2	5.3	5.3	5.2	5.3	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.91	1.00	0.97	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1754		1770	1863	1583	1770	5085	1535	3433	5034	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1754		1770	1863	1583	1770	5085	1535	3433	5034	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	173	61	31	204	20	582	31	1276	327	939	1122	71
RTOR Reduction (vph)	0	18	0	0	0	73	0	0	145	0	6	0
Lane Group Flow (vph)	173	74	0	204	20	509	31	1276	182	939	1187	0
Confl. Peds. (#/hr)			7						9			
Confl. Bikes (#/hr)			4						4			1
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8	8 1	5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	14.7	21.9		14.8	22.0	48.6	3.7	25.0	25.0	26.6	47.9	
Effective Green, g (s)	14.7	21.9		14.8	22.0	48.6	3.7	25.0	25.0	26.6	47.9	
Actuated g/C Ratio	0.13	0.20		0.13	0.20	0.44	0.03	0.23	0.23	0.24	0.44	
Clearance Time (s)	5.6	5.6		5.6	5.6		5.2	5.3	5.3	5.2	5.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	2.0	2.0	3.0	2.0	
Lane Grp Cap (vph)	236	349		238	372	699	59	1155	348	830	2192	
v/s Ratio Prot	c0.10	0.04		0.12	0.01	c0.32	0.02	c0.25		c0.27	0.24	
v/s Ratio Perm									0.12			
v/c Ratio	0.73	0.21		0.86	0.05	0.73	0.53	1.10	0.52	1.13	0.54	
Uniform Delay, d1	45.8	36.8		46.6	35.6	25.3	52.3	42.5	37.3	41.7	22.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.75	0.48	
Incremental Delay, d2	11.2	0.3		24.9	0.1	3.8	8.2	60.0	5.5	73.1	0.9	
Delay (s)	56.9	37.2		71.4	35.6	29.1	60.5	102.5	42.8	104.5	12.0	
Level of Service	E	D		E	D	C	E	F	D	F	B	
Approach Delay (s)		50.1			39.9			89.8			52.7	
Approach LOS		D			D			F			D	

Intersection Summary			
HCM 2000 Control Delay	63.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.7
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Arterial Level of Service: NB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Plaza Dr	II	35	25.3	29.5	54.8	0.20	13.3	E
78EB Off Ramp	II	35	6.3	4.8	11.1	0.05	16.3	E
Vista Way	II	41	12.2	17.3	29.5	0.11	12.9	F
Waring Rd	II	35	20.0	3.9	23.9	0.16	24.1	C
Roselle Ave	II	50	35.6	1.9	37.5	0.41	39.7	A
Marvin St W	II	45	24.7	3.8	28.5	0.24	30.0	B
Thunder Dr	II	43	37.7	19.8	57.5	0.40	25.1	C
Olive Dr	II	45	35.9	36.0	71.9	0.38	19.1	D
	II	45	17.5	12.5	30.0	0.16	19.2	D
Oceanside Blvd	II	45	6.9	22.4	29.3	0.06	7.7	F
Aztec St	II	45	27.7	6.8	34.5	0.27	27.8	C
Avda De La Plata	II	45	18.9	4.0	22.9	0.17	27.3	C
Old Grove Rd	II	45	29.1	10.2	39.3	0.29	26.9	C
Total	II		297.8	172.9	470.7	2.91	22.3	C

Arterial Level of Service: SB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Old Grove Rd	II	45	30.7	29.0	59.7	0.31	18.7	D
Avda De La Plata	II	45	29.1	14.5	43.6	0.29	24.3	C
Aztec St	II	45	18.9	1.0	19.9	0.17	31.4	B
Oceanside Blvd	II	45	27.7	52.0	79.7	0.27	12.0	F
	II	45	6.9	16.9	23.8	0.06	9.5	F
Olive Dr	II	45	17.5	12.4	29.9	0.16	19.3	D
Thunder Dr	II	45	35.9	8.1	44.0	0.38	31.3	B
Marvin St W	II	45	37.7	13.1	50.8	0.40	28.4	B
Roselle Ave	II	40	26.2	2.9	29.1	0.24	29.4	B
Barnard Dr	II	50	35.6	18.3	53.9	0.41	27.7	C
Vista Way	II	35	20.0	94.6	114.6	0.16	5.0	F
78EB Off Ramp	II	38	12.2	5.9	18.1	0.11	21.1	D
Plaza Dr	II	35	6.3	6.4	12.7	0.05	14.2	E
Total	II		304.7	275.1	579.8	3.02	18.8	D

Arterial Level of Service: NB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Plaza Dr	II	35	25.1	83.5	108.6	0.20	6.7	F
78EB Off Ramp	II	35	5.7	5.8	11.5	0.05	14.2	E
Vista Way	II	41	12.4	33.3	45.7	0.11	8.5	F
Waring Rd	II	35	19.6	10.4	30.0	0.16	18.8	D
Roselle Ave	II	45	38.6	4.6	43.2	0.41	34.2	B
Marvin St W	II	45	25.4	1.2	26.6	0.24	33.0	B
Thunder Dr	II	43	37.1	23.0	60.1	0.39	23.6	C
Olive Dr	II	45	36.5	45.0	81.5	0.39	17.2	D
	II	45	17.7	16.1	33.8	0.16	17.3	D
Oceanside Blvd	II	45	6.4	45.5	51.9	0.06	4.1	F
Aztec St	II	45	28.0	3.4	31.4	0.27	30.9	B
Avda De La Plata	II	45	18.6	2.4	21.0	0.17	29.3	B
Old Grove Rd	II	45	29.0	9.0	38.0	0.29	27.7	C
Total	II		300.1	283.2	583.3	2.90	17.9	D

Arterial Level of Service: SB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Old Grove Rd	II	45	30.9	35.5	66.4	0.31	16.9	E
Avda De La Plata	II	45	29.0	16.8	45.8	0.29	23.0	C
Aztec St	II	45	18.6	2.1	20.7	0.17	29.7	B
Oceanside Blvd	II	45	28.0	43.2	71.2	0.27	13.6	E
	II	45	6.4	14.3	20.7	0.06	10.2	F
Olive Dr	II	45	17.7	8.1	25.8	0.16	22.6	C
Thunder Dr	II	45	36.5	8.7	45.2	0.39	31.0	B
Marvin St W	II	45	37.1	16.0	53.1	0.39	26.8	C
Roselle Ave	II	45	25.4	2.4	27.8	0.24	31.6	B
Barnard Dr	II	50	35.3	21.9	57.2	0.41	25.9	C
Vista Way	II	35	19.6	44.0	63.6	0.16	8.9	F
78EB Off Ramp	II	38	12.4	9.2	21.6	0.11	18.0	D
Plaza Dr	II	35	5.7	11.5	17.2	0.05	9.5	F
Total	II		302.6	233.7	536.3	3.01	20.2	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	41	82	418	133	163	41	276	674	31	1500
v/c Ratio	0.40	0.39	0.99	0.88	0.55	0.10	0.73	0.31	0.30	0.83
Control Delay	61.8	49.0	64.0	97.9	49.5	0.5	52.9	10.2	57.5	29.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.8	49.0	64.0	97.9	49.5	0.5	52.9	10.2	57.5	29.0
Queue Length 50th (ft)	28	55	160	94	111	0	100	80	21	467
Queue Length 95th (ft)	65	95	#241	#210	167	0	#118	117	53	#719
Internal Link Dist (ft)		951			762			1473		1559
Turn Bay Length (ft)	350			260		185	350		310	
Base Capacity (vph)	109	338	424	151	384	464	377	2172	107	1799
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.24	0.99	0.88	0.42	0.09	0.73	0.31	0.29	0.83

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	30	31	51	102	91	173	949	10	1775
v/c Ratio	0.18	0.18	0.16	0.77	0.63	0.87	0.27	0.20	0.64
Control Delay	44.0	43.9	1.1	84.2	63.7	81.3	4.0	48.0	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	43.9	1.1	84.2	63.7	81.3	4.0	48.0	14.5
Queue Length 50th (ft)	21	22	0	72	56	122	75	0	154
Queue Length 95th (ft)	43	44	0	#161	#125	#244	41	m0	m391
Internal Link Dist (ft)		816			745		837		1473
Turn Bay Length (ft)						360		200	
Base Capacity (vph)	412	427	515	135	146	202	3493	51	2780
Starvation Cap Reductn	0	0	0	0	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	0.07	0.07	0.10	0.76	0.62	0.86	0.27	0.20	0.64

Intersection Summary

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.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	61	102	20	1072	20	1745
v/c Ratio	0.26	0.38	0.20	0.28	0.25	0.45
Control Delay	18.1	14.7	54.9	6.8	34.9	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	14.7	54.9	6.8	34.9	1.0
Queue Length 50th (ft)	14	14	14	30	13	1
Queue Length 95th (ft)	36	44	40	220	m20	41
Internal Link Dist (ft)	124	264		673		837
Turn Bay Length (ft)			180		180	
Base Capacity (vph)	640	660	98	3885	80	3885
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.15	0.20	0.28	0.25	0.45

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	92	367	612	388	653	153	612	857	245	112	1653	133
v/c Ratio	0.52	0.53	0.97	0.89	0.61	0.34	0.88	0.33	0.27	0.53	0.89	0.20
Control Delay	81.8	62.8	54.9	88.1	55.9	8.6	72.9	22.4	3.2	79.1	52.0	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	49.8	1.6	1.0	0.0	0.0	0.0
Total Delay	81.8	62.8	54.9	88.1	55.9	8.6	122.7	24.1	4.3	79.1	52.0	5.4
Queue Length 50th (ft)	45	124	333	193	215	0	296	171	0	54	544	0
Queue Length 95th (ft)	82	161	#507	#325	259	58	#451	245	49	96	#738	45
Internal Link Dist (ft)		2087			1290			253			574	
Turn Bay Length (ft)	295		205	290		200	320		355	420		300
Base Capacity (vph)	183	1185	633	434	1557	580	708	2617	918	228	1862	659
Starvation Cap Reductn	0	0	0	0	0	0	181	1522	449	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.31	0.97	0.89	0.42	0.26	1.16	0.78	0.52	0.49	0.89	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	30	10	194	929	10	1082	827	1693
v/c Ratio	0.11	0.03	0.79	0.68	0.20	0.79	0.84	0.68
Control Delay	35.6	0.1	63.6	20.2	61.0	36.0	45.3	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	35.6	0.1	63.6	20.2	61.0	36.0	45.3	12.6
Queue Length 50th (ft)	18	0	131	212	7	370	268	304
Queue Length 95th (ft)	42	0	203	273	26	#501	#371	556
Internal Link Dist (ft)	594		161			822		767
Turn Bay Length (ft)		90			190		450	
Base Capacity (vph)	344	467	314	1374	51	1363	1011	2490
Starvation Cap Reductn	0	0	0	0	0	0	0	212
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.02	0.62	0.68	0.20	0.79	0.82	0.74

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1: College Blvd & Old Grove Rd

3/31/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	255	173	469	92	102	51	429	1419	51	990
v/c Ratio	0.86	0.51	0.78	0.61	0.55	0.15	0.79	0.76	0.49	0.69
Control Delay	79.0	52.7	28.9	73.6	65.8	1.0	41.1	9.0	75.1	35.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.0	52.7	28.9	73.6	65.8	1.0	41.1	9.0	75.1	35.5
Queue Length 50th (ft)	207	132	196	76	84	0	169	292	42	360
Queue Length 95th (ft)	#335	195	256	133	135	0	#223	110	#100	486
Internal Link Dist (ft)		953			764			1465		1567
Turn Bay Length (ft)	350			260		185	350		310	
Base Capacity (vph)	325	437	601	182	286	406	541	1862	107	1433
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.40	0.78	0.51	0.36	0.13	0.79	0.76	0.48	0.69

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	95	99	173	82	41	112	1897	20	1419
v/c Ratio	0.51	0.51	0.53	0.56	0.26	0.61	0.59	0.27	0.51
Control Delay	61.8	61.4	12.7	71.1	48.0	60.1	2.4	57.0	16.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.8	61.4	12.7	71.1	48.0	60.1	2.4	57.0	16.8
Queue Length 50th (ft)	82	85	0	67	25	100	36	18	166
Queue Length 95th (ft)	126	130	61	121	61	166	18	m24	321
Internal Link Dist (ft)		816			745		821		1465
Turn Bay Length (ft)						360		200	
Base Capacity (vph)	354	369	463	182	193	223	3217	78	2770
Starvation Cap Reductn	0	0	0	0	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	0.27	0.27	0.37	0.45	0.21	0.50	0.59	0.26	0.51

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	51	71	41	2000	31	1561
v/c Ratio	0.26	0.33	0.40	0.49	0.39	0.40
Control Delay	25.1	21.3	82.2	3.4	51.4	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.1	21.3	82.2	3.4	51.4	2.1
Queue Length 50th (ft)	16	16	37	13	23	16
Queue Length 95th (ft)	42	47	m39	m547	m51	86
Internal Link Dist (ft)	124	191		699		821
Turn Bay Length (ft)			180		180	
Base Capacity (vph)	541	545	106	4078	81	3950
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.13	0.39	0.49	0.38	0.40

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	347	857	745	367	714	255	520	1520	286	327	1173	153
v/c Ratio	1.01	0.71	0.99	0.93	0.55	0.45	0.79	0.86	0.41	0.85	0.88	0.30
Control Delay	109.1	48.7	52.4	87.0	43.6	8.2	59.6	45.5	8.0	61.3	43.2	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	16.0	48.1	1.1	0.0	0.0	0.0
Total Delay	109.1	48.7	52.4	87.0	43.6	8.2	75.6	93.6	9.1	61.3	43.2	9.2
Queue Length 50th (ft)	~155	239	315	160	188	8	217	441	23	130	381	23
Queue Length 95th (ft)	#257	287	#686	#254	231	77	281	506	93	#224	#456	102
Internal Link Dist (ft)		2087			1290			229			565	
Turn Bay Length (ft)	295		205	290		200	320		355	420		300
Base Capacity (vph)	343	1290	749	396	1369	589	660	1773	698	386	1329	512
Starvation Cap Reductn	0	0	0	0	0	0	134	665	217	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.66	0.99	0.93	0.52	0.43	0.99	1.37	0.59	0.85	0.88	0.30

Intersection Summary

~ 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.

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	10	92	847	20	1837	929	1357
v/c Ratio	0.10	0.04	0.56	0.85	0.23	0.97	1.20	0.50
Control Delay	48.8	0.2	65.6	41.5	66.2	45.0	144.4	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.8	0.2	65.6	41.5	66.2	45.0	144.4	8.1
Queue Length 50th (ft)	15	0	75	336	16	738	~488	148
Queue Length 95th (ft)	37	0	122	361	45	#1092	#619	390
Internal Link Dist (ft)	594		225			812		776
Turn Bay Length (ft)		90			190		450	
Base Capacity (vph)	321	398	273	999	86	1886	776	2702
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.03	0.34	0.85	0.23	0.97	1.20	0.50

Intersection Summary

~ 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.

APPENDIX D: QUEUING REPORTS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	41	82	388	143	184	41	265	684	31	1510
v/c Ratio	0.40	0.38	0.93	0.89	0.59	0.10	0.77	0.32	0.30	0.84
Control Delay	61.8	48.4	52.9	96.4	49.9	0.5	57.9	11.3	57.5	29.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.8	48.4	52.9	96.4	49.9	0.5	57.9	11.3	57.5	29.2
Queue Length 50th (ft)	28	54	139	102	125	0	96	84	21	475
Queue Length 95th (ft)	65	95	206	#220	186	0	#142	124	53	#722
Internal Link Dist (ft)		951			762			1473		1559
Turn Bay Length (ft)	350			260		185	350		310	
Base Capacity (vph)	109	338	415	161	394	472	346	2138	107	1803
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.24	0.93	0.89	0.47	0.09	0.77	0.32	0.29	0.84

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	30	31	41	102	81	163	949	10	1775
v/c Ratio	0.18	0.18	0.13	0.77	0.55	0.84	0.27	0.20	0.63
Control Delay	44.0	43.9	0.9	84.2	56.6	77.3	4.0	49.0	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	43.9	0.9	84.2	56.6	77.3	4.0	49.0	14.1
Queue Length 50th (ft)	21	22	0	72	48	114	75	0	154
Queue Length 95th (ft)	43	44	0	#161	#100	#230	42	m0	m399
Internal Link Dist (ft)		816			745		837		1473
Turn Bay Length (ft)						360		200	
Base Capacity (vph)	412	427	515	135	148	199	3493	51	2797
Starvation Cap Reductn	0	0	0	0	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	0.07	0.07	0.08	0.76	0.55	0.82	0.27	0.20	0.63

Intersection Summary

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.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	61	102	20	1061	20	1745
v/c Ratio	0.26	0.38	0.20	0.27	0.25	0.45
Control Delay	18.1	14.7	54.9	6.8	34.5	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	14.7	54.9	6.8	34.5	1.0
Queue Length 50th (ft)	14	14	14	30	13	1
Queue Length 95th (ft)	36	44	40	218	m20	39
Internal Link Dist (ft)	124	264		673		837
Turn Bay Length (ft)			180		200	
Base Capacity (vph)	640	660	98	3885	80	3885
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.15	0.20	0.27	0.25	0.45

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	92	367	561	378	663	143	541	857	255	112	1673	112
v/c Ratio	0.51	0.52	0.94	0.86	0.61	0.32	0.86	0.33	0.28	0.53	0.86	0.16
Control Delay	80.9	62.0	48.1	83.8	55.3	8.6	73.9	22.6	3.3	78.4	48.3	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	32.3	1.6	1.0	0.0	0.0	0.0
Total Delay	80.9	62.0	48.1	83.8	55.3	8.6	106.2	24.2	4.3	78.4	48.3	2.9
Queue Length 50th (ft)	45	123	292	186	217	0	260	171	0	54	535	0
Queue Length 95th (ft)	82	159	412	#310	261	56	#398	245	51	96	#697	25
Internal Link Dist (ft)		2087			1290			253			574	
Turn Bay Length (ft)	295		205	290		200	320		355	420		300
Base Capacity (vph)	185	1231	608	438	1608	587	646	2607	920	230	1950	683
Starvation Cap Reductn	0	0	0	0	0	0	131	1504	440	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.30	0.92	0.86	0.41	0.24	1.05	0.78	0.53	0.49	0.86	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	30	10	204	918	10	1021	827	1653
v/c Ratio	0.11	0.02	0.80	0.67	0.20	0.76	0.84	0.67
Control Delay	35.2	0.1	64.7	19.4	61.0	34.9	45.4	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	35.2	0.1	64.7	19.4	61.0	34.9	45.4	12.5
Queue Length 50th (ft)	17	0	137	203	7	345	268	299
Queue Length 95th (ft)	42	0	213	267	26	434	#364	531
Internal Link Dist (ft)	594		161			822		767
Turn Bay Length (ft)		90			190		450	
Base Capacity (vph)	341	467	314	1389	51	1344	1012	2471
Starvation Cap Reductn	0	0	0	0	0	0	0	208
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.02	0.65	0.66	0.20	0.76	0.82	0.73

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	245	163	459	102	102	51	408	1460	51	1010
v/c Ratio	0.86	0.52	0.79	0.63	0.55	0.15	0.77	0.78	0.49	0.69
Control Delay	79.5	54.3	29.4	73.4	65.8	1.0	40.2	9.3	75.1	34.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.5	54.3	29.4	73.4	65.8	1.0	40.2	9.3	75.1	34.8
Queue Length 50th (ft)	199	125	188	84	84	0	160	62	42	365
Queue Length 95th (ft)	#323	190	250	142	135	0	208	153	#100	492
Internal Link Dist (ft)		953			764			1465		1567
Turn Bay Length (ft)	350			260		185	350		310	
Base Capacity (vph)	314	402	584	204	286	406	530	1882	107	1463
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.41	0.79	0.50	0.36	0.13	0.77	0.78	0.48	0.69

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	95	98	153	92	41	112	1908	20	1439
v/c Ratio	0.51	0.50	0.50	0.60	0.25	0.61	0.60	0.27	0.52
Control Delay	61.8	61.4	12.6	72.6	47.3	61.5	3.1	58.5	16.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.8	61.4	12.6	72.6	47.3	61.5	3.1	58.5	16.1
Queue Length 50th (ft)	82	84	0	75	25	101	35	18	176
Queue Length 95th (ft)	126	130	58	133	61	166	15	m25	308
Internal Link Dist (ft)		816			745		821		1465
Turn Bay Length (ft)						360		200	
Base Capacity (vph)	354	367	447	185	196	223	3199	78	2752
Starvation Cap Reductn	0	0	0	0	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	0.27	0.27	0.34	0.50	0.21	0.50	0.60	0.26	0.52

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	51	71	41	2010	31	1571
v/c Ratio	0.26	0.33	0.40	0.49	0.39	0.40
Control Delay	25.1	21.3	82.2	3.9	51.1	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.1	21.3	82.2	3.9	51.1	2.0
Queue Length 50th (ft)	16	16	37	13	25	15
Queue Length 95th (ft)	42	47	m39	m546	m50	86
Internal Link Dist (ft)	124	191		699		821
Turn Bay Length (ft)			180		200	
Base Capacity (vph)	541	545	106	4078	81	3950
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.13	0.39	0.49	0.38	0.40

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	367	847	653	388	694	245	439	1520	296	316	1194	153
v/c Ratio	0.99	0.70	0.90	0.92	0.54	0.44	0.72	0.86	0.42	0.85	0.87	0.29
Control Delay	103.2	48.6	34.8	84.0	43.4	8.9	58.2	45.9	7.4	63.9	40.5	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	3.4	48.0	1.1	0.0	0.0	0.0
Total Delay	103.2	48.6	34.8	84.0	43.4	8.9	61.6	93.9	8.4	63.9	40.5	8.4
Queue Length 50th (ft)	161	236	249	169	183	13	181	441	19	128	386	23
Queue Length 95th (ft)	#266	284	#429	#263	224	81	241	506	89	#224	#458	100
Internal Link Dist (ft)		2087			1290			229			565	
Turn Bay Length (ft)	295		205	290		200	320		355	420		300
Base Capacity (vph)	369	1290	726	422	1369	577	607	1763	708	370	1372	524
Starvation Cap Reductn	0	0	0	0	0	0	93	665	215	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.66	0.90	0.92	0.51	0.42	0.85	1.38	0.60	0.85	0.87	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	10	102	827	20	1786	939	1296
v/c Ratio	0.10	0.03	0.60	0.80	0.23	0.97	1.17	0.48
Control Delay	48.1	0.2	67.3	37.3	66.2	45.3	133.7	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	0.2	67.3	37.3	66.2	45.3	133.7	8.1
Queue Length 50th (ft)	15	0	83	315	16	724	~485	145
Queue Length 95th (ft)	37	0	132	343	45	#1059	#615	363
Internal Link Dist (ft)	594		225			812		776
Turn Bay Length (ft)		90			190		450	
Base Capacity (vph)	321	398	272	1033	86	1840	802	2686
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.03	0.38	0.80	0.23	0.97	1.17	0.48

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

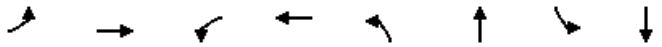
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	61	31	92	357	51	1469	255	1122
v/c Ratio	0.40	0.12	0.59	0.79	0.49	0.69	0.84	0.44
Control Delay	59.3	1.0	69.2	52.4	74.1	21.2	74.9	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.3	1.0	69.2	52.4	74.1	21.2	74.9	8.5
Queue Length 50th (ft)	49	0	75	263	42	421	210	184
Queue Length 95th (ft)	89	0	128	325	86	632	297	285
Internal Link Dist (ft)	584		892			753		1080
Turn Bay Length (ft)		60		100	230		230	
Base Capacity (vph)	232	336	232	518	130	2131	377	2572
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.09	0.40	0.69	0.39	0.69	0.68	0.44

Intersection Summary

Lane Group	EBL	NBL	NBT	SBT
Lane Group Flow (vph)	142	184	1510	1123
v/c Ratio	0.60	0.55	0.55	0.58
Control Delay	41.3	35.0	1.2	18.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	41.3	35.0	1.2	18.6
Queue Length 50th (ft)	68	133	4	252
Queue Length 95th (ft)	120	188	26	395
Internal Link Dist (ft)	702		460	53
Turn Bay Length (ft)		250		
Base Capacity (vph)	393	334	2762	1936
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	0.55	0.55	0.58

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	71	41	61	92	1715	41	1082
v/c Ratio	0.15	0.34	0.31	0.30	0.54	0.63	0.42	0.43
Control Delay	44.0	21.2	49.4	22.6	76.8	5.4	44.3	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	21.2	49.4	22.6	76.8	5.4	44.3	1.4
Queue Length 50th (ft)	13	13	28	13	70	165	28	11
Queue Length 95th (ft)	33	50	55	47	m82	105	m52	39
Internal Link Dist (ft)		834		664		2090		669
Turn Bay Length (ft)	50		70		190		160	
Base Capacity (vph)	281	390	279	382	205	2723	101	2528
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.18	0.15	0.16	0.45	0.63	0.41	0.43

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	194	418	153	204	418	1745	82	1061
v/c Ratio	0.65	0.70	0.77	0.86	0.79	0.74	0.55	0.57
Control Delay	52.0	19.6	72.7	66.7	37.0	10.1	52.9	16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.0	19.6	72.7	66.7	37.0	10.1	52.9	16.5
Queue Length 50th (ft)	130	118	106	105	157	79	48	222
Queue Length 95th (ft)	190	162	#202	#230	#216	308	#125	234
Internal Link Dist (ft)	726			454		748		2090
Turn Bay Length (ft)			275		400		130	
Base Capacity (vph)	425	693	209	247	530	2363	154	1874
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.60	0.73	0.83	0.79	0.74	0.53	0.57

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	102	143	398	520	316	357	296	1704	694	41	1489
v/c Ratio	0.24	0.35	0.77	0.82	0.50	0.80	0.76	0.71	0.32	0.26	0.80
Control Delay	47.0	46.3	20.0	54.4	42.2	30.6	53.2	28.6	3.1	42.8	24.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.0	46.3	20.0	54.4	42.2	30.6	53.2	28.7	3.1	42.8	24.7
Queue Length 50th (ft)	32	48	64	180	108	105	108	372	54	15	382
Queue Length 95th (ft)	#70	79	131	#260	133	191	#164	419	113	m25	326
Internal Link Dist (ft)		564			246			124			748
Turn Bay Length (ft)	170		200	290		200	100		120	165	
Base Capacity (vph)	420	505	558	653	987	583	397	2415	2123	156	1866
Starvation Cap Reductn	0	0	0	0	0	0	0	46	0	0	0
Spillback Cap Reductn	0	0	0	0	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	0.24	0.28	0.71	0.80	0.32	0.61	0.75	0.72	0.33	0.26	0.80

Intersection Summary

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.

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	704	367	1990	2010
v/c Ratio	0.72	0.82	0.51	0.44
Control Delay	39.5	50.5	5.5	9.0
Queue Delay	0.0	4.0	0.7	0.0
Total Delay	39.5	54.5	6.3	9.1
Queue Length 50th (ft)	229	238	97	113
Queue Length 95th (ft)	258	311	m104	151
Internal Link Dist (ft)	513		160	286
Turn Bay Length (ft)				
Base Capacity (vph)	1416	655	3900	4592
Starvation Cap Reductn	0	0	1426	0
Spillback Cap Reductn	0	205	0	478
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.50	0.82	0.80	0.49

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	184	92	204	20	531	31	1276	327	857	1521
v/c Ratio	0.78	0.42	0.53	0.06	0.71	0.38	1.06	0.66	0.98	0.62
Control Delay	68.1	37.5	46.0	35.5	15.7	64.3	83.5	24.4	61.8	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.4	0.1
Total Delay	68.1	37.5	46.0	35.5	15.7	64.3	83.5	24.4	99.3	10.4
Queue Length 50th (ft)	124	48	122	12	121	22	~363	96	~351	91
Queue Length 95th (ft)	#231	82	#313	32	194	54	#457	198	#481	116
Internal Link Dist (ft)		552		614			980			160
Turn Bay Length (ft)	95		135			125		120		
Base Capacity (vph)	253	462	384	406	811	82	1206	497	872	2436
Starvation Cap Reductn	0	0	0	0	0	0	0	0	91	167
Spillback Cap Reductn	0	0	0	0	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	0.20	0.53	0.05	0.65	0.38	1.06	0.66	1.10	0.67

Intersection Summary

~ 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.

Lane Group	NBT	SBT
Lane Group Flow (vph)	2547	2305
v/c Ratio	0.60	0.54
Control Delay	15.5	14.0
Queue Delay	20.2	47.6
Total Delay	35.7	61.5
Queue Length 50th (ft)	1152	943
Queue Length 95th (ft)	1087	902
Internal Link Dist (ft)	776	229
Turn Bay Length (ft)		
Base Capacity (vph)	4234	4288
Starvation Cap Reductn	1771	2215
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	1.03	1.11

Intersection Summary

APPENDIX E: PEAK HOUR ROADWAY SEGMENT LOS WORKSHEETS

Arterial Level of Service: NB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Plaza Dr	II	35	25.3	29.2	54.5	0.20	13.4	E
78EB Off Ramp	II	35	6.3	4.6	10.9	0.05	16.6	E
Vista Way	II	41	12.2	9.2	21.4	0.11	17.8	D
Waring Rd	II	35	20.0	11.8	31.8	0.16	18.1	D
Roselle Ave	II	50	35.6	3.3	38.9	0.41	38.3	A
Marvin St W	II	45	23.7	10.9	34.6	0.23	23.7	C
Thunder Dr	II	43	38.5	20.1	58.6	0.41	25.1	C
Olive Dr	II	45	35.9	33.0	68.9	0.38	20.0	D
	II	45	17.5	13.2	30.7	0.16	18.8	D
Oceanside Blvd	II	45	6.9	53.1	60.0	0.06	3.8	F
Avda De La Plata	II	45	40.1	13.2	53.3	0.44	29.7	B
Old Grove Rd	II	45	29.1	6.6	35.7	0.29	29.7	B
Total	II		291.1	208.2	499.3	2.91	21.0	D

Arterial Level of Service: SB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Old Grove Rd	II	45	30.7	36.0	66.7	0.31	16.8	E
Avda De La Plata	II	45	29.1	13.4	42.5	0.29	24.9	C
Oceanside Blvd	II	45	40.1	55.7	95.8	0.44	16.5	E
	II	45	6.9	20.4	27.3	0.06	8.3	F
Olive Dr	II	45	17.5	9.4	26.9	0.16	21.5	D
Thunder Dr	II	45	35.9	5.5	41.4	0.38	33.2	B
Marvin St W	II	45	38.5	9.9	48.4	0.41	30.4	B
Roselle Ave	II	40	25.1	13.1	38.2	0.23	21.5	D
Barnard Dr	II	50	35.6	34.9	70.5	0.41	21.1	D
Vista Way	II	35	20.0	29.7	49.7	0.16	11.6	F
78EB Off Ramp	II	38	12.2	8.0	20.2	0.11	18.9	D
Plaza Dr	II	35	6.3	6.2	12.5	0.05	14.5	E
Total	II		297.9	242.2	540.1	3.02	20.1	D

Arterial Level of Service: NB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Plaza Dr	II	35	25.1	42.1	67.2	0.20	10.8	F
78EB Off Ramp	II	35	5.7	3.6	9.3	0.05	17.6	D
Vista Way	II	41	12.4	10.4	22.8	0.11	17.0	D
Waring Rd	II	35	19.6	18.6	38.2	0.16	14.8	E
Roselle Ave	II	45	38.6	7.6	46.2	0.41	32.0	B
Marvin St W	II	45	25.4	1.6	27.0	0.24	32.6	B
Thunder Dr	II	43	37.1	19.7	56.8	0.39	25.0	C
Olive Dr	II	45	36.5	28.2	64.7	0.39	21.6	D
	II	45	17.7	18.0	35.7	0.16	16.3	E
Oceanside Blvd	II	45	6.4	52.2	58.6	0.06	3.6	F
Avda De La Plata	II	45	40.1	10.4	50.5	0.44	31.4	B
Old Grove Rd	II	45	29.0	9.0	38.0	0.29	27.7	C
Total	II		293.6	221.4	515.0	2.90	20.3	D

Arterial Level of Service: SB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Old Grove Rd	II	45	30.9	27.8	58.7	0.31	19.1	D
Avda De La Plata	II	45	29.0	10.6	39.6	0.29	26.6	C
Oceanside Blvd	II	45	40.1	46.1	86.2	0.44	18.4	D
	II	45	6.4	16.5	22.9	0.06	9.2	F
Olive Dr	II	45	17.7	6.0	23.7	0.16	24.6	C
Thunder Dr	II	45	36.5	7.3	43.8	0.39	31.9	B
Marvin St W	II	45	37.1	10.6	47.7	0.39	29.8	B
Roselle Ave	II	45	25.4	12.0	37.4	0.24	23.5	C
Barnard Dr	II	50	35.3	36.8	72.1	0.41	20.5	D
Vista Way	II	35	19.6	101.5	121.1	0.16	4.7	F
78EB Off Ramp	II	38	12.4	11.7	24.1	0.11	16.1	E
Plaza Dr	II	35	5.7	9.9	15.6	0.05	10.5	F
Total	II		296.1	296.8	592.9	3.01	18.3	D

Arterial Level of Service: NB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Plaza Dr	II	35	25.3	29.0	54.3	0.20	13.4	E
78EB Off Ramp	II	35	6.3	3.3	9.6	0.05	18.8	D
Vista Way	II	41	12.2	22.0	34.2	0.11	11.2	F
Waring Rd	II	35	20.0	9.3	29.3	0.16	19.7	D
Roselle Ave	II	50	35.6	2.1	37.7	0.41	39.5	A
Marvin St W	II	45	24.7	1.9	26.6	0.24	32.2	B
Thunder Dr	II	43	37.7	19.8	57.5	0.40	25.1	C
Olive Dr	II	45	35.9	30.1	66.0	0.38	20.8	D
	II	45	17.5	10.7	28.2	0.16	20.5	D
Oceanside Blvd	II	45	6.9	26.9	33.8	0.06	6.7	F
Aztec St	II	45	27.7	6.4	34.1	0.27	28.1	B
Avda De La Plata	II	45	18.9	5.6	24.5	0.17	25.5	C
Old Grove Rd	II	45	29.1	23.1	52.2	0.29	20.3	D
Total	II		297.8	190.2	488.0	2.91	21.5	D

Arterial Level of Service: SB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Old Grove Rd	II	45	30.7	28.1	58.8	0.31	19.0	D
Avda De La Plata	II	45	29.1	7.7	36.8	0.29	28.8	B
Aztec St	II	45	18.9	0.6	19.5	0.17	32.1	B
Oceanside Blvd	II	45	27.7	48.4	76.1	0.27	12.6	F
	II	45	6.9	13.5	20.4	0.06	11.1	F
Olive Dr	II	45	17.5	9.9	27.4	0.16	21.1	D
Thunder Dr	II	45	35.9	5.1	41.0	0.38	33.6	B
Marvin St W	II	45	37.7	9.3	47.0	0.40	30.7	B
Roselle Ave	II	40	26.2	3.9	30.1	0.24	28.5	B
Barnard Dr	II	50	35.6	19.3	54.9	0.41	27.1	C
Vista Way	II	35	20.0	18.7	38.7	0.16	14.9	E
78EB Off Ramp	II	38	12.2	6.5	18.7	0.11	20.4	D
Plaza Dr	II	35	6.3	6.8	13.1	0.05	13.8	E
Total	II		304.7	177.8	482.5	3.02	22.5	C

Arterial Level of Service: NB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Plaza Dr	II	35	25.1	48.8	73.9	0.20	9.8	F
78EB Off Ramp	II	35	5.7	8.0	13.7	0.05	11.9	F
Vista Way	II	41	12.4	31.4	43.8	0.11	8.9	F
Waring Rd	II	35	19.6	9.5	29.1	0.16	19.4	D
Roselle Ave	II	45	38.6	4.7	43.3	0.41	34.2	B
Marvin St W	II	45	25.4	2.1	27.5	0.24	32.0	B
Thunder Dr	II	43	37.1	20.7	57.8	0.39	24.6	C
Olive Dr	II	45	36.5	28.5	65.0	0.39	21.5	D
	II	45	17.7	12.3	30.0	0.16	19.5	D
Oceanside Blvd	II	45	6.4	40.5	46.9	0.06	4.5	F
Aztec St	II	45	28.0	4.9	32.9	0.27	29.5	B
Avda De La Plata	II	45	18.6	2.6	21.2	0.17	29.0	B
Old Grove Rd	II	45	29.0	7.9	36.9	0.29	28.5	B
Total	II		300.1	221.9	522.0	2.90	20.0	D

Arterial Level of Service: SB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Old Grove Rd	II	45	30.9	23.6	54.5	0.31	20.6	D
Avda De La Plata	II	45	29.0	11.9	40.9	0.29	25.8	C
Aztec St	II	45	18.6	1.8	20.4	0.17	30.1	B
Oceanside Blvd	II	45	28.0	30.4	58.4	0.27	16.6	E
	II	45	6.4	11.8	18.2	0.06	11.6	F
Olive Dr	II	45	17.7	6.2	23.9	0.16	24.4	C
Thunder Dr	II	45	36.5	6.8	43.3	0.39	32.3	B
Marvin St W	II	45	37.1	12.9	50.0	0.39	28.4	B
Roselle Ave	II	45	25.4	2.1	27.5	0.24	32.0	B
Barnard Dr	II	50	35.3	18.7	54.0	0.41	27.4	C
Vista Way	II	35	19.6	27.9	47.5	0.16	11.9	F
78EB Off Ramp	II	38	12.4	7.4	19.8	0.11	19.6	D
Plaza Dr	II	35	5.7	9.5	15.2	0.05	10.8	F
Total	II		302.6	171.0	473.6	3.01	22.9	C

Arterial Level of Service: NB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Plaza Dr	II	35	25.3	34.6	59.9	0.20	12.2	F
78EB Off Ramp	II	35	6.3	4.4	10.7	0.05	16.9	E
Vista Way	II	41	12.2	16.0	28.2	0.11	13.5	E
Waring Rd	II	35	20.0	12.0	32.0	0.16	18.0	D
	II	50	35.6	1.0	36.6	0.41	40.7	A
Marvin St W	II	45	24.6	2.1	26.7	0.24	31.9	B
Thunder Dr	II	43	37.7	18.2	55.9	0.40	25.8	C
	II	45	35.9	34.9	70.8	0.38	19.4	D
	II	45	17.5	16.9	34.4	0.16	16.8	E
	II	45	6.9	27.3	34.2	0.06	6.6	F
Avda De La Plata	II	45	40.1	7.7	47.8	0.44	33.1	B
Old Grove Rd	II	45	29.1	10.5	39.6	0.29	26.7	C
Total	II		291.2	185.6	476.8	2.91	22.0	D

Arterial Level of Service: SB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Old Grove Rd	II	45	30.7	29.2	59.9	0.31	18.7	D
Avda De La Plata	II	45	29.1	10.3	39.4	0.29	26.9	C
Oceanside Blvd	II	45	40.1	106.1	146.2	0.44	10.8	F
	II	45	6.9	33.5	40.4	0.06	5.6	F
Olive Dr	II	45	17.5	12.3	29.8	0.16	19.4	D
Thunder Dr	II	45	35.9	7.2	43.1	0.38	31.9	B
Marvin St W	II	45	37.7	14.7	52.4	0.40	27.6	C
Roselle Ave	II	40	26.1	3.3	29.4	0.24	29.0	B
Barnard Dr	II	50	35.6	76.4	112.0	0.41	13.3	E
Vista Way	II	35	20.0	13.7	33.7	0.16	17.1	D
78EB Off Ramp	II	38	12.2	6.3	18.5	0.11	20.6	D
Plaza Dr	II	35	6.3	3.8	10.1	0.05	17.9	D
Total	II		298.1	316.8	614.9	3.02	17.7	D

Arterial Level of Service: NB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Plaza Dr	II	35	25.1	101.8	126.9	0.20	5.7	F
78EB Off Ramp	II	35	5.7	6.2	11.9	0.05	13.8	E
Vista Way	II	41	12.4	24.0	36.4	0.11	10.7	F
Waring Rd	II	35	19.6	24.8	44.4	0.16	12.7	F
	II	45	38.6	3.3	41.9	0.41	35.3	A
Marvin St W	II	45	25.4	1.1	26.5	0.24	33.2	B
Thunder Dr	II	43	37.1	21.2	58.3	0.39	24.4	C
	II	45	36.5	45.3	81.8	0.39	17.1	D
	II	45	17.7	28.4	46.1	0.16	12.7	F
Oceanside Blvd	II	45	6.4	92.2	98.6	0.06	2.1	F
	II	45	40.1	3.8	43.9	0.44	36.1	A
	II	45	29.0	11.4	40.4	0.29	26.1	C
Total	II		293.6	363.5	657.1	2.90	15.9	E

Arterial Level of Service: SB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Old Grove Rd	II	45	30.9	34.8	65.7	0.31	17.1	D
Avda De La Plata	II	45	29.0	13.1	42.1	0.29	25.0	C
Oceanside Blvd	II	45	40.1	48.8	88.9	0.44	17.8	D
	II	45	6.4	21.9	28.3	0.06	7.4	F
Olive Dr	II	45	17.7	8.1	25.8	0.16	22.6	C
Thunder Dr	II	45	36.5	8.5	45.0	0.39	31.1	B
Marvin St W	II	45	37.1	18.6	55.7	0.39	25.5	C
Roselle Ave	II	45	25.4	1.5	26.9	0.24	32.7	B
Barnard Dr	II	50	35.3	18.4	53.7	0.41	27.6	C
Vista Way	II	35	19.6	29.4	49.0	0.16	11.5	F
78EB Off Ramp	II	38	12.4	4.3	16.7	0.11	23.3	C
Plaza Dr	II	35	5.7	15.7	21.4	0.05	7.6	F
Total	II		296.1	223.1	519.2	3.01	20.9	D

Arterial Level of Service: NB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Plaza Dr	II	35	25.3	26.0	51.3	0.20	14.2	E
78EB Off Ramp	II	35	6.3	6.9	13.2	0.05	13.7	E
Vista Way	II	41	12.2	10.4	22.6	0.11	16.9	E
Waring Rd	II	35	20.0	11.9	31.9	0.16	18.1	D
Roselle Ave	II	50	35.6	1.8	37.4	0.41	39.9	A
Marvin St W	II	45	24.7	2.0	26.7	0.24	32.1	B
Thunder Dr	II	43	37.7	19.1	56.8	0.40	25.4	C
Olive Dr	II	45	35.9	31.5	67.4	0.38	20.4	D
	II	45	17.5	12.3	29.8	0.16	19.4	D
Oceanside Blvd	II	45	6.9	25.8	32.7	0.06	6.9	F
Aztec St	II	45	27.7	6.8	34.5	0.27	27.8	C
Avda De La Plata	II	45	18.9	4.1	23.0	0.17	27.2	C
Old Grove Rd	II	45	29.1	8.6	37.7	0.29	28.1	B
Total	II		297.8	167.2	465.0	2.91	22.5	C

Arterial Level of Service: SB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Old Grove Rd	II	45	30.7	28.5	59.2	0.31	18.9	D
Avda De La Plata	II	45	29.1	14.8	43.9	0.29	24.1	C
Aztec St	II	45	18.9	1.0	19.9	0.17	31.4	B
Oceanside Blvd	II	45	27.7	52.2	79.9	0.27	12.0	F
	II	45	6.9	17.2	24.1	0.06	9.4	F
Olive Dr	II	45	17.5	11.3	28.8	0.16	20.1	D
Thunder Dr	II	45	35.9	9.0	44.9	0.38	30.6	B
Marvin St W	II	45	37.7	12.1	49.8	0.40	29.0	B
Roselle Ave	II	40	26.2	2.9	29.1	0.24	29.4	B
Barnard Dr	II	50	35.6	24.4	60.0	0.41	24.8	C
Vista Way	II	35	20.0	10.1	30.1	0.16	19.2	D
78EB Off Ramp	II	38	12.2	5.4	17.6	0.11	21.7	D
Plaza Dr	II	35	6.3	8.5	14.8	0.05	12.2	F
Total	II		304.7	197.4	502.1	3.02	21.7	D

Arterial Level of Service: NB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Plaza Dr	II	35	25.1	85.8	110.9	0.20	6.5	F
78EB Off Ramp	II	35	5.7	5.7	11.4	0.05	14.4	E
Vista Way	II	41	12.4	25.4	37.8	0.11	10.3	F
Waring Rd	II	35	19.6	19.5	39.1	0.16	14.4	E
Roselle Ave	II	45	38.6	3.2	41.8	0.41	35.4	A
Marvin St W	II	45	25.4	1.1	26.5	0.24	33.2	B
Thunder Dr	II	43	37.1	20.1	57.2	0.39	24.8	C
Olive Dr	II	45	36.5	32.0	68.5	0.39	20.4	D
	II	45	17.7	16.1	33.8	0.16	17.3	D
Oceanside Blvd	II	45	6.4	55.2	61.6	0.06	3.4	F
Aztec St	II	45	28.0	4.2	32.2	0.27	30.2	B
Avda De La Plata	II	45	18.6	2.3	20.9	0.17	29.4	B
Old Grove Rd	II	45	29.0	7.4	36.4	0.29	28.9	B
Total	II		300.1	278.0	578.1	2.90	18.1	D

Arterial Level of Service: SB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Old Grove Rd	II	45	30.9	36.1	67.0	0.31	16.8	E
Avda De La Plata	II	45	29.0	14.8	43.8	0.29	24.1	C
Aztec St	II	45	18.6	1.3	19.9	0.17	30.9	B
Oceanside Blvd	II	45	28.0	40.5	68.5	0.27	14.2	E
	II	45	6.4	14.9	21.3	0.06	9.9	F
Olive Dr	II	45	17.7	7.7	25.4	0.16	23.0	C
Thunder Dr	II	45	36.5	7.8	44.3	0.39	31.6	B
Marvin St W	II	45	37.1	16.4	53.5	0.39	26.6	C
Roselle Ave	II	45	25.4	1.8	27.2	0.24	32.3	B
Barnard Dr	II	50	35.3	20.1	55.4	0.41	26.7	C
Vista Way	II	35	19.6	22.2	41.8	0.16	13.5	E
78EB Off Ramp	II	38	12.4	10.5	22.9	0.11	17.0	E
Plaza Dr	II	35	5.7	10.9	16.6	0.05	9.9	F
Total	II		302.6	205.0	507.6	3.01	21.4	D

Arterial Level of Service: NB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Plaza Dr	II	35	25.3	30.8	56.1	0.20	13.0	F
78EB Off Ramp	II	35	6.3	3.9	10.2	0.05	17.7	D
Vista Way	II	41	12.2	18.9	31.1	0.11	12.3	F
Waring Rd	II	35	20.0	7.8	27.8	0.16	20.7	D
Roselle Ave	II	50	35.6	2.0	37.6	0.41	39.6	A
Marvin St W	II	45	24.7	3.7	28.4	0.24	30.2	B
Thunder Dr	II	43	37.7	18.2	55.9	0.40	25.8	C
Olive Dr	II	45	35.9	34.9	70.8	0.38	19.4	D
	II	45	17.5	12.2	29.7	0.16	19.4	D
Oceanside Blvd	II	45	6.9	22.6	29.5	0.06	7.7	F
Aztec St	II	45	27.7	6.8	34.5	0.27	27.8	C
Avda De La Plata	II	45	18.9	4.0	22.9	0.17	27.3	C
Old Grove Rd	II	45	29.1	11.3	40.4	0.29	26.2	C
Total	II		297.8	177.1	474.9	2.91	22.1	C

Arterial Level of Service: SB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Old Grove Rd	II	45	30.7	29.2	59.9	0.31	18.7	D
Avda De La Plata	II	45	29.1	14.1	43.2	0.29	24.5	C
Aztec St	II	45	18.9	1.0	19.9	0.17	31.4	B
Oceanside Blvd	II	45	27.7	48.3	76.0	0.27	12.6	F
	II	45	6.9	16.5	23.4	0.06	9.7	F
Olive Dr	II	45	17.5	12.3	29.8	0.16	19.4	D
Thunder Dr	II	45	35.9	7.2	43.1	0.38	31.9	B
Marvin St W	II	45	37.7	14.7	52.4	0.40	27.6	C
Roselle Ave	II	40	26.2	3.6	29.8	0.24	28.7	B
Barnard Dr	II	50	35.6	21.9	57.5	0.41	25.9	C
Vista Way	II	35	20.0	13.3	33.3	0.16	17.3	D
78EB Off Ramp	II	38	12.2	6.2	18.4	0.11	20.8	D
Plaza Dr	II	35	6.3	6.0	12.3	0.05	14.7	E
Total	II		304.7	194.3	499.0	3.02	21.8	D

Arterial Level of Service: NB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Plaza Dr	II	35	25.1	83.5	108.6	0.20	6.7	F
78EB Off Ramp	II	35	5.7	5.5	11.2	0.05	14.6	E
Vista Way	II	41	12.4	28.6	41.0	0.11	9.5	F
Waring Rd	II	35	19.6	10.1	29.7	0.16	19.0	D
Roselle Ave	II	45	38.6	5.4	44.0	0.41	33.6	B
Marvin St W	II	45	25.4	1.2	26.6	0.24	33.0	B
Thunder Dr	II	43	37.1	21.2	58.3	0.39	24.4	C
Olive Dr	II	45	36.5	45.3	81.8	0.39	17.1	D
	II	45	17.7	15.5	33.2	0.16	17.6	D
Oceanside Blvd	II	45	6.4	45.9	52.3	0.06	4.0	F
Aztec St	II	45	28.0	3.9	31.9	0.27	30.4	B
Avda De La Plata	II	45	18.6	3.1	21.7	0.17	28.3	B
Old Grove Rd	II	45	29.0	9.3	38.3	0.29	27.5	C
Total	II		300.1	278.5	578.6	2.90	18.1	D

Arterial Level of Service: SB College Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Old Grove Rd	II	45	30.9	34.8	65.7	0.31	17.1	D
Avda De La Plata	II	45	29.0	16.1	45.1	0.29	23.4	C
Aztec St	II	45	18.6	2.0	20.6	0.17	29.8	B
Oceanside Blvd	II	45	28.0	40.5	68.5	0.27	14.2	E
	II	45	6.4	14.0	20.4	0.06	10.3	F
Olive Dr	II	45	17.7	8.1	25.8	0.16	22.6	C
Thunder Dr	II	45	36.5	8.5	45.0	0.39	31.1	B
Marvin St W	II	45	37.1	18.6	55.7	0.39	25.5	C
Roselle Ave	II	45	25.4	1.4	26.8	0.24	32.8	B
Barnard Dr	II	50	35.3	16.5	51.8	0.41	28.6	B
Vista Way	II	35	19.6	24.7	44.3	0.16	12.7	F
78EB Off Ramp	II	38	12.4	9.0	21.4	0.11	18.2	D
Plaza Dr	II	35	5.7	10.3	16.0	0.05	10.2	F
Total	II		302.6	204.5	507.1	3.01	21.4	D

APPENDIX F: LOS+ WORKSHEETS

LOS+ Worksheets – Existing (2014) Conditions

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street College Boulevard | Direction Northbound | Date 3/18/2015

Limits Plaza Drive to West Marvin Street | Scenario Existing AM | Analyst CM, SA

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Plaza Dr	SR 78 EB Off Ramp	0.76	2.34	B	6959.99	3.36	C	1.63	A	#DIV/0!	N/A
2	SR 78 EB Off Ramp	Vista Way	0.61	4.04	D	5842.28	3.88	D	1.96	A	#DIV/0!	N/A
3	Vista Way	Waring Rd	0.59	3.29	C	7199.99	3.71	D	2.11	B	5.77	F
4	Waring Rd	Roselle Ave	0.80	2.14	B	50400.00	4.50	E	2.84	C	#DIV/0!	N/A
5	Roselle Ave	West Marvin St	0.79	2.14	B	45504.00	3.07	C	3.77	D	#DIV/0!	N/A

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street College Boulevard Direction Northbound Date 3/18/2015

Limits Plaza Drive to West Marvin Street Scenario Existing PM Analyst CM

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Plaza Dr	SR 78 EB Off Ramp	0.89	5.84	F	4175.99	3.65	D	1.71	A	#DIV/0!	N/A
2	SR 78 EB Off Ramp	Vista Way	0.71	4.04	D	2921.13	4.10	D	2.01	B	#DIV/0!	N/A
3	Vista Way	Waring Rd	0.84	3.29	C	10080.00	3.96	D	2.18	B	5.82	F
4	Waring Rd	Roselle Ave	0.85	2.14	B	25200.00	4.67	E	2.84	C	#DIV/0!	N/A
5	Roselle Ave	West Marvin St	0.75	2.14	B	7775.99	3.29	C	4.44	E	#DIV/0!	N/A

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM, SA**

Limits: **Plaza Drive to West Marvin Street**

Scenario: **Existing AM**

Analysis Direction	NB

(Down Direction on this Sheet)

Users Must Input Data In Light Green Shaded Areas

Plaza Dr

Segment #1

Pedestrian Walking Speed (ft/s)	Pedestrian Flow Rate (ped/hr)
4.0	6

Segment Volume Data	
Vehicle Flow Rate (vph)	3,203
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	0.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	212
Speed Limit (mph)	35
Left Turn Pocket?	No
Avg. Travel Time (s)	10
Avg. Stops (#/veh)	0

SR 78 EB Off Ramp

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	64%

Segment #2

Pedestrian Flow Rate (ped/hr)
7

Segment Volume Data	
Vehicle Flow Rate (vph)	4,046
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	53.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	504
Speed Limit (mph)	35
Left Turn Pocket?	Yes
Avg. Travel Time (s)	23
Avg. Stops (#/veh)	1

Vista Way

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	47%

Segment #3

Pedestrian Flow Rate (ped/hr)
7

Segment Volume Data	
Vehicle Flow Rate (vph)	2,708
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	46.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	789
Speed Limit (mph)	35
Left Turn Pocket?	Yes
Avg. Travel Time (s)	29
Avg. Stops (#/veh)	1

Waring Rd

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	50%

Segment #4

Pedestrian Flow Rate (ped/hr)
1

Segment Volume Data	
Vehicle Flow Rate (vph)	2,106
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	7.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	2,175
Speed Limit (mph)	50
Left Turn Pocket?	Yes
Avg. Travel Time (s)	39
Avg. Stops (#/veh)	0

Roselle Ave

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	78%

Segment #5

Pedestrian Flow Rate (ped/hr)
1

Segment Volume Data	
Vehicle Flow Rate (vph)	2,060
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	4.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	1,000
Speed Limit (mph)	25
Left Turn Pocket?	Yes
Avg. Travel Time (s)	36
Avg. Stops (#/veh)	0

West Marvin St

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	76%

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

Street: College Boulevard | Limits: Plaza Drive to West Marvin Street

Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM, SA | Date: 3/18/2015

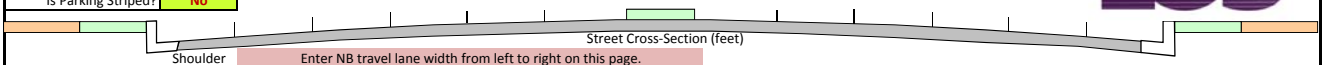
From: Plaza Dr | To: SR 78 EB Off Ramp

1

Fixed Object Width (ft)	Parking Occupancy %
0.0	0%
Is Curb Present?	Yes
Is Parking Striped?	No

Median Type (0-3)	2
Pavement Condition	4.0

NB | SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	5.0	12.0	12.0	11.0	10.0	4.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.60	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #2

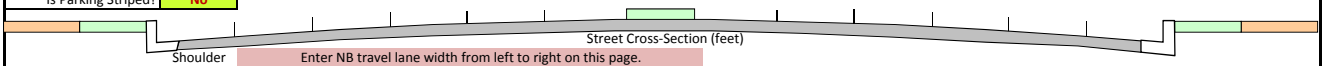
From: SR 78 EB Off Ramp | To: Vista Way

2

Fixed Object Width (ft)	Parking Occupancy %
0.0	0%
Is Curb Present?	Yes
Is Parking Striped?	No

Median Type (0-3)	3
Pavement Condition	4.0

NB | SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	5.0	11.0	12.0	11.0	10.0	10.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.66	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #3

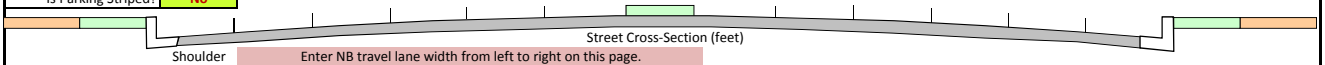
From: Vista Way | To: Waring Rd

3

Fixed Object Width (ft)	Parking Occupancy %
0.0	0%
Is Curb Present?	Yes
Is Parking Striped?	No

Median Type (0-3)	3
Pavement Condition	4.0

NB | SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	5.0	10.0	11.0	10.0		4.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #4

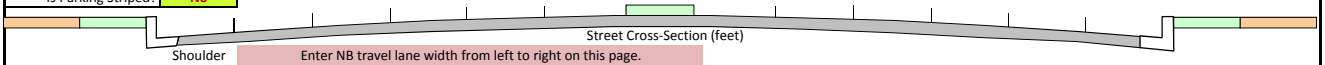
From: Waring Rd | To: Roselle Ave

4

Fixed Object Width (ft)	Parking Occupancy %
0.0	0%
Is Curb Present?	Yes
Is Parking Striped?	No

Median Type (0-3)	3
Pavement Condition	4.0

NB | SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	5.0	10.0	10.0			20.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #5

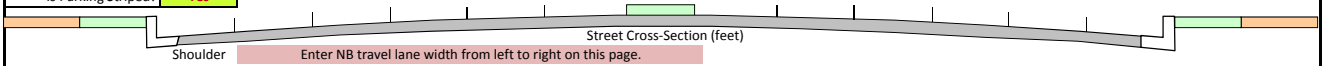
From: Roselle Ave | To: West Marvin St

5

Fixed Object Width (ft)	Parking Occupancy %
0.0	85%
Is Curb Present?	Yes
Is Parking Striped?	Yes

Median Type (0-3)	3
Pavement Condition	4.0

NB | SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	7.5	5.0	10.0	12.0			18.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.34	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM**

Limits: **Plaza Drive to West Marvin Street**

Scenario: **Existing PM**

Analysis Direction	NB

(Down Direction on this Sheet)

Users Must Input Data In Light Green Shaded Areas

Plaza Dr

Segment #1

Pedestrian Walking Speed (ft/s)	Pedestrian Flow Rate (ped/hr)
4.0	10

Segment Volume Data	
Vehicle Flow Rate (vph)	3,735
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	0.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	212
Speed Limit (mph)	35
Left Turn Pocket?	Yes
Avg. Travel Time (s)	11
Avg. Stops (#/veh)	1

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	61%

SR 78 EB Off Ramp

Segment #2

Pedestrian Flow Rate (ped/hr)
14

Segment Volume Data	
Vehicle Flow Rate (vph)	4,435
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	41.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	504
Speed Limit (mph)	35
Left Turn Pocket?	Yes
Avg. Travel Time (s)	23
Avg. Stops (#/veh)	1

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	53%

Vista Way

Segment #3

Pedestrian Flow Rate (ped/hr)
5

Segment Volume Data	
Vehicle Flow Rate (vph)	3,112
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	30.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	789
Speed Limit (mph)	35
Left Turn Pocket?	Yes
Avg. Travel Time (s)	37
Avg. Stops (#/veh)	1

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	50%

Waring Rd

Segment #4

Pedestrian Flow Rate (ped/hr)
2

Segment Volume Data	
Vehicle Flow Rate (vph)	2,358
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	9.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	2,175
Speed Limit (mph)	50
Left Turn Pocket?	Yes
Avg. Travel Time (s)	43
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	77%

Roselle Ave

Segment #5

Pedestrian Flow Rate (ped/hr)
4

Segment Volume Data	
Vehicle Flow Rate (vph)	2,233
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	8.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	1,000
Speed Limit (mph)	25
Left Turn Pocket?	Yes
Avg. Travel Time (s)	26
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	79%

West Marvin St

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

Street: College Boulevard | Limits: Plaza Drive to West Marvin Street

Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM | Date: 3/18/2015

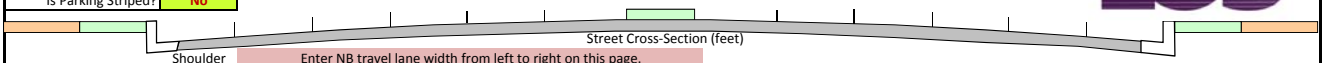
From: Plaza Dr | To: SR 78 EB Off Ramp

1

Fixed Object Width (ft)	Parking Occupancy %
0.0	0%
Is Curb Present?	Yes
Is Parking Striped?	No

Median Type (0-3)	2
Pavement Condition	4.0

NB | SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	5.0	12.0	12.0	11.0	10.0	4.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.60	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #2

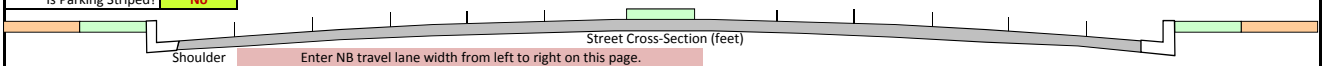
From: SR 78 EB Off Ramp | To: Vista Way

2

Fixed Object Width (ft)	Parking Occupancy %
0.0	0%
Is Curb Present?	Yes
Is Parking Striped?	No

Median Type (0-3)	3
Pavement Condition	4.0

NB | SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	5.0	11.0	12.0	11.0	10.0	10.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.66	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #3

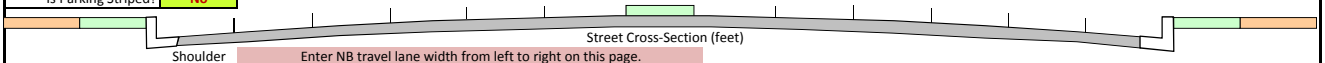
From: Vista Way | To: Waring Rd

3

Fixed Object Width (ft)	Parking Occupancy %
0.0	0%
Is Curb Present?	Yes
Is Parking Striped?	No

Median Type (0-3)	3
Pavement Condition	4.0

NB | SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	5.0	10.0	11.0	10.0		4.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #4

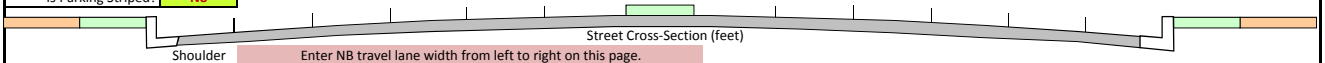
From: Waring Rd | To: Roselle Ave

4

Fixed Object Width (ft)	Parking Occupancy %
0.0	0%
Is Curb Present?	Yes
Is Parking Striped?	No

Median Type (0-3)	3
Pavement Condition	4.0

NB | SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	5.0	10.0	10.0			20.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #5

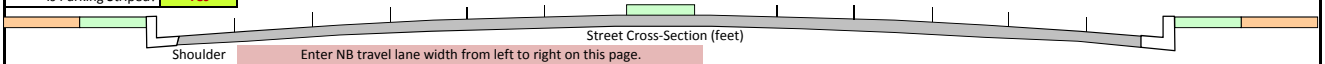
From: Roselle Ave | To: West Marvin St

5

Fixed Object Width (ft)	Parking Occupancy %
1.0	100%
Is Curb Present?	Yes
Is Parking Striped?	Yes

Median Type (0-3)	3
Pavement Condition	4.0

NB | SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	7.5	5.0	10.0	12.0			18.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.34	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street: College Boulevard | Direction: Northbound | Date: 3/18/2015

Limits: West Marvin Street to Aztec Street | Scenario: Existing AM | Analyst: CM, SA

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	West Marvin St	East Marvin St	0.62	2.34	B	22320.00	3.02	C	3.77	D	#DIV/0!	N/A
2	East Marvin St	Thunder Dr	1.14	2.14	F (v/c>1)	24192.00	2.85	C	3.99	D	#DIV/0!	N/A
3	Thunder Dr	Olive Dr	1.77	2.14	F (v/c>1)	16800.00	4.45	E	2.25	B	#DIV/0!	N/A
4	Olive Dr	Oceanside Blvd	1.81	2.88	F (v/c>1)	25200.00	5.45	F	2.58	B	#DIV/0!	N/A
5	Oceanside Blvd	Aztec St	0.74	2.14	B	16800.00	4.57	E	2.55	B	#DIV/0!	N/A

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street College Boulevard | Direction Northbound | Date 3/18/2015

Limits West Marvin Street to Aztec Street | Scenario Existing PM | Analyst CM, SA

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	West Marvin St	East Marvin St	0.64	2.34	B	22320.00	3.11	C	4.03	D	#DIV/0!	N/A
2	East Marvin St	Thunder Dr	1.00	2.14	B	48384.00	2.90	C	4.20	D	#DIV/0!	N/A
3	Thunder Dr	Olive Dr	1.37	2.52	F (v/c>1)	16800.00	4.64	E	2.34	B	#DIV/0!	N/A
4	Olive Dr	Oceanside Blvd	1.74	2.88	F (v/c>1)	7199.99	5.62	F	2.59	B	#DIV/0!	N/A
5	Oceanside Blvd	Aztec St	0.89	2.14	B	5599.99	5.23	F	2.64	B	#DIV/0!	N/A

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM, SA**

Limits: **West Marvin Street to Aztec Street**

Scenario: **Existing AM**

Analysis Direction	NB

(Down Direction on this Sheet)

Users Must Input Data In Light Green Shaded Areas

West Marvin St

Segment #1

Pedestrian Walking Speed (ft/s)	Pedestrian Flow Rate (ped/hr)
4.0	2

Segment Volume Data	
Vehicle Flow Rate (vph)	2,047
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	5.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	298
Speed Limit (mph)	45
Left Turn Pocket?	No
Avg. Travel Time (s)	10
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
SSSC	0%

East Marvin St

Segment #2

Pedestrian Flow Rate (ped/hr)
2

Segment Volume Data	
Vehicle Flow Rate (vph)	2,054
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	3.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	1,758
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	53
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	56%

Thunder Dr

Segment #3

Pedestrian Flow Rate (ped/hr)
3

Segment Volume Data	
Vehicle Flow Rate (vph)	2,433
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	9.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	2,160
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	66
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	40%

Olive Dr

Segment #4

Pedestrian Flow Rate (ped/hr)
2

Segment Volume Data	
Vehicle Flow Rate (vph)	3,457
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	48.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	1,171
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	92
Avg. Stops (#/veh)	1

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	30%

Oceanside Blvd

Segment #5

Pedestrian Flow Rate (ped/hr)
3

Segment Volume Data	
Vehicle Flow Rate (vph)	2,410
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	4.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	1,327
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	31
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
SSSC	0%

Aztec St

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

Street: College Boulevard | Limits: West Marvin Street to Aztec Street

Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM, SA | Date: 3/18/2015

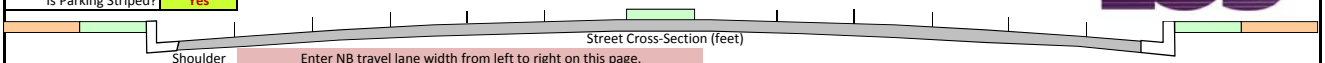
From: West Marvin St To: East Marvin St

1

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
1.0	85%	Yes	Yes

Median Type (0-3): 3
Pavement Condition: 4.0

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	4.0	7.5	5.0	10.0	10.0			17.0

0.10	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.10	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.40	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #2

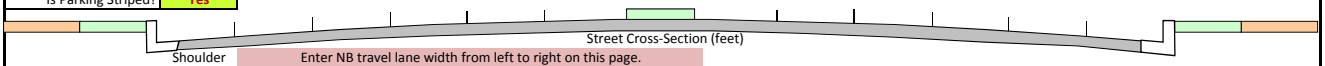
From: East Marvin St To: Thunder Dr

2

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
1.0	85%	Yes	Yes

Median Type (0-3): 3
Pavement Condition: 4.0

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	4.0	7.5	5.0	10.0	11.0			17.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.64	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
Yes	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #3

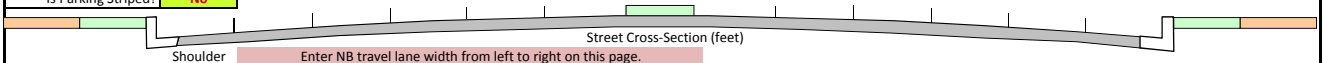
From: Thunder Dr To: Olive Dr

3

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
0.0	0%	Yes	No

Median Type (0-3): 3
Pavement Condition: 4.0

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	5.0	11.0	11.0			21.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #4

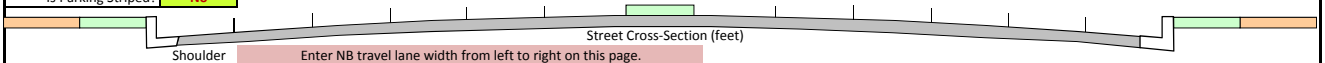
From: Olive Dr To: Oceanside Blvd

4

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
0.0	0%	Yes	No

Median Type (0-3): 3
Pavement Condition: 3.0

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	5.0	11.0	11.0			20.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #5

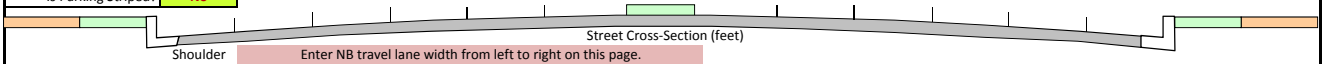
From: Oceanside Blvd To: Aztec St

5

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
0.0	0%	Yes	No

Median Type (0-3): 3
Pavement Condition: 4.0

NB r SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	5.0	11.0	11.0			20.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM, SA**

Limits: **West Marvin Street to Aztec Street**

Scenario: **Existing PM**

Analysis Direction	NB

(Down Direction on this Sheet)

Users Must Input Data In Light Green Shaded Areas

West Marvin St

Segment #1

Pedestrian Walking Speed (ft/s)	Pedestrian Flow Rate (ped/hr)
4.0	2

Segment Volume Data	
Vehicle Flow Rate (vph)	2,209
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	5.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	298
Speed Limit (mph)	45
Left Turn Pocket?	No
Avg. Travel Time (s)	10
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
SSSC	0%

East Marvin St

Segment #2

Pedestrian Flow Rate (ped/hr)
1

Segment Volume Data	
Vehicle Flow Rate (vph)	2,175
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	7.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	1,758
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	54
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	62%

Thunder Dr

Segment #3

Pedestrian Flow Rate (ped/hr)
3

Segment Volume Data	
Vehicle Flow Rate (vph)	2,583
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	10.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	2,160
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	64
Avg. Stops (#/veh)	1

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	52%

Olive Dr

Segment #4

Pedestrian Flow Rate (ped/hr)
7

Segment Volume Data	
Vehicle Flow Rate (vph)	3,550
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	34.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	1,171
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	52
Avg. Stops (#/veh)	1

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	39%

Oceanside Blvd

Segment #5

Pedestrian Flow Rate (ped/hr)
9

Segment Volume Data	
Vehicle Flow Rate (vph)	3,009
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	4.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	1,327
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	32
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
SSSC	0%

Aztec St

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

Street: College Boulevard | Limits: West Marvin Street to Aztec Street

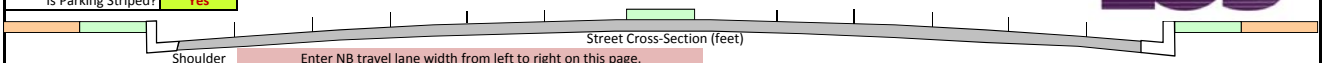
Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM, SA | Date: 3/18/2015

From: West Marvin St To: East Marvin St

1									
Fixed Object Width (ft)	Parking Occupancy %								
1.0	100%								
Is Curb Present?	Yes								
Is Parking Striped?	Yes								

Median Type (0-3): 3
Pavement Condition: 4.0

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	4.0	7.5	5.0	10.0	10.0			17.0

0.10	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.10	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.40	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

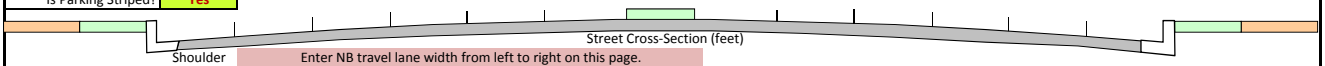
Segment #2

From: East Marvin St To: Thunder Dr

2									
Fixed Object Width (ft)	Parking Occupancy %								
1.0	100%								
Is Curb Present?	Yes								
Is Parking Striped?	Yes								

Median Type (0-3): 3
Pavement Condition: 4.0

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	4.0	7.5	5.0	10.0	11.0			17.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.64	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
Yes	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

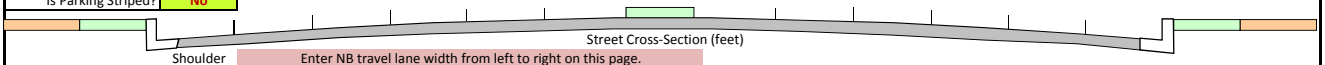
Segment #3

From: Thunder Dr To: Olive Dr

3									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 4.0

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	5.0	11.0	11.0			21.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

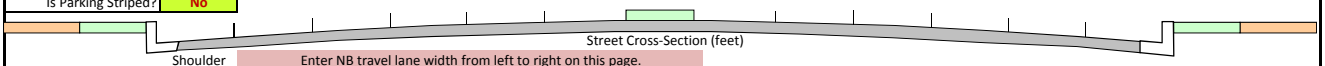
Segment #4

From: Olive Dr To: Oceanside Blvd

4									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 3.0

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	5.0	11.0	11.0			20.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

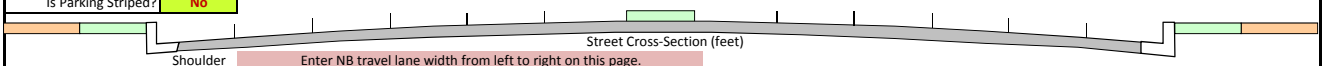
Segment #5

From: Oceanside Blvd To: Aztec St

5									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 4.0

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	5.0	11.0	11.0			20.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street College Boulevard Direction Northbound Date 3/18/2015

Limits Aztec Street to Old Grove Rd Scenario Existing AM Analyst CM, SA

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Aztec Street	Avenida De La Plata	0.85	2.14	B	25200.00	4.66	E	2.80	C	#DIV/0!	N/A
2	Avenida De La Plata	Old Grove Rd	0.84	2.14	B	28800.00	4.23	D	2.54	B	#DIV/0!	N/A
3												
4												
5												

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street College Boulevard | Direction Northbound | Date 3/18/2015

Limits Aztec Street to Old Grove Rd | Scenario Existing PM | Analyst CM, SA

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Aztec Street	Avenida De La Plata	1.09	2.14	F (v/c>1)	5599.99	5.31	F	2.91	C	#DIV/0!	N/A
2	Avenida De La Plata	Old Grove Rd	1.09	2.14	F (v/c>1)	28800.00	4.67	E	2.55	B	#DIV/0!	N/A
3												
4												
5												

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM, SA**

Limits: **Aztec Street to Old Grove Rd**

Scenario: **Existing AM**

Analysis Direction	NB

(Down Direction on this Sheet)

Users Must Input Data In Light Green Shaded Areas

Aztec Street

Segment #1

Pedestrian Walking Speed (ft/s)	Pedestrian Flow Rate (ped/hr)
4.0	2

Segment Volume Data	
Vehicle Flow Rate (vph)	2,421
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	21.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	919
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	20
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	68%

Avenida De La Plata

Segment #2

Pedestrian Flow Rate (ped/hr)
2

Segment Volume Data	
Vehicle Flow Rate (vph)	2,278
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	27.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	1,565
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	35
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	63%

Old Grove Rd

Segment #3

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

Segment #4

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

Segment #5

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

Street: College Boulevard | Limits: Aztec Street to Old Grove Rd

Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM, SA | Date: 3/18/2015

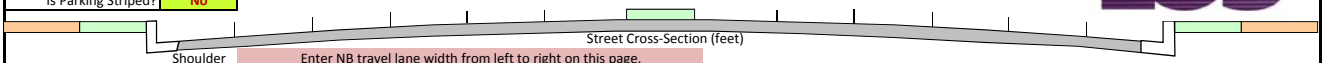
From: Aztec Street To: Avenida De La Plata

1

Fixed Object Width (ft)	Parking Occupancy %
0.0	0%
Is Curb Present?	Yes
Is Parking Striped?	No

Median Type (0-3)	3
Pavement Condition	4.0

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	5.0	10.0	11.0			20.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #2

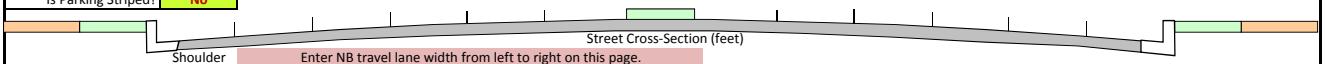
From: Avenida De La Plata To: Old Grove Rd

2

Fixed Object Width (ft)	Parking Occupancy %
1.0	0%
Is Curb Present?	Yes
Is Parking Striped?	No

Median Type (0-3)	3
Pavement Condition	4.0

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	8.0	0.0	5.0	11.0	11.0			20.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #3

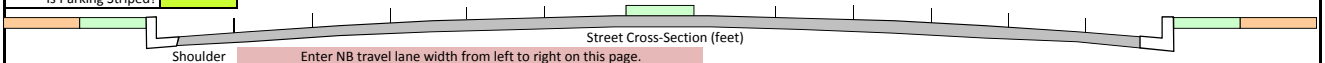
From: To:

3

Fixed Object Width (ft)	Parking Occupancy %
Is Curb Present?	
Is Parking Striped?	

Median Type (0-3)	
Pavement Condition	

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #4

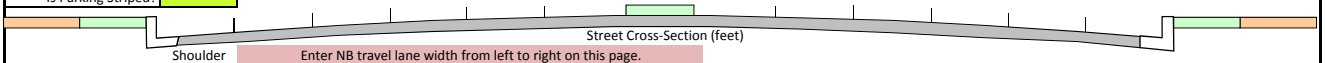
From: To:

4

Fixed Object Width (ft)	Parking Occupancy %
Is Curb Present?	
Is Parking Striped?	

Median Type (0-3)	
Pavement Condition	

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #5

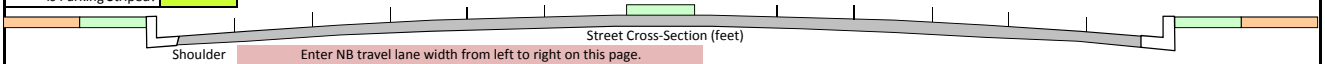
From: To:

5

Fixed Object Width (ft)	Parking Occupancy %
Is Curb Present?	
Is Parking Striped?	

Median Type (0-3)	
Pavement Condition	

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM, SA**

Limits: **Aztec Street to Old Grove Rd**

Scenario: **Existing PM**

Analysis Direction	NB

(Down Direction on this Sheet)

Aztec Street

Users Must Input Data In Light Green Shaded Areas

Segment #1

Pedestrian Walking Speed (ft/s)
4.0

Pedestrian Flow Rate (ped/hr)
9

Segment Volume Data	
Vehicle Flow Rate (vph)	2,992
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	14.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	919
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	20
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	68%

Avenida De La Plata

Segment #2

Pedestrian Flow Rate (ped/hr)
2

Segment Volume Data	
Vehicle Flow Rate (vph)	2,728
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	23.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	1,565
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	39
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	59%

Old Grove Rd

Segment #3

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

Segment #4

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

Segment #5

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

Street: College Boulevard | Limits: Aztec Street to Old Grove Rd

Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM, SA | Date: 3/18/2015

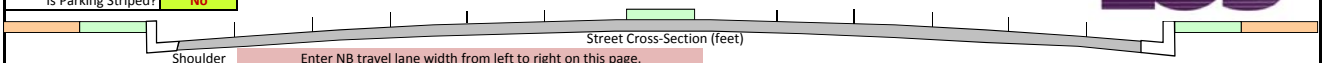
From: Aztec Street To: Avenida De La Plata

1

Fixed Object Width (ft)	Parking Occupancy %
0.0	0%
Is Curb Present?	Yes
Is Parking Striped?	No

Median Type (0-3)	3
Pavement Condition	4.0

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	5.0	10.0	11.0			20.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #2

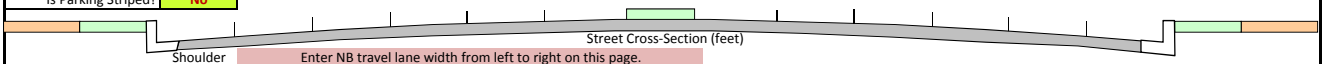
From: Avenida De La Plata To: Old Grove Rd

2

Fixed Object Width (ft)	Parking Occupancy %
1.0	0%
Is Curb Present?	Yes
Is Parking Striped?	No

Median Type (0-3)	3
Pavement Condition	4.0

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	8.0	0.0	5.0	11.0	11.0			20.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #3

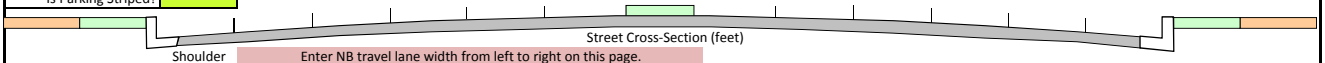
From: To:

3

Fixed Object Width (ft)	Parking Occupancy %
Is Curb Present?	
Is Parking Striped?	

Median Type (0-3)	
Pavement Condition	

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #4

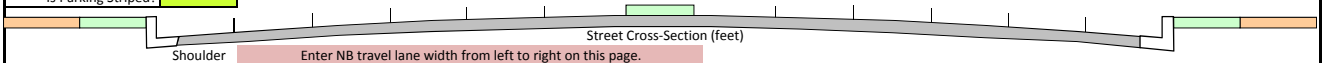
From: To:

4

Fixed Object Width (ft)	Parking Occupancy %
Is Curb Present?	
Is Parking Striped?	

Median Type (0-3)	
Pavement Condition	

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #5

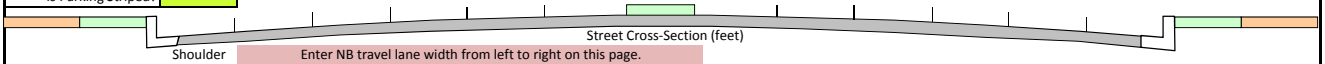
From: To:

5

Fixed Object Width (ft)	Parking Occupancy %
Is Curb Present?	
Is Parking Striped?	

Median Type (0-3)	
Pavement Condition	

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street College Boulevard | Direction Southbound | Date 3/18/2015

Limits Old Grove Road to Thunder Drive | Scenario Existing AM | Analyst CM, SA

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Old Grove Rd	Avenida De La Plata	1.19	2.14	F (v/c>1)	19200.00	3.22	C	1.95	A	5.63	F
2	Avenida De La Plata	Aztec St	0.77	2.14	B	50400.00	4.55	E	2.12	B	#DIV/0!	N/A
3	Aztec St	Oceanside Blvd	1.58	2.75	F (v/c>1)	8399.99	4.22	D	1.60	A	#DIV/0!	N/A
4	Oceanside Blvd	Olive Dr	1.06	2.92	F (v/c>1)	16800.00	5.36	F	2.13	B	5.23	F
5	Olive Dr	Thunder Dr	0.79	2.14	B	10080.00	4.73	E	2.21	B	#DIV/0!	N/A

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street College Boulevard | Direction Southbound | Date 3/18/2015

Limits Old Grove Road to Thunder Drive | Scenario Existing PM | Analyst SA, CM

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Old Grove Rd	Avenida De La Plata	1.22	2.14	F (v/c>1)	57600.00	3.73	D	2.04	B	5.71	F
2	Avenida De La Plata	Aztec St	0.90	2.14	B	12600.00	5.20	F	2.23	B	#DIV/0!	N/A
3	Aztec St	Oceanside Blvd	1.89	2.75	F (v/c>1)	8399.99	4.96	E	1.73	A	#DIV/0!	N/A
4	Oceanside Blvd	Olive Dr	0.85	2.92	C	2964.69	5.62	F	2.16	B	5.25	F
5	Olive Dr	Thunder Dr	0.80	2.14	B	10080.00	4.88	E	2.23	B	#DIV/0!	N/A

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM, SA**

Limits: **Old Grove Road to Thunder Drive**

Scenario: **Existing AM**

Analysis Direction	SB

(Down Direction on this Sheet)

Users Must Input Data In Light Green Shaded Areas

Old Grove Rd

Segment #1

Pedestrian Walking Speed (ft/s)	Pedestrian Flow Rate (ped/hr)
4.0	3

Segment Volume Data	
Vehicle Flow Rate (vph)	2,278
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	10.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	1,547
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	42
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	52%

Avenida De La Plata

Segment #2

Pedestrian Flow Rate (ped/hr)
1

Segment Volume Data	
Vehicle Flow Rate (vph)	2,421
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	1.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	868
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	20
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
SSSC	0%

Aztec St

Segment #3

Pedestrian Flow Rate (ped/hr)
6

Segment Volume Data	
Vehicle Flow Rate (vph)	2,371
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	14.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	1,400
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	70
Avg. Stops (#/veh)	1

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	39%

Oceanside Blvd

Segment #4

Pedestrian Flow Rate (ped/hr)
3

Segment Volume Data	
Vehicle Flow Rate (vph)	3,378
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	29.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	1,106
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	55
Avg. Stops (#/veh)	1

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	72%

Olive Dr

Segment #5

Pedestrian Flow Rate (ped/hr)
5

Segment Volume Data	
Vehicle Flow Rate (vph)	2,493
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	20.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	2,087
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	43
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	81%

Thunder Dr

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

Street: College Boulevard | Limits: Old Grove Road to Thunder Drive

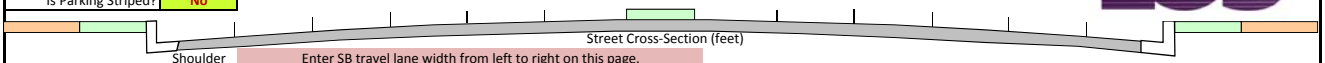
Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM, SA | Date: 3/18/2015

From: Old Grove Rd To: Avenida De La Plata

1									
Fixed Object Width (ft)	Parking Occupancy %								
1.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 4.0

SB NB



Shoulder: Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	11.0	0.0	6.0	11.0	11.0			16.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
Yes	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

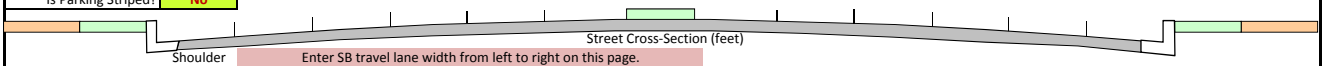
Segment #2

From: Avenida De La Plata To: Aztec St

2									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 4.0

SB NB



Shoulder: Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	6.0	11.0	11.0			20.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

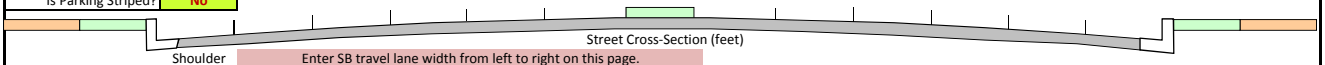
Segment #3

From: Aztec St To: Oceanside Blvd

3									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 4.0

SB NB



Shoulder: Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	6.0	11.0	11.0			20.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

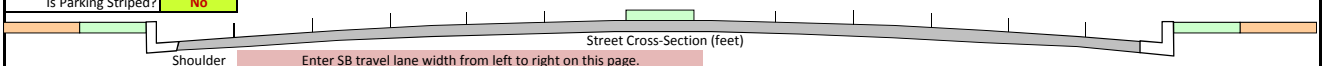
Segment #4

From: Oceanside Blvd To: Olive Dr

4									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 3.0

SB NB



Shoulder: Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	6.0	11.0	11.0			20.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

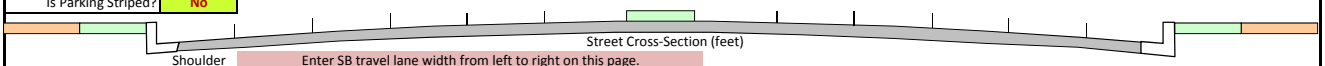
Segment #5

From: Olive Dr To: Thunder Dr

5									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 4.0

SB NB



Shoulder: Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	6.0	11.0	11.0			20.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **SA, CM**

Limits: **Old Grove Road to Thunder Drive**

Scenario: **Existing PM**

Analysis Direction	SB

(Down Direction on this Sheet)

Users Must Input Data In Light Green Shaded Areas

Old Grove Rd

Segment #1

Pedestrian Walking Speed (ft/s)	Pedestrian Flow Rate (ped/hr)
4.0	1

Segment Volume Data	
Vehicle Flow Rate (vph)	2,728
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	7.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	1,547
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	42
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	60%

Avenida De La Plata

Segment #2

Pedestrian Flow Rate (ped/hr)
4

Segment Volume Data	
Vehicle Flow Rate (vph)	2,992
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	2.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	868
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	20
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
SSSC	0%

Aztec St

Segment #3

Pedestrian Flow Rate (ped/hr)
6

Segment Volume Data	
Vehicle Flow Rate (vph)	3,015
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	33.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	1,400
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	65
Avg. Stops (#/veh)	1

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	31%

Oceanside Blvd

Segment #4

Pedestrian Flow Rate (ped/hr)
17

Segment Volume Data	
Vehicle Flow Rate (vph)	3,576
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	39.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	1,106
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	46
Avg. Stops (#/veh)	1

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	79%

Olive Dr

Segment #5

Pedestrian Flow Rate (ped/hr)
5

Segment Volume Data	
Vehicle Flow Rate (vph)	2,641
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	24.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	2,087
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	44
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	77%

Thunder Dr

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

Street: College Boulevard | Limits: Old Grove Road to Thunder Drive

Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: SA, CM | Date: 3/18/2015

From: Old Grove Rd To: Avenida De La Plata

1									
Fixed Object Width (ft)	Parking Occupancy %								
1.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 4.0

SB | NB

Street Cross-Section (feet)

Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	11.0	0.0	6.0	11.0	11.0			16.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
Yes	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #2

From: Avenida De La Plata To: Aztec St

2									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 4.0

SB | NB

Street Cross-Section (feet)

Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	6.0	11.0	11.0			20.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #3

From: Aztec St To: Oceanside Blvd

3									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 4.0

SB | NB

Street Cross-Section (feet)

Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	6.0	11.0	11.0			20.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #4

From: Oceanside Blvd To: Olive Dr

4									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 3.0

SB | NB

Street Cross-Section (feet)

Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	6.0	11.0	11.0			20.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #5

From: Olive Dr To: Thunder Dr

5									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 4.0

SB | NB

Street Cross-Section (feet)

Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	6.0	11.0	11.0			20.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street College Boulevard | Direction Southbound | Date 3/18/2015

Limits Thunder Drive to Vista Way | Scenario Existing AM | Analyst CM, SA

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Thunder Dr	East Marvin St	0.61	2.14	B	47088.00	3.19	C	4.23	D	#DIV/0!	N/A
2	East Marvin St	West Marvin St	0.89	2.34	B	21600.00	2.97	C	3.77	D	#DIV/0!	N/A
3	West Marvin St	Roselle Ave	0.86	2.14	B	26280.00	3.08	C	3.83	D	#DIV/0!	N/A
4	Roselle Ave	Waring Rd	1.47	2.14	F (v/c>1)	16800.00	3.99	D	1.98	A	#DIV/0!	N/A
5	Waring Rd	Vista Way	1.62	3.19	F (v/c>1)	28800.00	3.48	C	2.11	B	4.59	E

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street College Boulevard | Direction Southbound | Date 3/18/2015

Limits Thunder Drive to Vista Way | Scenario Existing PM | Analyst CM, SA

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Thunder Dr	East Marvin St	0.62	2.14	B	23544.00	3.16	C	4.35	E	#DIV/0!	N/A
2	East Marvin St	West Marvin St	0.97	2.34	B	43200.00	3.15	C	4.28	E	#DIV/0!	N/A
3	West Marvin St	Roselle Ave	0.89	2.14	B	10512.00	3.22	C	4.34	E	#DIV/0!	N/A
4	Roselle Ave	Waring Rd	1.45	2.14	F (v/c>1)	12600.00	4.35	E	2.05	B	#DIV/0!	N/A
5	Waring Rd	Vista Way	2.54	3.19	F (v/c>1)	14400.00	3.77	D	2.18	B	5.88	F

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM, SA**

Limits: **Thunder Drive to Vista Way**

Scenario: **Existing AM**

Analysis Direction	SB

(Down Direction on this Sheet)

Users Must Input Data In Light Green Shaded Areas

Thunder Dr

Segment #1

Pedestrian Walking Speed (ft/s)	Pedestrian Flow Rate (ped/hr)
4.0	1

Segment Volume Data	
Vehicle Flow Rate (vph)	2,072
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	2.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	1,737
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	43
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
SSSC	0%

East Marvin St

Segment #2

Pedestrian Flow Rate (ped/hr)
2

Segment Volume Data	
Vehicle Flow Rate (vph)	2,054
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	4.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	338
Speed Limit (mph)	45
Left Turn Pocket?	No
Avg. Travel Time (s)	14
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	71%

West Marvin St

Segment #3

Pedestrian Flow Rate (ped/hr)
2

Segment Volume Data	
Vehicle Flow Rate (vph)	2,090
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	4.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	1,277
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	41
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	75%

Roselle Ave

Segment #4

Pedestrian Flow Rate (ped/hr)
3

Segment Volume Data	
Vehicle Flow Rate (vph)	2,106
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	10.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	2,208
Speed Limit (mph)	50
Left Turn Pocket?	Yes
Avg. Travel Time (s)	92
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	39%

Waring Rd

Segment #5

Pedestrian Flow Rate (ped/hr)
2

Segment Volume Data	
Vehicle Flow Rate (vph)	2,693
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	4.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	850
Speed Limit (mph)	35
Left Turn Pocket?	Yes
Avg. Travel Time (s)	61
Avg. Stops (#/veh)	1

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	34%

Vista Way

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

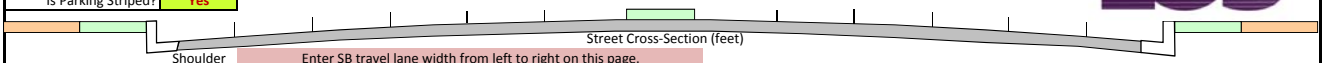
Street: College Boulevard | Limits: Thunder Drive to Vista Way

Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM, SA | Date: 3/18/2015

From: Thunder Dr | To: East Marvin St

1									
Fixed Object Width (ft)	Parking Occupancy %								
1.0	85%								
Is Curb Present?	Yes								
Is Parking Striped?	Yes								
Median Type (0-3)	3								
Pavement Condition	4.0								

SB | NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	4.0	7.5	5.0	10.0	11.0			16.0

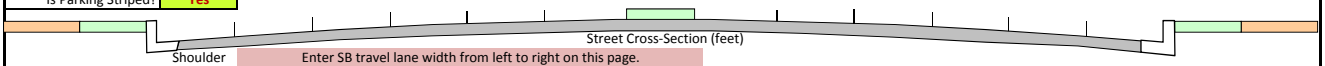
0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.73	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #2

From: East Marvin St | To: West Marvin St

2									
Fixed Object Width (ft)	Parking Occupancy %								
1.0	85%								
Is Curb Present?	Yes								
Is Parking Striped?	Yes								
Median Type (0-3)	3								
Pavement Condition	4.0								

SB | NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	4.0	7.5	5.0	10.0	10.0			17.0

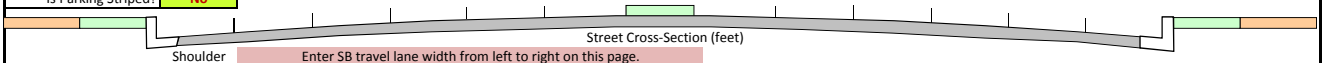
0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
1.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #3

From: West Marvin St | To: Roselle Ave

3									
Fixed Object Width (ft)	Parking Occupancy %								
1.0	85%								
Is Curb Present?	Yes								
Is Parking Striped?	No								
Median Type (0-3)	3								
Pavement Condition	4.0								

SB | NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	7.5	5.0	10.0	11.0			17.0

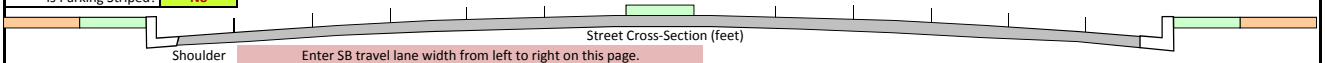
0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.35	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #4

From: Roselle Ave | To: Waring Rd

4									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								
Median Type (0-3)	3								
Pavement Condition	4.0								

SB | NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	5.0	11.0	12.0			17.0

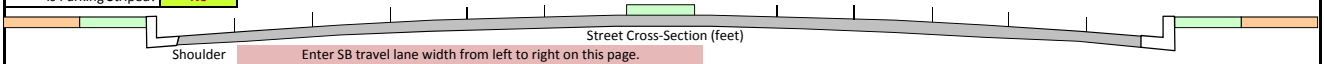
0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #5

From: Waring Rd | To: Vista Way

5									
Fixed Object Width (ft)	Parking Occupancy %								
1.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								
Median Type (0-3)	3								
Pavement Condition	4.0								

SB | NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	4.0	0.0	5.0	10.0	10.0	10.0		5.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM, SA**

Limits: **Thunder Drive to Vista Way**

Scenario: **Existing PM**

Analysis Direction	SB

(Down Direction on this Sheet)

Users Must Input Data In Light Green Shaded Areas

Thunder Dr

Segment #1

Pedestrian Walking Speed (ft/s)	Pedestrian Flow Rate (ped/hr)
4.0	2

Segment Volume Data	
Vehicle Flow Rate (vph)	2,198
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	3.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	1,737
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	49
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
SSSC	0%

East Marvin St

Segment #2

Pedestrian Flow Rate (ped/hr)
1

Segment Volume Data	
Vehicle Flow Rate (vph)	2,204
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	8.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	338
Speed Limit (mph)	45
Left Turn Pocket?	No
Avg. Travel Time (s)	10
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	64%

West Marvin St

Segment #3

Pedestrian Flow Rate (ped/hr)
5

Segment Volume Data	
Vehicle Flow Rate (vph)	2,263
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	6.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	1,277
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	37
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	73%

Roselle Ave

Segment #4

Pedestrian Flow Rate (ped/hr)
4

Segment Volume Data	
Vehicle Flow Rate (vph)	2,358
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	15.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	2,208
Speed Limit (mph)	50
Left Turn Pocket?	Yes
Avg. Travel Time (s)	72
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	40%

Waring Rd

Segment #5

Pedestrian Flow Rate (ped/hr)
4

Segment Volume Data	
Vehicle Flow Rate (vph)	3,112
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	8.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	850
Speed Limit (mph)	35
Left Turn Pocket?	Yes
Avg. Travel Time (s)	134
Avg. Stops (#/veh)	1

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	23%

Vista Way

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

Street: College Boulevard | Limits: Thunder Drive to Vista Way

Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM, SA | Date: 3/18/2015

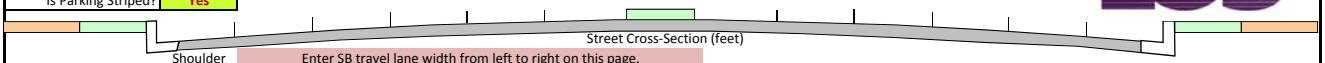
From: Thunder Dr To: East Marvin St

1

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
1.0	100%	Yes	Yes

Median Type (0-3): 3
Pavement Condition: 4.0

SB | NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	4.0	7.5	5.0	10.0	11.0			16.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.73	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #2

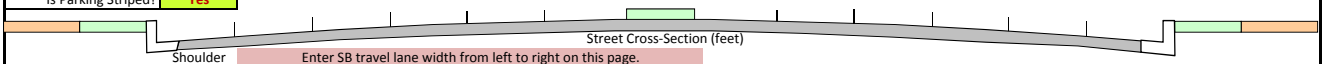
From: East Marvin St To: West Marvin St

2

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
1.0	100%	Yes	Yes

Median Type (0-3): 3
Pavement Condition: 4.0

SB | NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	4.0	7.5	5.0	10.0	10.0			17.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
1.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #3

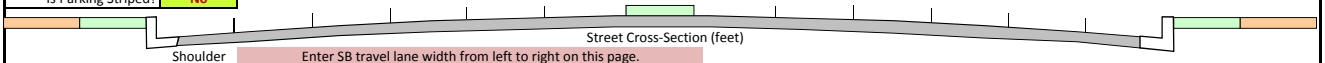
From: West Marvin St To: Roselle Ave

3

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
1.0	100%	Yes	No

Median Type (0-3): 3
Pavement Condition: 4.0

SB | NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	7.5	5.0	10.0	11.0			17.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.35	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #4

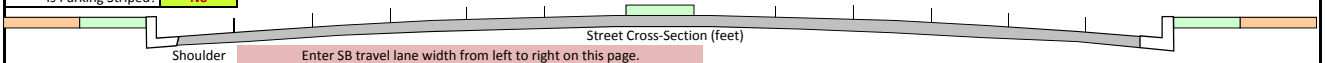
From: Roselle Ave To: Waring Rd

4

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
0.0	0%	Yes	No

Median Type (0-3): 3
Pavement Condition: 4.0

SB | NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	0.0	0.0	5.0	11.0	12.0			17.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)		
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)		
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)	2115	1321
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)		

Segment #5

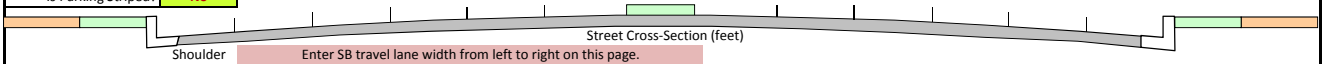
From: Waring Rd To: Vista Way

5

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
1.0	0%	Yes	No

Median Type (0-3): 3
Pavement Condition: 4.0

SB | NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	4.0	0.0	5.0	10.0	10.0	10.0		5.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street College Boulevard | Direction Southbound | Date 3/18/2015

Limits Vista Way to Plaza Drive | Scenario Existing AM | Analyst CM, SA

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Vista Way	78 EB Off Ramp	0.85	4.40	E	#DIV/0!	4.63	#DIV/0!	1.91	A	#DIV/0!	N/A
2	78 EB Off Ramp	Plaza Dr	0.71	5.80	F	#DIV/0!	4.98	#DIV/0!	1.99	A	#DIV/0!	N/A
3												
4												
5												

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street College Boulevard Direction Southbound Date 3/18/2015

Limits Vista Way to Plaza Drive Scenario Existing PM Analyst CM

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Vista Way	78 EB Off Ramp	0.96	4.40	E	#DIV/0!	4.82	#DIV/0!	1.96	A	#DIV/0!	N/A
2	78 EB Off Ramp	Plaza Dr	0.76	5.80	F	#DIV/0!	5.35	#DIV/0!	2.07	B	#DIV/0!	N/A
3												
4												
5												

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM, SA**

Limits: **Vista Way to Plaza Drive**

Scenario: **Existing AM**

Analysis Direction	SB

(Down Direction on this Sheet)

Users Must Input Data In Light Green Shaded Areas

Vista Way

Segment #1

Pedestrian Walking Speed (ft/s)	Pedestrian Flow Rate (ped/hr)
4.0	0

Segment Volume Data	
Vehicle Flow Rate (vph)	3,616
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	0.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	481
Speed Limit (mph)	35
Left Turn Pocket?	No
Avg. Travel Time (s)	20
Avg. Stops (#/veh)	1

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	64%

78 EB Off Ramp

Segment #2

Pedestrian Flow Rate (ped/hr)
0

Segment Volume Data	
Vehicle Flow Rate (vph)	3,203
Peak Hour Factor	0.92
Heavy Vehicle %	2.0%
Left/Right Turns %	32.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	221
Speed Limit (mph)	35
Left Turn Pocket?	Yes
Avg. Travel Time (s)	11
Avg. Stops (#/veh)	1

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	65%

Plaza Dr

Segment #3

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

Segment #4

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

Segment #5

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

Street: College Boulevard | Limits: Vista Way to Plaza Drive

Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM, SA | Date: 3/18/2015

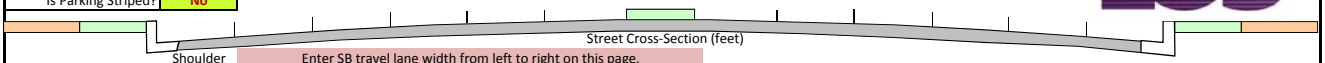
From: Vista Way To: 78 EB Off Ramp

1

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
0.0	0%	Yes	No

Median Type (0-3)	Pavement Condition
2	4.0

SB NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
0.0	0.0	0.0	5.0	11.0	11.0	11.0	11.0	10.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #2

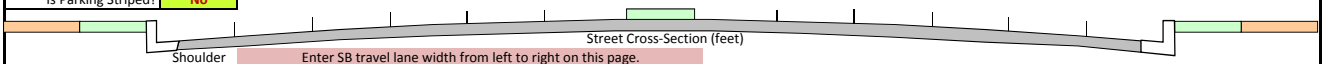
From: 78 EB Off Ramp To: Plaza Dr

2

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
0.0	0%	Yes	No

Median Type (0-3)	Pavement Condition
2	4.0

SB NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
0.0	0.0	0.0	5.0	11.0	11.0	11.0		4.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #3

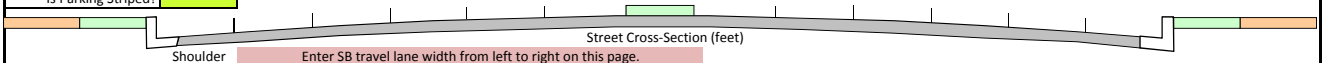
From: To:

3

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?

Median Type (0-3)	Pavement Condition

SB NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #4

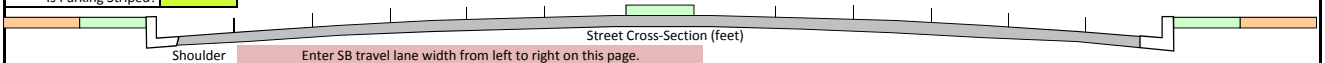
From: To:

4

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?

Median Type (0-3)	Pavement Condition

SB NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #5

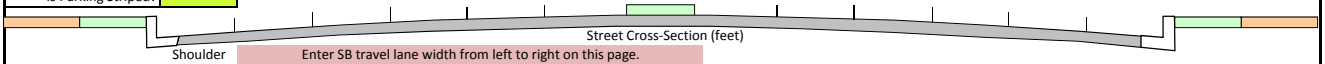
From: To:

5

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?

Median Type (0-3)	Pavement Condition

SB NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM**

Limits: **Vista Way to Plaza Drive**

Scenario: **Existing PM**

Analysis Direction	SB

(Down Direction on this Sheet)

Users Must Input Data In Light Green Shaded Areas

Vista Way

Segment #1

Pedestrian Walking Speed (ft/s)	Pedestrian Flow Rate (ped/hr)
4.0	0

Segment Volume Data	
Vehicle Flow Rate (vph)	4,045
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	0.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	481
Speed Limit (mph)	35
Left Turn Pocket?	No
Avg. Travel Time (s)	29
Avg. Stops (#/veh)	1

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	61%

78 EB Off Ramp

Segment #2

Pedestrian Flow Rate (ped/hr)
0

Segment Volume Data	
Vehicle Flow Rate (vph)	3,735
Peak Hour Factor	0.96
Heavy Vehicle %	2.0%
Left/Right Turns %	38.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	221
Speed Limit (mph)	35
Left Turn Pocket?	Yes
Avg. Travel Time (s)	14
Avg. Stops (#/veh)	1

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	62%

Plaza Dr

Segment #3

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

Segment #4

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

Segment #5

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

Street: College Boulevard | Limits: Vista Way to Plaza Drive

Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM | Date: 3/18/2015

From: Vista Way To: 78 EB Off Ramp

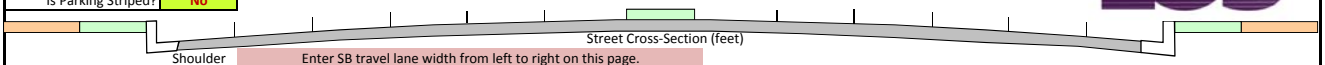
1

Fixed Object Width (ft)	Parking Occupancy %
0.0	0%

Is Curb Present? Yes
Is Parking Striped? No

Median Type (0-3): 2
Pavement Condition: 4.0

SB NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
0.0	0.0	0.0	5.0	11.0	11.0	11.0	11.0	10.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #2

From: 78 EB Off Ramp To: Plaza Dr

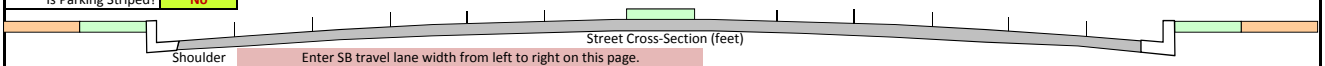
2

Fixed Object Width (ft)	Parking Occupancy %
0.0	0%

Is Curb Present? Yes
Is Parking Striped? No

Median Type (0-3): 2
Pavement Condition: 4.0

SB NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
0.0	0.0	0.0	5.0	11.0	11.0	11.0		4.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #3

From: To:

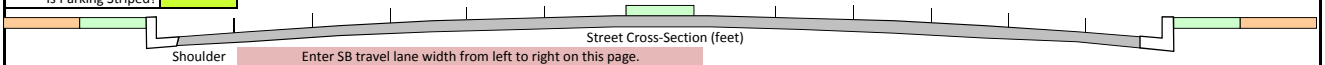
3

Fixed Object Width (ft)	Parking Occupancy %

Is Curb Present?
Is Parking Striped?

Median Type (0-3):
Pavement Condition:

SB NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #4

From: To:

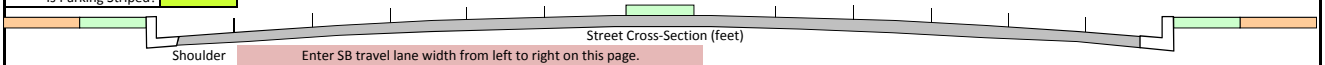
4

Fixed Object Width (ft)	Parking Occupancy %

Is Curb Present?
Is Parking Striped?

Median Type (0-3):
Pavement Condition:

SB NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #5

From: To:

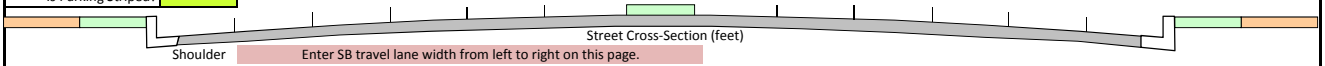
5

Fixed Object Width (ft)	Parking Occupancy %

Is Curb Present?
Is Parking Striped?

Median Type (0-3):
Pavement Condition:

SB NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Worksheets – Future (2035) Conditions with Recommended Alternative

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street College Boulevard | Direction Northbound | Date 3/18/2015

Limits Plaza Drive to West Marvin Street | Scenario Recommended AM | Analyst CM, SA

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Plaza Dr	SR 78 EB Off Ramp	0.99	2.34	B	8159.99	3.53	D	1.71	A	#DIV/0!	N/A
2	SR 78 EB Off Ramp	Vista Way	0.80	4.04	D	6870.85	3.98	D	2.02	B	#DIV/0!	N/A
3	Vista Way	Waring Rd	0.83	3.29	C	10285.71	3.91	D	2.19	B	5.79	F
4	Waring Rd	Roselle Ave	0.87	2.14	B	72000.00	4.93	E	2.96	C	#DIV/0!	N/A
5	Roselle Ave	West Marvin St	0.89	2.14	B	52704.00	3.57	D	4.18	D	#DIV/0!	N/A

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street College Boulevard | Direction Northbound | Date 3/18/2015

Limits Plaza Drive to West Marvin Street | Scenario Recommended PM | Analyst CM, SA

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Plaza Dr	SR 78 EB Off Ramp	1.19	2.34	F (v/c>1)	4895.99	3.82	D	1.78	A	#DIV/0!	N/A
2	SR 78 EB Off Ramp	Vista Way	1.04	2.14	F (v/c>1)	3435.42	4.18	D	2.06	B	#DIV/0!	N/A
3	Vista Way	Waring Rd	1.13	2.14	F (v/c>1)	14400.00	4.25	E	2.26	B	5.85	F
4	Waring Rd	Roselle Ave	1.00	2.14	B	36000.00	5.12	F	2.94	C	#DIV/0!	N/A
5	Roselle Ave	West Marvin St	0.89	2.14	B	13176.00	3.90	D	4.63	E	#DIV/0!	N/A

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM, SA**

Limits: **Plaza Drive to West Marvin Street**

Scenario: **Recommended AM**

Analysis Direction	NB

(Down Direction on this Sheet)

Users Must Input Data In Light Green Shaded Areas

Plaza Dr

Segment #1

Pedestrian Walking Speed (ft/s)	Pedestrian Flow Rate (ped/hr)
4.0	6

Segment Volume Data	
Vehicle Flow Rate (vph)	3,730
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	0.0%
Thru Adj. Sat. (vphgl)	1,500

Segment Layout and Speed Data	
Segment Length (ft)	212
Speed Limit (mph)	35
Left Turn Pocket?	No
Avg. Travel Time (s)	10
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	64%

SR 78 EB Off Ramp

Segment #2

Pedestrian Flow Rate (ped/hr)
7

Segment Volume Data	
Vehicle Flow Rate (vph)	4,550
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	51.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	504
Speed Limit (mph)	35
Left Turn Pocket?	Yes
Avg. Travel Time (s)	31
Avg. Stops (#/veh)	1

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	42%

Vista Way

Segment #3

Pedestrian Flow Rate (ped/hr)
7

Segment Volume Data	
Vehicle Flow Rate (vph)	3,150
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	42.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	789
Speed Limit (mph)	35
Left Turn Pocket?	Yes
Avg. Travel Time (s)	28
Avg. Stops (#/veh)	1

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	44%

Waring Rd

Segment #4

Pedestrian Flow Rate (ped/hr)
1

Segment Volume Data	
Vehicle Flow Rate (vph)	2,580
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	14.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	2,175
Speed Limit (mph)	50
Left Turn Pocket?	Yes
Avg. Travel Time (s)	38
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	72%

Roselle Ave

Segment #5

Pedestrian Flow Rate (ped/hr)
1

Segment Volume Data	
Vehicle Flow Rate (vph)	2,480
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	6.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	1,000
Speed Limit (mph)	25
Left Turn Pocket?	Yes
Avg. Travel Time (s)	28
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	74%

West Marvin St

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

Street: College Boulevard | Limits: Plaza Drive to West Marvin Street

Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM, SA | Date: 3/18/2015

From: Plaza Dr | To: SR 78 EB Off Ramp

1

Fixed Object Width (ft)	Parking Occupancy %
1.0	0%
Is Curb Present?	Yes
Is Parking Striped?	No

Median Type (0-3)	2
Pavement Condition	4.0

NB SB

Street Cross-Section (feet)

Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	5.0	12.0	12.0	11.0	10.0	4.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.60	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #2

From: SR 78 EB Off Ramp | To: Vista Way

2

Fixed Object Width (ft)	Parking Occupancy %
1.0	0%
Is Curb Present?	Yes
Is Parking Striped?	No

Median Type (0-3)	3
Pavement Condition	4.0

NB SB

Street Cross-Section (feet)

Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	5.0	11.0	12.0	11.0	10.0	10.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.66	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #3

From: Vista Way | To: Waring Rd

3

Fixed Object Width (ft)	Parking Occupancy %
0.0	0%
Is Curb Present?	Yes
Is Parking Striped?	No

Median Type (0-3)	3
Pavement Condition	4.0

NB SB

Street Cross-Section (feet)

Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	5.0	10.0	11.0	10.0		4.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #4

From: Waring Rd | To: Roselle Ave

4

Fixed Object Width (ft)	Parking Occupancy %
0.0	0%
Is Curb Present?	Yes
Is Parking Striped?	No

Median Type (0-3)	3
Pavement Condition	4.0

NB SB

Street Cross-Section (feet)

Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	5.0	10.0	10.0			20.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #5

From: Roselle Ave | To: West Marvin St

5

Fixed Object Width (ft)	Parking Occupancy %
1.0	85%
Is Curb Present?	Yes
Is Parking Striped?	Yes

Median Type (0-3)	3
Pavement Condition	4.0

NB SB

Street Cross-Section (feet)

Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	7.5	5.0	10.0	12.0			18.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.34	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM, SA**

Limits: **Plaza Drive to West Marvin Street**

Scenario: **Recommended PM**

Analysis Direction	NB

(Down Direction on this Sheet)

Users Must Input Data In Light Green Shaded Areas

Plaza Dr

Segment #1

Pedestrian Walking Speed (ft/s)	4.0
Pedestrian Flow Rate (ped/hr)	10

Segment Volume Data	
Vehicle Flow Rate (vph)	4,280
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	0.0%
Thru Adj. Sat. (vphgl)	1,500

Segment Layout and Speed Data	
Segment Length (ft)	212
Speed Limit (mph)	
Left Turn Pocket?	No
Avg. Travel Time (s)	11
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	61%

SR 78 EB Off Ramp

Segment #2

Pedestrian Flow Rate (ped/hr)	14

Segment Volume Data	
Vehicle Flow Rate (vph)	4,930
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	37.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	504
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	41
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	45%

Vista Way

Segment #3

Pedestrian Flow Rate (ped/hr)	5

Segment Volume Data	
Vehicle Flow Rate (vph)	3,620
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	28.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	789
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	30
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	46%

Waring Rd

Segment #4

Pedestrian Flow Rate (ped/hr)	2

Segment Volume Data	
Vehicle Flow Rate (vph)	2,890
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	10.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	2,175
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	44
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	74%

Roselle Ave

Segment #5

Pedestrian Flow Rate (ped/hr)	4

Segment Volume Data	
Vehicle Flow Rate (vph)	2,750
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	11.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	1,000
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	27
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	78%

West Marvin St

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

Street: College Boulevard | Limits: Plaza Drive to West Marvin Street

Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM, SA | Date: 3/18/2015

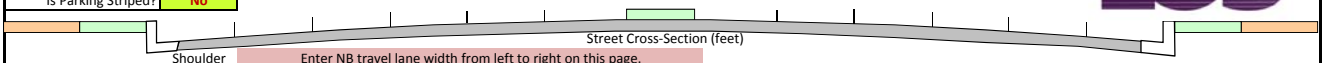
From: Plaza Dr | To: SR 78 EB Off Ramp

1

Fixed Object Width (ft)	Parking Occupancy %
1.0	0%
Is Curb Present?	Yes
Is Parking Striped?	No

Median Type (0-3)	2
Pavement Condition	4.0

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	5.0	12.0	12.0	11.0	10.0	4.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.60	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #2

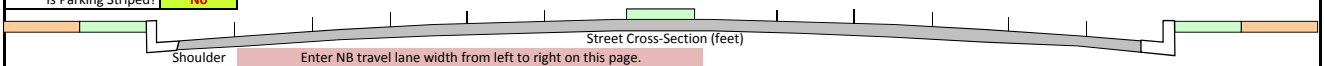
From: SR 78 EB Off Ramp | To: Vista Way

2

Fixed Object Width (ft)	Parking Occupancy %
1.0	0%
Is Curb Present?	Yes
Is Parking Striped?	No

Median Type (0-3)	3
Pavement Condition	4.0

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	5.0	11.0	12.0	11.0	10.0	10.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.66	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #3

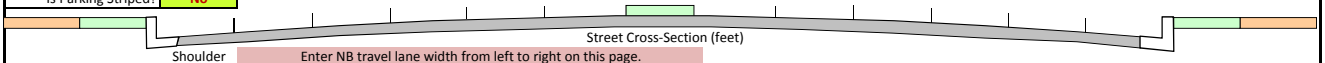
From: Vista Way | To: Waring Rd

3

Fixed Object Width (ft)	Parking Occupancy %
0.0	0%
Is Curb Present?	Yes
Is Parking Striped?	No

Median Type (0-3)	3
Pavement Condition	4.0

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	5.0	10.0	11.0	10.0		4.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #4

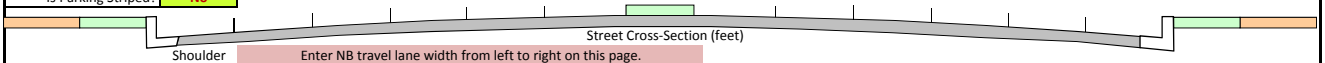
From: Waring Rd | To: Roselle Ave

4

Fixed Object Width (ft)	Parking Occupancy %
0.0	0%
Is Curb Present?	Yes
Is Parking Striped?	No

Median Type (0-3)	3
Pavement Condition	4.0

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	5.0	10.0	10.0			20.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #5

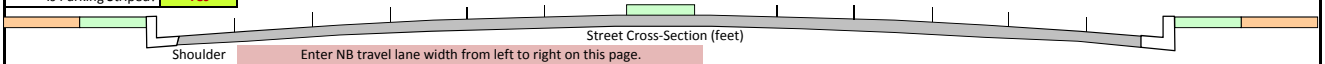
From: Roselle Ave | To: West Marvin St

5

Fixed Object Width (ft)	Parking Occupancy %
1.0	85%
Is Curb Present?	Yes
Is Parking Striped?	Yes

Median Type (0-3)	3
Pavement Condition	3.0

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	7.5	5.0	10.0	12.0			18.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.34	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street: College Boulevard | Direction: Northbound | Date: 3/18/2015

Limits: West Marvin Street to Aztec Street | Scenario: Recommended AM | Analyst: CM, SA

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	West Marvin St	East Marvin St	0.67	2.34	B	22320.00	3.37	C	3.84	D	#DIV/0!	N/A
2	East Marvin St	Thunder Dr	1.20	2.14	F (v/c>1)	24192.00	3.15	C	3.93	D	#DIV/0!	N/A
3	Thunder Dr	Olive Dr	1.89	2.14	F (v/c>1)	24000.00	4.72	E	2.13	B	#DIV/0!	N/A
4	Olive Dr	Oceanside Blvd	0.85	2.14	B	36000.00	4.55	E	1.53	A	#DIV/0!	N/A
5	Oceanside Blvd	Aztec St	0.70	2.14	B	24000.00	3.67	D	1.25	A	#DIV/0!	N/A

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street College Boulevard | Direction Northbound | Date 3/18/2015

Limits West Marvin Street to Aztec Street | Scenario Recommended PM | Analyst CM, SA

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	West Marvin St	East Marvin St	0.75	2.34	B	22320.00	3.59	D	4.12	D	#DIV/0!	N/A
2	East Marvin St	Thunder Dr	1.13	2.14	F (v/c>1)	48384.00	3.32	C	4.12	D	#DIV/0!	N/A
3	Thunder Dr	Olive Dr	1.56	2.14	F (v/c>1)	24000.00	5.03	F	2.18	B	#DIV/0!	N/A
4	Olive Dr	Oceanside Blvd	1.69	2.14	F (v/c>1)	10285.71	4.68	E	1.55	A	#DIV/0!	N/A
5	Oceanside Blvd	Aztec St	0.88	2.14	B	7999.99	4.30	E	1.44	A	#DIV/0!	N/A

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM, SA**

Limits: **West Marvin Street to Aztec Street**

Scenario: **Recommended AM**

Analysis Direction	NB

(Down Direction on this Sheet)

Users Must Input Data In Light Green Shaded Areas

West Marvin St

Segment #1

Pedestrian Walking Speed (ft/s)
4.0

Pedestrian Flow Rate (ped/hr)
2

Segment Volume Data	
Vehicle Flow Rate (vph)	2,360
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	5.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	298
Speed Limit (mph)	
Left Turn Pocket?	No
Avg. Travel Time (s)	10
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
SSSC	

East Marvin St

Segment #2

Pedestrian Flow Rate (ped/hr)
2

Segment Volume Data	
Vehicle Flow Rate (vph)	2,390
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	4.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	1,758
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	56
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	54%

Thunder Dr

Segment #3

Pedestrian Flow Rate (ped/hr)
3

Segment Volume Data	
Vehicle Flow Rate (vph)	2,810
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	10.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	2,160
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	71
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	38%

Olive Dr

Segment #4

Pedestrian Flow Rate (ped/hr)
2

Segment Volume Data	
Vehicle Flow Rate (vph)	4,180
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	48.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	1,171
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	59
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	51%

Oceanside Blvd

Segment #5

Pedestrian Flow Rate (ped/hr)
3

Segment Volume Data	
Vehicle Flow Rate (vph)	2,810
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	6.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	1,327
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	35
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	75%

Aztec St

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

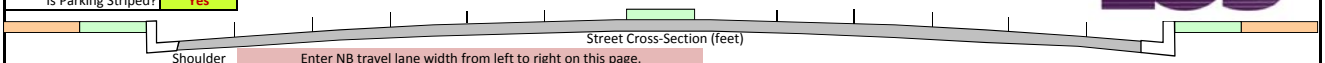
Street: College Boulevard | Limits: West Marvin Street to Aztec Street

Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM, SA | Date: 3/18/2015

From: West Marvin St To: East Marvin St

1									
Fixed Object Width (ft)	Parking Occupancy %								
1.0	85%								
Is Curb Present?	Yes								
Is Parking Striped?	Yes								
Median Type (0-3)	3								
Pavement Condition	4.0								

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	7.5	5.0	10.0	10.0			17.0

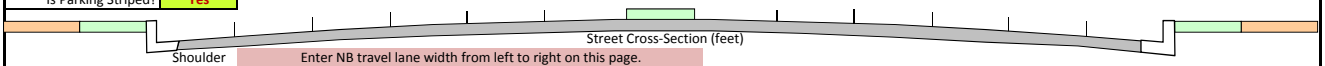
0.10	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.10	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.40	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #2

From: East Marvin St To: Thunder Dr

2									
Fixed Object Width (ft)	Parking Occupancy %								
1.0	85%								
Is Curb Present?	Yes								
Is Parking Striped?	Yes								
Median Type (0-3)	3								
Pavement Condition	4.0								

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	7.5	5.0	10.0	11.0			17.0

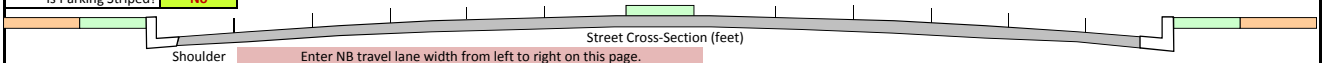
0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.64	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
Yes	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #3

From: Thunder Dr To: Olive Dr

3									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								
Median Type (0-3)	3								
Pavement Condition	4.0								

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	5.0	11.0	11.0			21.0

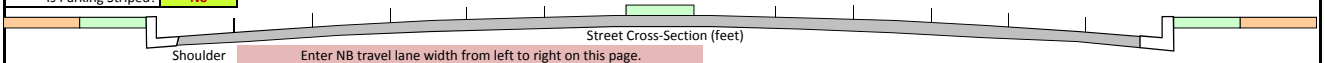
0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #4

From: Olive Dr To: Oceanside Blvd

4									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								
Median Type (0-3)	3								
Pavement Condition	5.0								

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	6.0	11.0	11.0	11.0		14.0

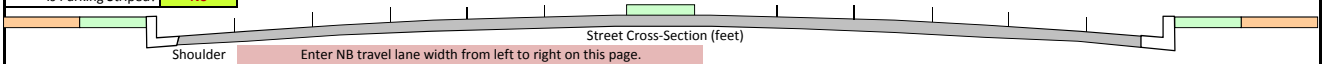
0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #5

From: Oceanside Blvd To: Aztec St

5									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								
Median Type (0-3)	3								
Pavement Condition	5.0								

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	7.0	11.0	11.0	11.0		14.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM, SA**

Limits: **West Marvin Street to Aztec Street**

Scenario: **Recommended PM**

Analysis Direction	NB

(Down Direction on this Sheet)

Users Must Input Data In Light Green Shaded Areas

West Marvin St

Segment #1

Pedestrian Walking Speed (ft/s)	Pedestrian Flow Rate (ped/hr)
4.0	2

Segment Volume Data	
Vehicle Flow Rate (vph)	2,640
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	5.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	298
Speed Limit (mph)	
Left Turn Pocket?	No
Avg. Travel Time (s)	10
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
SSSC	

East Marvin St

Segment #2

Pedestrian Flow Rate (ped/hr)
1

Segment Volume Data	
Vehicle Flow Rate (vph)	2,620
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	7.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	1,758
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	58
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	61%

Thunder Dr

Segment #3

Pedestrian Flow Rate (ped/hr)
3

Segment Volume Data	
Vehicle Flow Rate (vph)	3,120
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	10.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	2,160
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	82
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	51%

Olive Dr

Segment #4

Pedestrian Flow Rate (ped/hr)
7

Segment Volume Data	
Vehicle Flow Rate (vph)	4,400
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	33.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	1,171
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	86
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	35%

Oceanside Blvd

Segment #5

Pedestrian Flow Rate (ped/hr)
9

Segment Volume Data	
Vehicle Flow Rate (vph)	3,570
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	4.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	1,327
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	32
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	78%

Aztec St

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

Street: College Boulevard | Limits: West Marvin Street to Aztec Street

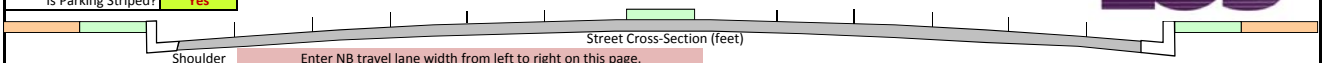
Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM, SA | Date: 3/18/2015

From: West Marvin St To: East Marvin St

1									
Fixed Object Width (ft)	Parking Occupancy %								
1.0	100%								
Is Curb Present?	Yes								
Is Parking Striped?	Yes								

Median Type (0-3): 3
Pavement Condition: 4.0

NB | SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	7.5	5.0	10.0	10.0			17.0

0.10	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.10	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.40	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

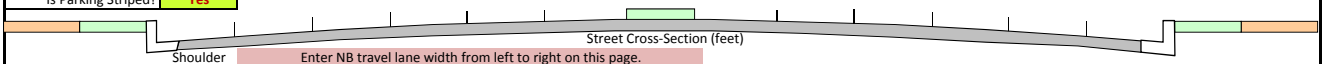
Segment #2

From: East Marvin St To: Thunder Dr

2									
Fixed Object Width (ft)	Parking Occupancy %								
1.0	100%								
Is Curb Present?	Yes								
Is Parking Striped?	Yes								

Median Type (0-3): 3
Pavement Condition: 4.0

NB | SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	7.5	5.0	10.0	11.0			17.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.64	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
Yes	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

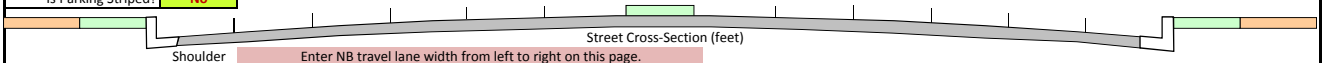
Segment #3

From: Thunder Dr To: Olive Dr

3									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 4.0

NB | SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	5.0	11.0	11.0			21.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

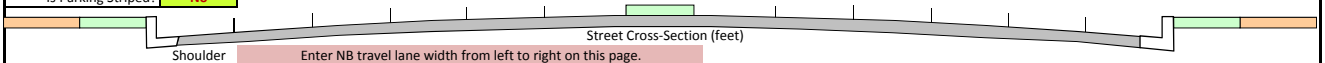
Segment #4

From: Olive Dr To: Oceanside Blvd

4									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 5.0

NB | SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	6.0	11.0	11.0	11.0		14.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

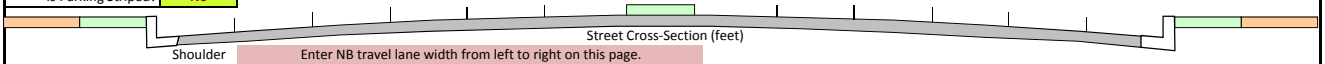
Segment #5

From: Oceanside Blvd To: Aztec St

5									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 5.0

NB | SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	7.0	11.0	11.0	11.0		14.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street College Boulevard Direction Northbound Date 3/18/2015

Limits Aztec Street to Old Grove Rd Scenario Recommended AM Analyst CM, SA

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Aztec Street	Avenida De La Plata	1.29	2.14	F (v/c>1)	36000.00	3.74	D	1.77	A	#DIV/0!	N/A
2	Avenida De La Plata	Old Grove Rd	0.60	2.14	B	28800.00	3.62	D	1.72	A	#DIV/0!	N/A
3												
4												
5												

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street College Boulevard | Direction Northbound | Date 3/18/2015

Limits Aztec Street to Old Grove Rd | Scenario Recommended PM | Analyst CM, SA

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Aztec Street	Avenida De La Plata	0.99	2.14	B	7999.99	4.33	E	1.93	A	#DIV/0!	N/A
2	Avenida De La Plata	Old Grove Rd	0.83	2.14	B	28800.00	4.09	D	1.86	A	#DIV/0!	N/A
3												
4												
5												

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM, SA**

Limits: **Aztec Street to Old Grove Rd**

Scenario: **Recommended AM**

Analysis Direction	NB

(Down Direction on this Sheet)

Users Must Input Data In Light Green Shaded Areas

Aztec Street

Segment #1

Pedestrian Walking Speed (ft/s)	Pedestrian Flow Rate (ped/hr)
4.0	2

Segment Volume Data	
Vehicle Flow Rate (vph)	2,820
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	20.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	919
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	23
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	35%

Avenida De La Plata

Segment #2

Pedestrian Flow Rate (ped/hr)
2

Segment Volume Data	
Vehicle Flow Rate (vph)	2,680
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	33.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	1,565
Speed Limit (mph)	45
Left Turn Pocket?	Yes
Avg. Travel Time (s)	40
Avg. Stops (#/veh)	0

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	57%

Old Grove Rd

Segment #3

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

Segment #4

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

Segment #5

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

Street: College Boulevard | Limits: Aztec Street to Old Grove Rd

Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM, SA | Date: 3/18/2015

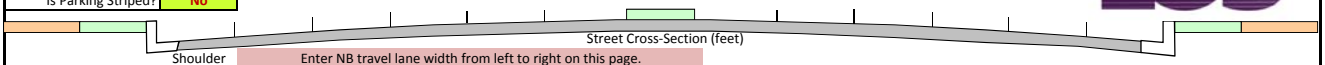
From: Aztec Street To: Avenida De La Plata

1

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
0.0	0%	Yes	No

Median Type (0-3): 3
Pavement Condition: 5.0

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	6.0	11.0	11.0	11.0		14.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #2

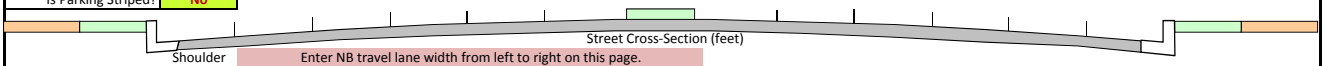
From: Avenida De La Plata To: Old Grove Rd

2

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
1.0	0%	Yes	No

Median Type (0-3): 3
Pavement Condition: 5.0

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	6.0	11.0	11.0	11.0		14.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #3

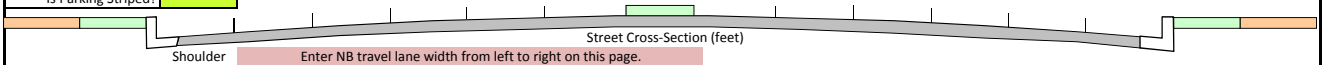
From: To:

3

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?

Median Type (0-3):
Pavement Condition:

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #4

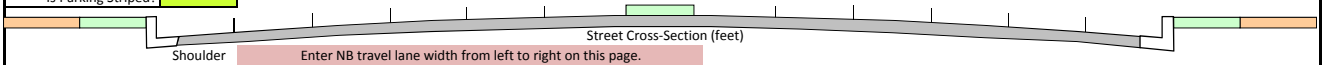
From: To:

4

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?

Median Type (0-3):
Pavement Condition:

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #5

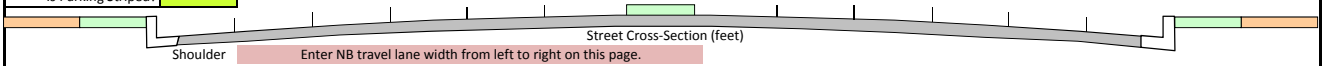
From: To:

5

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?

Median Type (0-3):
Pavement Condition:

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM, SA**

Limits: **Aztec Street to Old Grove Rd**

Scenario: **Recommended PM**

Analysis Direction	NB

(Down Direction on this Sheet)

Aztec Street

Users Must Input Data In Light Green Shaded Areas

Segment #1

Pedestrian Walking Speed (ft/s)	Pedestrian Flow Rate (ped/hr)
4.0	9

Segment Volume Data	
Vehicle Flow Rate (vph)	3,550
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	14.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	919
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	22
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	62%

Avenida De La Plata

Segment #2

Pedestrian Flow Rate (ped/hr)
2

Segment Volume Data	
Vehicle Flow Rate (vph)	3,260
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	29.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	1,565
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	38
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	53%

Old Grove Rd

Segment #3

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

Segment #4

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

Segment #5

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

Street: College Boulevard | Limits: Aztec Street to Old Grove Rd

Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM, SA | Date: 3/18/2015

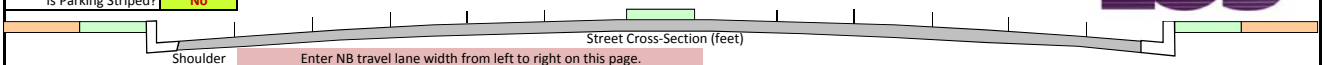
From: Aztec Street To: Avenida De La Plata

1

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
0.0	0%	Yes	No

Median Type (0-3): 3
Pavement Condition: 5.0

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	6.0	11.0	11.0	11.0		14.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #2

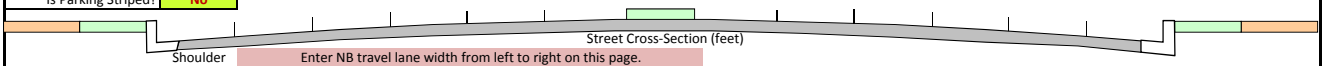
From: Avenida De La Plata To: Old Grove Rd

2

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
1.0	0%	Yes	No

Median Type (0-3): 3
Pavement Condition: 5.0

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	6.0	11.0	11.0	11.0		14.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #3

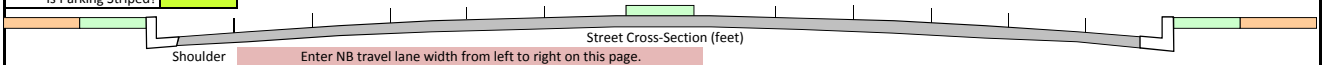
From: To:

3

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?

Median Type (0-3):
Pavement Condition:

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #4

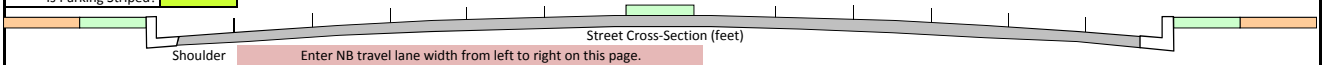
From: To:

4

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?

Median Type (0-3):
Pavement Condition:

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #5

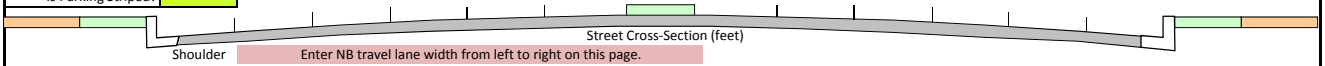
From: To:

5

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?

Median Type (0-3):
Pavement Condition:

NB SB



Shoulder | Enter NB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street College Boulevard | Direction Southbound | Date 3/18/2015

Limits Old Grove Road to Thunder Drive | Scenario Recommended AM | Analyst CM, SA

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Old Grove Rd	Avenida De La Plata	0.94	2.14	B	19200.00	3.11	C	1.79	A	5.62	F
2	Avenida De La Plata	Aztec St	0.75	2.14	B	72000.00	3.80	D	1.83	A	#DIV/0!	N/A
3	Aztec St	Oceanside Blvd	1.36	2.14	F (v/c>1)	12000.00	3.59	D	1.35	A	#DIV/0!	N/A
4	Oceanside Blvd	Olive Dr	0.79	2.14	B	24000.00	4.62	E	1.54	A	5.11	F
5	Olive Dr	Thunder Dr	0.88	2.14	B	14400.00	5.00	E	2.27	B	#DIV/0!	N/A

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street College Boulevard | Direction Southbound | Date 3/18/2015

Limits Old Grove Road to Thunder Drive | Scenario Recommended PM | Analyst CM, SA

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Old Grove Rd	Avenida De La Plata	1.14	2.14	F (v/c>1)	57600.00	3.53	D	1.84	A	5.69	F
2	Avenida De La Plata	Aztec St	0.91	2.14	B	18000.00	4.32	E	1.91	A	#DIV/0!	N/A
3	Aztec St	Oceanside Blvd	1.98	2.14	F (v/c>1)	12000.00	4.21	D	1.47	A	#DIV/0!	N/A
4	Oceanside Blvd	Olive Dr	0.67	2.14	B	4235.28	4.91	E	1.58	A	5.14	F
5	Olive Dr	Thunder Dr	0.99	2.14	B	14400.00	5.26	F	2.29	B	#DIV/0!	N/A

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM, SA**

Limits: **Old Grove Road to Thunder Drive**

Scenario: **Recommended AM**

Analysis Direction	SB

(Down Direction on this Sheet)

Users Must Input Data In Light Green Shaded Areas

Old Grove Rd

Segment #1

Pedestrian Walking Speed (ft/s)	Pedestrian Flow Rate (ped/hr)
4.0	3

Segment Volume Data	
Vehicle Flow Rate (vph)	2,680
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	9.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	1,547
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	43
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	52%

Avenida De La Plata

Segment #2

Pedestrian Flow Rate (ped/hr)
1

Segment Volume Data	
Vehicle Flow Rate (vph)	2,820
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	2.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	868
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	20
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	74%

Aztec St

Segment #3

Pedestrian Flow Rate (ped/hr)
6

Segment Volume Data	
Vehicle Flow Rate (vph)	2,930
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	12.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	1,400
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	76
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	38%

Oceanside Blvd

Segment #4

Pedestrian Flow Rate (ped/hr)
3

Segment Volume Data	
Vehicle Flow Rate (vph)	4,260
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	34.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	1,106
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	53
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	67%

Olive Dr

Segment #5

Pedestrian Flow Rate (ped/hr)
5

Segment Volume Data	
Vehicle Flow Rate (vph)	2,860
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	19.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	2,087
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	43
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	75%

Thunder Dr

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

Street: College Boulevard | Limits: Old Grove Road to Thunder Drive

Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM, SA | Date: 3/18/2015

From: Old Grove Rd To: Avenida De La Plata

1									
Fixed Object Width (ft)	Parking Occupancy %								
1.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 4.0

SB | NB

Street Cross-Section (feet)

Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	6.0	11.0	11.0	11.0		14.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
Yes	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #2

From: Avenida De La Plata To: Aztec St

2									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 5.0

SB | NB

Street Cross-Section (feet)

Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	6.0	11.0	11.0	11.0		14.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #3

From: Aztec St To: Oceanside Blvd

3									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 5.0

SB | NB

Street Cross-Section (feet)

Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	6.0	11.0	11.0	11.0		14.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #4

From: Oceanside Blvd To: Olive Dr

4									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 5.0

SB | NB

Street Cross-Section (feet)

Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	6.0	11.0	11.0	11.0		14.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #5

From: Olive Dr To: Thunder Dr

5									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 4.0

SB | NB

Street Cross-Section (feet)

Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	6.0	11.0	11.0			20.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM, SA**

Limits: **Old Grove Road to Thunder Drive**

Scenario: **Recommended PM**

Analysis Direction	SB

(Down Direction on this Sheet)

Users Must Input Data In Light Green Shaded Areas

Old Grove Rd

Segment #1

Pedestrian Walking Speed (ft/s)	Pedestrian Flow Rate (ped/hr)
4.0	1

Segment Volume Data	
Vehicle Flow Rate (vph)	3,260
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	7.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	1,547
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	45
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	53%

Avenida De La Plata

Segment #2

Pedestrian Flow Rate (ped/hr)
4

Segment Volume Data	
Vehicle Flow Rate (vph)	3,550
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	3.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	868
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	21
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	76%

Aztec St

Segment #3

Pedestrian Flow Rate (ped/hr)
6

Segment Volume Data	
Vehicle Flow Rate (vph)	3,720
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	28.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	1,400
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	69
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	27%

Oceanside Blvd

Segment #4

Pedestrian Flow Rate (ped/hr)
17

Segment Volume Data	
Vehicle Flow Rate (vph)	4,610
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	43.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	1,106
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	46
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	74%

Olive Dr

Segment #5

Pedestrian Flow Rate (ped/hr)
5

Segment Volume Data	
Vehicle Flow Rate (vph)	3,120
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	23.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	2,087
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	45
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	73%

Thunder Dr

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

Street: College Boulevard | Limits: Old Grove Road to Thunder Drive

Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM, SA | Date: 3/18/2015

From: Old Grove Rd To: Avenida De La Plata

1									
Fixed Object Width (ft)	Parking Occupancy %								
1.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 4.0

SB | NB

Street Cross-Section (feet)

Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	6.0	11.0	11.0	11.0		16.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
Yes	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #2

From: Avenida De La Plata To: Aztec St

2									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 5.0

SB | NB

Street Cross-Section (feet)

Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	6.0	11.0	11.0	11.0		14.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #3

From: Aztec St To: Oceanside Blvd

3									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 5.0

SB | NB

Street Cross-Section (feet)

Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	6.0	11.0	11.0	11.0		14.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #4

From: Oceanside Blvd To: Olive Dr

4									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 5.0

SB | NB

Street Cross-Section (feet)

Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	6.0	11.0	11.0	11.0		14.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #5

From: Olive Dr To: Thunder Dr

5									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3
Pavement Condition: 4.0

SB | NB

Street Cross-Section (feet)

Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	6.0	11.0	11.0			20.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street College Boulevard | Direction Southbound | Date 3/18/2015

Limits Thunder Drive to Vista Way | Scenario Recommended AM | Analyst CM, SA

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Thunder Dr	East Marvin St	0.66	2.14	B	47088.00	3.46	C	4.07	D	#DIV/0!	N/A
2	East Marvin St	West Marvin St	1.01	2.34	F (v/c>1)	21600.00	3.49	C	4.11	D	#DIV/0!	N/A
3	West Marvin St	Roselle Ave	0.98	2.14	B	26280.00	3.71	D	4.37	E	#DIV/0!	N/A
4	Roselle Ave	Waring Rd	1.77	2.14	F (v/c>1)	24000.00	4.56	E	2.49	B	#DIV/0!	N/A
5	Waring Rd	Vista Way	1.54	2.14	F (v/c>1)	28800.00	3.88	D	2.19	B	4.52	E

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street College Boulevard Direction Southbound Date 3/18/2015

Limits Thunder Drive to Vista Way Scenario Recommended PM Analyst CM, SA

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Thunder Dr	East Marvin St	0.72	2.14	B	23544.00	3.60	D	4.18	D	#DIV/0!	N/A
2	East Marvin St	West Marvin St	1.27	2.34	F (v/c>1)	43200.00	3.65	D	4.37	E	#DIV/0!	N/A
3	West Marvin St	Roselle Ave	1.07	2.14	F (v/c>1)	10512.00	4.00	D	4.72	E	#DIV/0!	N/A
4	Roselle Ave	Waring Rd	2.02	2.14	F (v/c>1)	18000.00	4.97	E	2.63	B	#DIV/0!	N/A
5	Waring Rd	Vista Way	1.82	2.14	F (v/c>1)	14400.00	4.19	D	2.26	B	5.86	F

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM, SA**

Limits: **Thunder Drive to Vista Way**

Scenario: **Recommended AM**

Analysis Direction	SB

(Down Direction on this Sheet)

Users Must Input Data In Light Green Shaded Areas

Thunder Dr

Segment #1

Pedestrian Walking Speed (ft/s)	Pedestrian Flow Rate (ped/hr)
4.0	1

Segment Volume Data	
Vehicle Flow Rate (vph)	2,410
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	4.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	1,737
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	52
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
SSSC	

East Marvin St

Segment #2

Pedestrian Flow Rate (ped/hr)
2

Segment Volume Data	
Vehicle Flow Rate (vph)	2,430
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	3.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	338
Speed Limit (mph)	
Left Turn Pocket?	No
Avg. Travel Time (s)	10
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	66%

West Marvin St

Segment #3

Pedestrian Flow Rate (ped/hr)
2

Segment Volume Data	
Vehicle Flow Rate (vph)	2,500
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	5.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	1,277
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	30
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	69%

Roselle Ave

Segment #4

Pedestrian Flow Rate (ped/hr)
3

Segment Volume Data	
Vehicle Flow Rate (vph)	2,580
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	11.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	2,208
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	58
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	39%

Waring Rd

Segment #5

Pedestrian Flow Rate (ped/hr)
2

Segment Volume Data	
Vehicle Flow Rate (vph)	3,150
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	5.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	850
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	33
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	39%

Vista Way

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

Street: College Boulevard | Limits: Thunder Drive to Vista Way

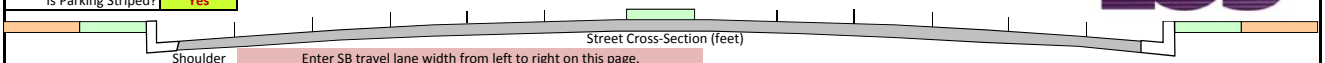
Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM, SA | Date: 3/18/2015

From: Thunder Dr | To: East Marvin St

1									
Fixed Object Width (ft)	Parking Occupancy %								
1.0	85%								
Is Curb Present?	Yes								
Is Parking Striped?	Yes								

Median Type (0-3): 3 | Pavement Condition: 4.0

SB | NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	7.5	5.0	10.0	11.0			16.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.73	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

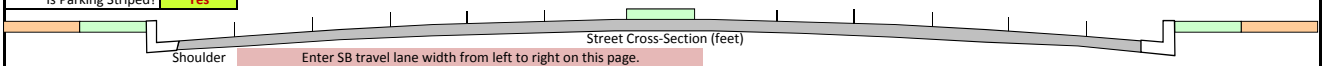
Segment #2

From: East Marvin St | To: West Marvin St

2									
Fixed Object Width (ft)	Parking Occupancy %								
1.0	85%								
Is Curb Present?	Yes								
Is Parking Striped?	Yes								

Median Type (0-3): 3 | Pavement Condition: 4.0

SB | NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	7.5	5.0	10.0	10.0			17.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
1.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

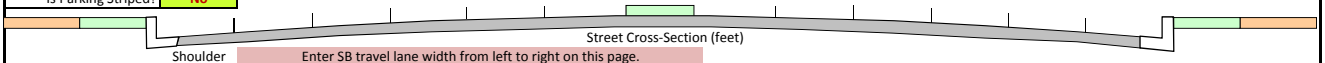
Segment #3

From: West Marvin St | To: Roselle Ave

3									
Fixed Object Width (ft)	Parking Occupancy %								
1.0	85%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3 | Pavement Condition: 4.0

SB | NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	7.5	5.0	10.0	11.0			17.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.35	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

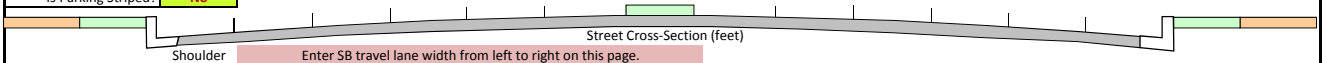
Segment #4

From: Roselle Ave | To: Waring Rd

4									
Fixed Object Width (ft)	Parking Occupancy %								
0.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3 | Pavement Condition: 4.0

SB | NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	5.0	11.0	12.0			17.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)		
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)		
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)	2115	1321
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)		

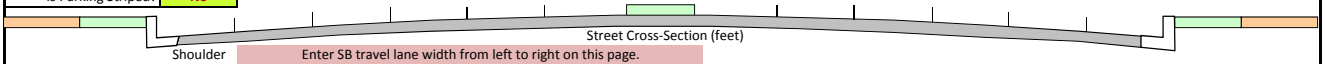
Segment #5

From: Waring Rd | To: Vista Way

5									
Fixed Object Width (ft)	Parking Occupancy %								
1.0	0%								
Is Curb Present?	Yes								
Is Parking Striped?	No								

Median Type (0-3): 3 | Pavement Condition: 4.0

SB | NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	5.0	10.0	10.0	10.0		5.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM, SA**

Limits: **Thunder Drive to Vista Way**

Scenario: **Recommended PM**

Analysis Direction	SB

(Down Direction on this Sheet)

Users Must Input Data In Light Green Shaded Areas

Thunder Dr

Segment #1

Pedestrian Walking Speed (ft/s)	Pedestrian Flow Rate (ped/hr)
4.0	2

Segment Volume Data	
Vehicle Flow Rate (vph)	2,640
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	4.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	1,737
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	56
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
SSSC	

East Marvin St

Segment #2

Pedestrian Flow Rate (ped/hr)
1

Segment Volume Data	
Vehicle Flow Rate (vph)	2,650
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	7.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	338
Speed Limit (mph)	
Left Turn Pocket?	No
Avg. Travel Time (s)	10
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	55%

West Marvin St

Segment #3

Pedestrian Flow Rate (ped/hr)
5

Segment Volume Data	
Vehicle Flow Rate (vph)	2,760
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	6.0%
Thru Adj. Sat. (vphgl)	1,800

Segment Layout and Speed Data	
Segment Length (ft)	1,277
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	27
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	69%

Roselle Ave

Segment #4

Pedestrian Flow Rate (ped/hr)
4

Segment Volume Data	
Vehicle Flow Rate (vph)	2,890
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	16.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	2,208
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	52
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	36%

Waring Rd

Segment #5

Pedestrian Flow Rate (ped/hr)
4

Segment Volume Data	
Vehicle Flow Rate (vph)	3,620
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	7.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	850
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	44
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	37%

Vista Way

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

Street: College Boulevard | Limits: Thunder Drive to Vista Way

Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM, SA | Date: 3/18/2015

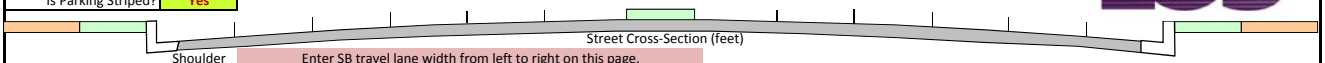
From: Thunder Dr | To: East Marvin St

1

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
1.0	100%	Yes	Yes

Median Type (0-3)	Pavement Condition
3	4.0

SB | NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	7.5	5.0	10.0	11.0			16.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.73	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #2

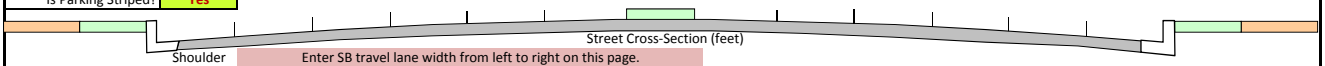
From: East Marvin St | To: West Marvin St

2

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
1.0	100%	Yes	Yes

Median Type (0-3)	Pavement Condition
3	4.0

SB | NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	7.5	5.0	10.0	10.0			17.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
1.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #3

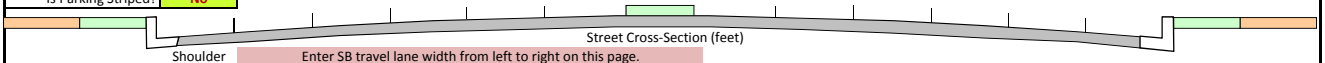
From: West Marvin St | To: Roselle Ave

3

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
1.0	100%	Yes	No

Median Type (0-3)	Pavement Condition
3	4.0

SB | NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	7.5	5.0	10.0	11.0			17.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.35	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #4

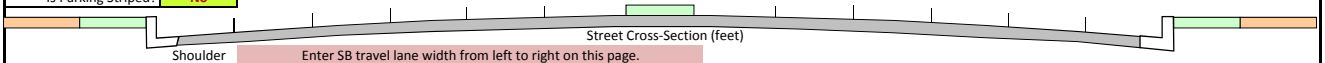
From: Roselle Ave | To: Waring Rd

4

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
0.0	0%	Yes	No

Median Type (0-3)	Pavement Condition
3	4.0

SB | NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	5.0	11.0	12.0			17.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #5

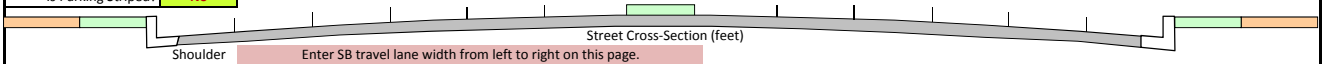
From: Waring Rd | To: Vista Way

5

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
1.0	0%	Yes	No

Median Type (0-3)	Pavement Condition
3	4.0

SB | NB



Shoulder | Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
5.0	5.0	0.0	5.0	10.0	10.0	10.0		5.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street College Boulevard Direction Southbound Date 3/18/2015

Limits Vista Way to Plaza Drive Scenario Recommended AM Analyst CM, SA

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Vista Way	78 EB Off Ramp	1.11	2.34	F (v/c>1)	#DIV/0!	4.96	#DIV/0!	1.98	A	#DIV/0!	N/A
2	78 EB Off Ramp	Plaza Dr	0.91	2.14	B	#DIV/0!	5.35	#DIV/0!	2.07	B	#DIV/0!	N/A
3												
4												
5												

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Results Summary

Street College Boulevard | Direction Southbound | Date 3/18/2015

Limits Vista Way to Plaza Drive | Scenario Recommended PM | Analyst CM, SA

Segment	From	To	Auto Mode			Pedestrian Mode			Bicycle Mode		Transit Mode	
			V/C Ratio	LOS Score	LOS	Ped Space[1]	LOS Score	LOS	LOS Score	LOS	LOS Score	LOS
1	Vista Way	78 EB Off Ramp	1.78	2.34	F (v/c>1)	#DIV/0!	5.18	#DIV/0!	2.03	B	#DIV/0!	N/A
2	78 EB Off Ramp	Plaza Dr	1.16	2.14	F (v/c>1)	#DIV/0!	5.75	#DIV/0!	2.14	B	#DIV/0!	N/A
3												
4												
5												

Note:

1. Pedestrian space is reported in square feet per pedestrian (ft^2/ped)

Source: NCHRP Project 3-70 Multimodal Level of Service For Urban Streets and Highway Capacity Manual 2010, Chapter 17

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM, SA**

Limits: **Vista Way to Plaza Drive**

Scenario: **Recommended AM**

Analysis Direction	SB

(Down Direction on this Sheet)

Users Must Input Data In Light Green Shaded Areas

Vista Way

Segment #1

Pedestrian Walking Speed (ft/s)	Pedestrian Flow Rate (ped/hr)
4.0	0

Segment Volume Data	
Vehicle Flow Rate (vph)	4,160
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	0.0%
Thru Adj. Sat. (vphgl)	1,500

Segment Layout and Speed Data	
Segment Length (ft)	481
Speed Limit (mph)	
Left Turn Pocket?	No
Avg. Travel Time (s)	18
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	64%

78 EB Off Ramp

Segment #2

Pedestrian Flow Rate (ped/hr)
1

Segment Volume Data	
Vehicle Flow Rate (vph)	3,730
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	33.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	221
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	12
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	55%

Plaza Dr

Segment #3

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

Segment #4

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

Segment #5

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

Street: College Boulevard | Limits: Vista Way to Plaza Drive

Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM, SA | Date: 3/18/2015

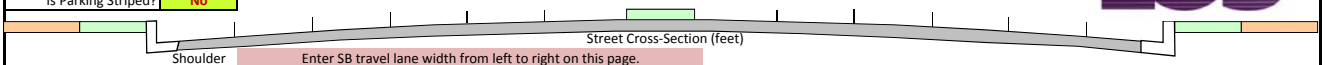
From: Vista Way To: 78 EB Off Ramp

1

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
0.0	0%	Yes	No

Median Type (0-3): 2
Pavement Condition: 4.0

SB NB



Shoulder: Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
0.0	0.0	0.0	5.0	11.0	11.0	11.0	11.0	10.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #2

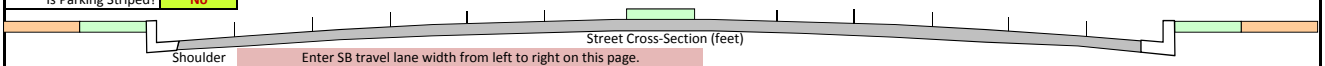
From: 78 EB Off Ramp To: Plaza Dr

2

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
0.0	0%	Yes	No

Median Type (0-3): 2
Pavement Condition: 4.0

SB NB



Shoulder: Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
0.0	0.0	0.0	5.0	11.0	11.0	11.0		4.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #3

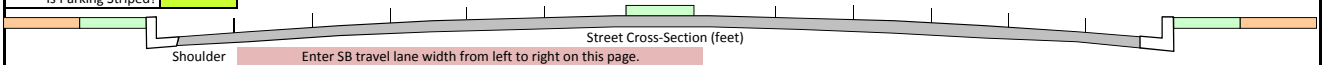
From: To:

3

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?

Median Type (0-3):
Pavement Condition:

SB NB



Shoulder: Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #4

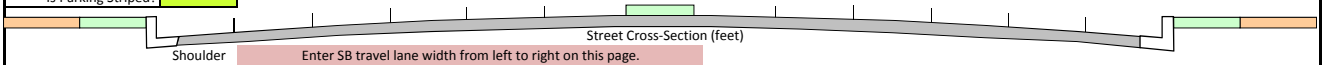
From: To:

4

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?

Median Type (0-3):
Pavement Condition:

SB NB



Shoulder: Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #5

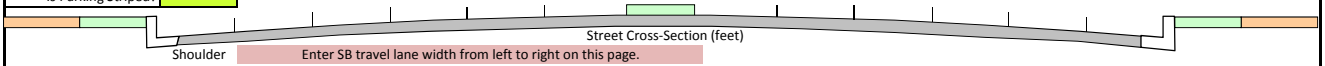
From: To:

5

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?

Median Type (0-3):
Pavement Condition:

SB NB



Shoulder: Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

LOS+ Multimodal Level of Service for Urban Streets
Segment General Data Input Sheet

Date: **3/18/2015**

Street: **College Boulevard**

Analyst: **CM, SA**

Limits: **Vista Way to Plaza Drive**

Scenario: **Recommended PM**

Analysis Direction	SB

(Down Direction on this Sheet)

Users Must Input Data In Light Green Shaded Areas

Vista Way

Segment #1

Pedestrian Walking Speed (ft/s)	Pedestrian Flow Rate (ped/hr)
4.0	0

Segment Volume Data	
Vehicle Flow Rate (vph)	4,610
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	0.0%
Thru Adj. Sat. (vphgl)	1,500

Segment Layout and Speed Data	
Segment Length (ft)	481
Speed Limit (mph)	
Left Turn Pocket?	No
Avg. Travel Time (s)	21
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	44%

78 EB Off Ramp

Segment #2

Pedestrian Flow Rate (ped/hr)
0

Segment Volume Data	
Vehicle Flow Rate (vph)	4,280
Peak Hour Factor	0.98
Heavy Vehicle %	2.0%
Left/Right Turns %	39.0%
Thru Adj. Sat. (vphgl)	1,700

Segment Layout and Speed Data	
Segment Length (ft)	221
Speed Limit (mph)	
Left Turn Pocket?	Yes
Avg. Travel Time (s)	16
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)
Signal	45%

Plaza Dr

Segment #3

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

Segment #4

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

Segment #5

Pedestrian Flow Rate (ped/hr)

Segment Volume Data	
Vehicle Flow Rate (vph)	
Peak Hour Factor	
Heavy Vehicle %	
Left/Right Turns %	
Thru Adj. Sat. (vphgl)	

Segment Layout and Speed Data	
Segment Length (ft)	
Speed Limit (mph)	
Left Turn Pocket?	
Avg. Travel Time (s)	
Avg. Stops (#/veh)	

Intersection Data

Intersection Control	Green/Cycle for Thru (%)

LOS+ Multimodal Level of Service for Urban Streets
Street Cross-Section Input Data Sheet

Street: College Boulevard | Limits: Vista Way to Plaza Drive

Segment #1 | General guidance on input parameters is provided at the bottom of this sheet. | Analyst: CM, SA | Date: 3/18/2015

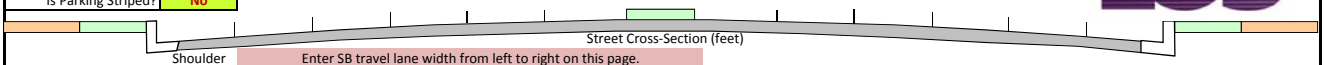
From: Vista Way To: 78 EB Off Ramp

1

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
0.0	0%	Yes	No

Median Type (0-3): 2
Pavement Condition: 4.0

SB NB



Shoulder: Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
0.0	0.0	0.0	5.0	11.0	11.0	11.0	11.0	10.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #2

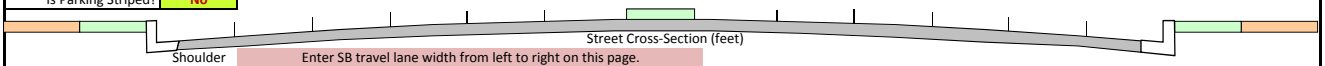
From: 78 EB Off Ramp To: Plaza Dr

2

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?
0.0	0%	Yes	No

Median Type (0-3): 2
Pavement Condition: 4.0

SB NB



Shoulder: Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median
0.0	0.0	0.0	5.0	11.0	11.0	11.0		4.0

0.00	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
0.00	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
No	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #3

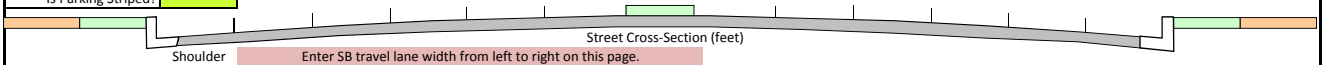
From: To:

3

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?

Median Type (0-3):
Pavement Condition:

SB NB



Shoulder: Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #4

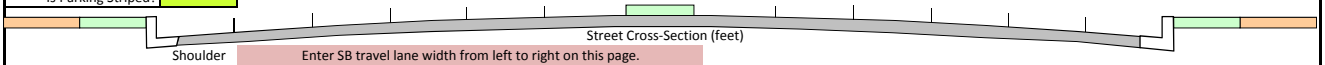
From: To:

4

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?

Median Type (0-3):
Pavement Condition:

SB NB



Shoulder: Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)

Segment #5

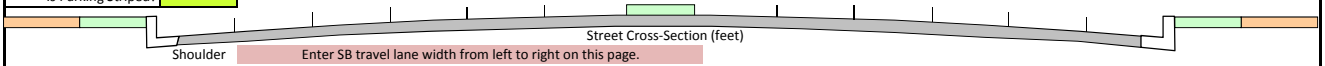
From: To:

5

Fixed Object Width (ft)	Parking Occupancy %	Is Curb Present?	Is Parking Striped?

Median Type (0-3):
Pavement Condition:

SB NB



Shoulder: Enter SB travel lane width from left to right on this page.

Sidewalk	Buffer	Parking	Bike Lane	Trav. Lane	Trav. Lane	Trav. Lane	Trav. Lane	Median

	Proportion of Sidewalk Length Adjacent to a Window Display (decimal)
	Proportion of Sidewalk Length Adjacent to a Building Face (decimal)
	Proportion of Sidewalk Length Adjacent to a Fence or Low Wall (decimal)
	Does buffer contain continous barrier at least 3 ft high and average spacing of 20 ft or less? (i.e., trees or bollards)