Appendix H:
Traffic Impact Analysis

KUNZMAN ASSOCIATES, INC.

SIGNAL HILL BUSINESS CENTER

TRAFFIC IMPACT ANALYSIS

Final (July 2019)

Traffic Engineering | Transportation Planning | Parking | Noise/Vibration | Expert Witness
Air Quality | Global Climate Change | Health Risk Assessment

SIGNAL HILL BUSINESS CENTER

TRAFFIC IMPACT ANALYSIS

Final (July 2019)

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EXECUTIVE SUMMARY

The purpose of this traffic impact analysis is to provide an assessment of traffic operations resulting from development of the proposed Signal Hill Business Center project and to identify measures necessary to mitigate potentially significant traffic impacts. The traffic issues related to the proposed land use and development have been evaluated in the context of the California Environmental Quality Act (CEQA). The City of Signal Hill is the lead agency responsible for evaluation of potential environmental impacts associated with the proposed project. This report analyzes traffic impacts for the anticipated project opening year in Year 2020 and for a 20-year forecast reflective of the City of Signal Hill General Plan buildout.

Although this is a technical traffic impact analysist, every effort has been made to write the report clearly and concisely. To assist the reader with those terms unique to transportation engineering, a glossary of terms is provided in Appendix A.

A. Project Description

The project site is generally bounded by Gundry Avenue to the west, Gundry Hill Apartments and American University of Health Sciences to the north, Gaviota Avenue to the east, and Signal Hill city limits and Alamitos Avenue to the south. The project site is currently vacant. The project site is proposed to consist of developing the project site with a business park consisting of nine buildings totaling 139,080 square feet plus 12,000 square feet of mezzanine, for a total of 151,080 square feet of gross floor area. Full access driveways are proposed at Gundry Avenue, Walnut Avenue, and Alamitos Avenue. The proposed project is anticipated to be constructed and fully operational by Year 2020.

The western portion of the project site is currently zoned Light Industrial. The eastern portion of the project site is currently zoned Commercial Office and therefore requires a zone change to Light Industrial.

B. Traffic Conditions

Existing Conditions: The study intersections currently operate within acceptable Levels of Service (D or better) during the peak hours for Existing traffic conditions.

Project Trips: The proposed project is forecast to generate a total of approximately 2,320 daily vehicle trips, including 212 vehicle trips during the morning peak hour and 214 vehicle trips during the evening peak hour. The proposed project is forecast to generate a total of approximately 2,668 daily trips in passenger car equivalents, including 244 passenger car equivalent trips during the morning peak hour and 246 passenger car equivalent trips during the evening peak hour (see Table 2).

Existing Plus Project Conditions: The study intersections are projected to operate within acceptable Levels of Service (D or better) during the peak hours for Existing Plus Project traffic conditions (Table 4). Based on the established thresholds of significance, the proposed project is forecast to result in no significant traffic impacts at the study intersections for Existing Plus Project traffic conditions (see Table 5).

Opening Year (2020) Without Project: The study intersections are projected to operate within acceptable Levels of Service (D or better) during the peak hours for Opening Year (2020) Without Project traffic conditions (see Table 6).

Opening Year (2020) With Project: The study intersections are projected to operate within acceptable Levels of Service (D or better) during the peak hours for Opening Year (2020) With Project traffic conditions. The proposed project is forecast to result in no significant traffic impacts at the study intersections for Opening Year (2020) With Project traffic conditions (see Table 8).

General Plan Buildout (Year 2040) Without Project: The study intersections are projected to operate within acceptable Levels of Service (D or better) during the peak hours for General Plan Buildout (Year 2040) Without Project traffic conditions, except for the following study intersections (see Table 9):

- Orange Avenue/Spring Street - #1 (morning/evening peak hours)
- Orange Avenue/Willow Street - #2 (morning/evening peak hours)
- Cherry Avenue/Willow Street - #15 (evening peak hour only)

General Plan Buildout (Year 2040) With Project: The study intersections are projected to operate within acceptable Levels of Service (D or better) during the peak hours for General Plan Buildout (Year 2040) With Project traffic conditions without mitigation, except for the following study intersections (see Table 10):

- Orange Avenue/Spring Street - #1 (morning/evening peak hours)
- Orange Avenue/Willow Street - #2 (morning/evening peak hours)
- Cherry Avenue/Willow Street - #15 (evening peak hour only)

The proposed project is forecast to result in no significant traffic impacts at the study intersections for General Plan Buildout (Year 2040) With Project traffic conditions (see Table 11).

Congestion Management Program (CMP): The proposed project is forecast to result in no significant traffic impacts at Congestion Management Program monitored intersections for the evaluated scenarios.

C. Off-Site Mitigation Measures

No off-site mitigation measure improvements were identified since the proposed project is forecast to result in no significant traffic impacts at the study intersections for the scenarios analyzed.

D. Circulation Recommendations

Site-specific circulation and access recommendations are depicted on Figure 39.

Construct site-adjacent roadways along the project site boundary at their ultimate half-section width, including landscaping and parkway improvements in conjunction with development, or required by the City of Signal Hill Public Works Department.

All on-site and site-adjacent improvements, including traffic signing/striping and project driveways, should be constructed as approved by the City of Signal Hill Public Works Department.

Sight distance at project access points should comply with applicable City of Signal Hill /California Department of Transportation sight distance standards. The final grading, landscaping, and street improvement plans should demonstrate that sight distance standards are met.

As is the case for any roadway design, the City of Signal Hill should periodically review traffic operations in the vicinity of the project once the project is constructed to assure that the traffic operations are satisfactory.

I. INTRODUCTION

This section describes the purpose of this traffic impact analysis, project location, proposed development, and study area. Figure 1 shows the project location map and Figure 2 illustrates the project site plan.

A. Purpose and Objectives

The purpose of this traffic impact analysis is to provide an assessment of traffic operations resulting from development of the proposed Signal Hill Business Center and to identify measures necessary to mitigate potentially significant traffic impacts. The traffic issues related to the proposed land use and development have been evaluated in the context of the California Environmental Quality Act (CEQA). The City of Signal Hill is the lead agency responsible for evaluation of potential environmental impacts associated with the proposed project. This report analyzes traffic impacts for the anticipated project opening year in 2020.

Although this is a technical traffic impact analysist, every effort has been made to write the report clearly and concisely. To assist the reader with those terms unique to transportation engineering, a glossary of terms is provided in Appendix A.

B. Project Description

The project site is generally bounded by Gundry Avenue to the west, Gundry Hill Apartments and American University of Health Sciences to the north, Gaviota Avenue to the east, and Signal Hill city limits and Alamitos Avenue to the south. The project site is currently vacant. The project site is proposed to consist of developing the project site with a business park consisting of nine buildings totaling 139,080 square feet plus 12,000 square feet of mezzanine, for a total of 151,080 square feet of gross floor area. Full access driveways are proposed at Gundry Avenue, Walnut Avenue, and Alamitos Avenue. The proposed project is anticipated to be constructed and fully operational by Year 2020.

The western portion of the project site is currently zoned Light Industrial. The eastern portion of the project site is currently zoned Commercial Office and therefore requires a zone change to Light Industrial.

C. Study Area

Based on the study intersection identified by the City of Signal Hill Traffic Engineer, the study area consists of the following 20 study intersections within the City of Signal Hill, City of Long Beach, and California Department of Transportation jurisdiction:

Study Intersection	Jurisdiction
Orange Avenue (NS)[1] at:	
Spring Street (EW) - #1	Signal Hill/Long Beach
Willow Street (EW) - #2	Signal Hill/Long Beach
Burnett Street (EW) - #3	Signal Hill
Hill Street (EW) - #4	Signal Hill/Long Beach
Pacific Coast Highway [State Route 1] (EW) - #5	Caltrans[2]
Gundry Avenue (NS) at:	
Hill Street (EW) - #6	Signal Hill
Walnut Avenue (NS) at:	
Spring Street (EW) - #7	Signal Hill/Long Beach
Willow Street (EW) - #8	Signal Hill
Burnett Street (EW) - #9	Signal Hill
Hill Street (EW) - #10	Signal Hill
20th Street/Alamitos Avenue (EW) - #11	Long Beach
Pacific Coast Highway [State Route 1] (EW) - #12	Caltrans
Gaviota Avenue (NS) at:	
Hill Street (EW) - #13	Signal Hill
Cherry Avenue (NS) at:	
Spring Street (EW) - #14	Signal Hill/Long Beach
Willow Street (EW) - #15	Signal Hill
Burnett Street (EW) - #16	Signal Hill
Hill Street (EW) - #17	Signal Hill
Alameda Street (EW) - #18	Signal Hill
20th Street (EW) - #19	Signal Hill
Pacific Coast Highway [State Route 1] (EW) - #20	Caltrans

D. Analysis Scenarios

The following scenarios are analyzed:

- Existing Conditions
- Existing Plus Project Conditions
- Opening Year (2020) Without Project Conditions
- Opening Year (2020) With Project Conditions
- General Plan Buildout (Year 2040) Without Project Conditions
- General Plan Buildout (Year 2040) With Project Conditions

[1] (NS) = North-South roadway; (EW) = East-West roadway

[2] Caltrans = California Department of Transportation

Figure 1
Project Location Map

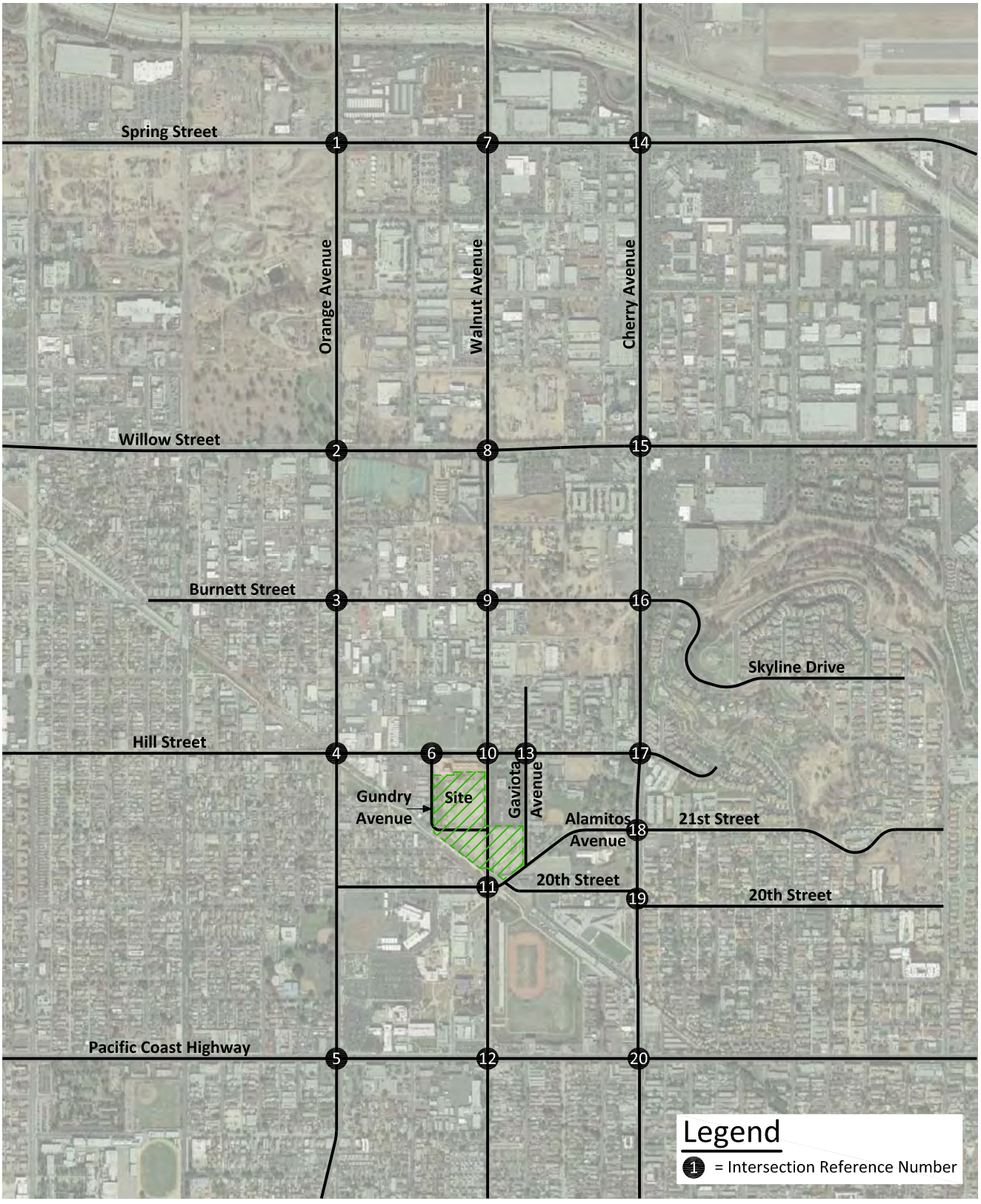
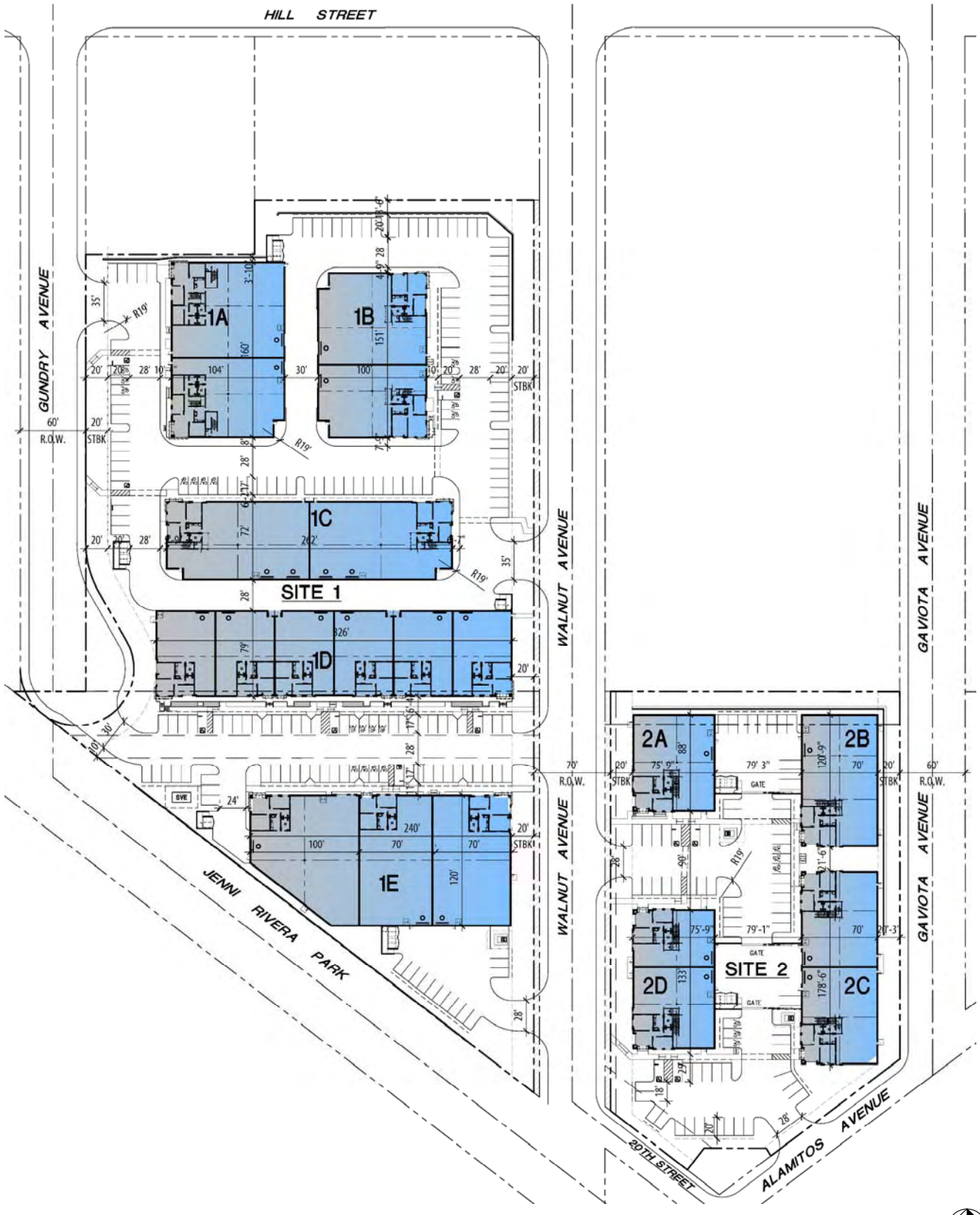


Figure 2
Site Plan



Source: GAA Architects

II. METHODOLOGY

This section discusses the methodologies used to assess intersection performance as adopted by the respective jurisdictional agencies. Level of Service analysis was performed using the Vistro (Version 5.00-03) software.

A. Intersection Capacity Utilization Methodology

Analysis of signalized intersections within the Cities of Signal Hill and Long Beach is based on the Intersection Capacity Utilization methodology. The Intersection Capacity Utilization methodology compares the volume of traffic using the intersection to the capacity of the intersection. The resulting volume-to-capacity ratio represents that portion of the hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity.

The volume-to-capacity ratio is then correlated to a performance measure known as Level of Service based on the following thresholds:

Level of Service	Volume/Capacity Ratio
A	≤ 0.600
B	0.601 to 0.700
C	0.701 to 0.800
D	0.801 to 0.900
E	0.901 to 1.000
F	> 1.000

Source: Transportation Research Board, Interim Materials on Highway Capacity, Transportation Research Circular No. 212, January 1980.

Level of Service is used to qualitatively describe the performance of a roadway facility, ranging from Level of Service A (free-flow conditions) to Level of Service F (extreme congestion and system failure).

Based on City of Long Beach guidelines[1], the Intersection Capacity Utilization analysis utilizes the following parameters: 1,600 vehicles per hour per lane for through and turn lanes, 2,880 vehicles per hour for dual left-turn lanes, and a total clearance adjustment of 10 percent (i.e., 0.10 added to critical Volume/Capacity).

If the paved lane width of a shared through/right turn lane is wide enough to permit a separate right turn, it is common practice for a right turn lane to be considered “de facto.” To function as a de facto right turn lane there must be sufficient width for right turning vehicles to travel outside the through lane. This analysis uses a minimum lane width of 19 feet from curb to lane stripe, but in most cases the lane was 20 feet or greater.

[1] City of Long Beach Traffic Impact Analysis (TIA) Guidelines; date unspecified.

Additionally, a de facto right turn lane was only considered where on-street parking is prohibited near the intersection approach.

B. Intersection Delay Methodology

The technique used to assess the performance of unsignalized intersections and intersections within the California Department of Transportation jurisdiction is known as the intersection delay method based on the procedures contained in the Highway Capacity Manual. The methodology compares the volume of traffic using the intersection to the capacity of the intersection to calculate the delay associated with the traffic control at the intersection. The intersection delay is then correlated to a performance measure known as Level of Service based on the following thresholds:

Level of Service	Intersection Control Delay (Seconds / Vehicle)	
	Signalized Intersection	Unsignalized Intersection
A	≤ 10.0	≤ 10.0
B	> 10.0 to ≤ 20.0	> 10.0 to ≤ 15.0
C	> 20.0 to ≤ 35.0	> 15.0 to ≤ 25.0
D	> 35.0 to ≤ 55.0	> 25.0 to ≤ 35.0
E	> 55.0 to ≤ 80.0	> 35.0 to ≤ 50.0
F	> 80.0	> 50.0

Source: Transportation Research Board, Highway Capacity Manual (6th Edition).

Level of Service is used to qualitatively describe the performance of a roadway facility, ranging from Level of Service A (free-flow conditions) to Level of Service F (extreme congestion and system failure).

C. Performance Standards

Cities of Signal Hill/Long Beach. Both the Cities of Signal Hill and Long Beach consider Level of Service D to be the lowest acceptable Level of Service.

California Department of Transportation. As stated in the Guide for the Preparation of Traffic Impact Studies (State of California, 2002), "California Department of Transportation endeavors to maintain a target LOS [Level of Service] at the transition between LOS "C" and LOS "D" on State highway facilities". The California Department of Transportation acknowledges this may not always be feasible and recommends consultation with the California Department of Transportation to determine the appropriate target Level of Service. For consistency with local requirements, this analysis defines Level of Service D as the minimum acceptable Level of Service for State Highway facilities.

D. Thresholds of Significance

City of Signal Hill. The intersection mitigation requirement should include (all) following elements:

- Drop of 0.02 (2%) in LOS (ICU); or

- 40 vehicles added to an intersection; or

- Left-turn queue length is greater than the existing storage length.

The second and third criteria are evaluated separately in the Signal Hill Business Center Supplemental Traffic Analysis (Ganddini Group, Inc., July 2019). These criteria are used as initial indicators for determining if mitigation is appropriate or necessary based upon closer evaluation. Mitigation may not be necessary in cases where the intersection operates within acceptable Levels of Service.

City of Long Beach. For signalized study intersections within City of Long Beach jurisdiction, a project traffic impact is considered significant if:

- The addition of project-generated trips is forecast to cause an intersection to deteriorate from acceptable Level of Service (D or better) to unacceptable Level of Service (E or F); or,
- The addition of project-generated trips is forecast to cause an increase in volume-to-capacity of 0.02 or greater when the intersection is operating at unacceptable Level of Service (E or F) in the baseline condition.

For intersections located on the City boundary lines, the project impact is evaluated based on City of Signal Hill significant impact thresholds since the City of Long Beach significant impact thresholds are generally consistent with or less stringent than the City of Signal Hill criteria.

California Department of Transportation. Based on the California Department of Transportation established performance standards, a potentially significant traffic impact is defined to occur if the addition of project generated trips is forecast to cause the performance of a State Highway study intersection to change from acceptable operation (Level of Service D or better) to deficient operation (Level of Service E or F).

It should be noted that many jurisdictions, including the Cities of Signal Hill and Long Beach, do not have established significant impact thresholds for unsignalized intersections. For this traffic impact analysis, a project impact at an unsignalized intersection is considered significant if the addition of project-generated trips is forecast to cause or worsen Level of Service E or F and installation of a traffic signal is warranted.

If a project is forecast to cause a significant traffic impact, feasible mitigation measures that will reduce the impact to a less than significant level are identified. Mitigation measures can be in many forms, including the addition of lanes, traffic control modification, or demand management measures. If no feasible mitigation measures can be identified for a significantly impacted facility, the impact will remain significant and unavoidable and a statement of overriding considerations is required.

III. EXISTING CONDITIONS

A. Existing Roadway System

Figure 3 identifies the lane geometry and intersection traffic controls for Existing conditions based on a field survey of the study area. Regional access to the project area is provided by the Interstate 405 Freeway approximately 1.3-miles north of the project site and Pacific Coast Highway (State Route 1) approximately 0.4-miles to the south. Key north-south roadways providing local circulation include Orange Avenue, Gundry Avenue, Walnut Avenue, Gaviota Avenue, and Cherry Avenue. Key east-west roadways providing local circulation include Spring Street, Willow Street, Burnett Street, Hill Street, and Pacific Coast Highway.

Orange Avenue is a two to four lane divided roadway north of Hill Street and a two to four lane undivided roadway south of Hill Street. Orange Avenue is classified as a Principal Arterial (100-110 foot right-of-way) in the City of Signal Hill General Plan. On-street parking is prohibited north of Willow Street. On-street parking is generally permitted on the southbound side between Willow Street and Burnett Street and generally permitted on both sides south of Burnett Street. Dedicated Class II (marked/on-street) bicycle lanes are provided south of Pacific Coast Highway. Sidewalks are generally provided on both sides of the roadway except between Spring Street and Willow Street.

Gundry Avenue is a two lane undivided roadway in the project vicinity. Gundry Avenue is not classified in the City of Signal Hill General Plan. On-street parking is generally permitted; there are no dedicated bicycle lanes in the project vicinity. Sidewalks are currently provided along both sides of the roadway except along the project site frontage.

Walnut Avenue is a two lane divided/undivided roadway in the project vicinity. Walnut Avenue is classified as a Minor Arterial (80 foot right-of-way) roadway in the City of Signal Hill General Plan. On-street parking is generally permitted; there are no dedicated bicycle lanes. There are several incomplete sections of sidewalk between the north study area limits and Burnett Street; sidewalks are provided on both sides of the roadway south of Burnett Street.

Gaviota Avenue is a two lane divided/undivided roadway in the project vicinity. Gaviota Avenue is not classified in the City of Signal Hill General Plan. On-street parking is generally permitted; there are no dedicated bicycle lanes in the project vicinity. Sidewalks are currently provided along both sides of the roadway.

Cherry Avenue is a six lane divided roadway from the north study area limits to Willow Street. Cherry Avenue transitions to a four lane divided roadway between Willow Street and Burnett Street. South of Pacific Coast Highway, Cherry Avenue is a two lane divided roadway. Cherry Avenue is classified as a Principal Arterial (100-110 foot right-of-way) roadway in the City of Signal Hill General Plan. On-street parking is prohibited on both sides of the roadway north of 21st Street and between 20th Street and Pacific Coast Highway; on-street parking is generally permitted between 21st Street and 20th Street and south of

Pacific Coast Highway. There are no dedicated bicycle lanes in the project vicinity. Sidewalks are currently provided along both sides of the roadway.

Spring Street is a six lane divided roadway in the project vicinity. Willow Street is classified as a Principal Arterial (100-110 foot right-of-way) roadway in the City of Signal Hill General Plan. On-street parking is prohibited; there are no dedicated bicycle lanes west of Orange Avenue. Sidewalks are currently provided on both sides of the roadway within the study area.

Willow Street is a four lane divided roadway in the project vicinity. Spring Street is classified as a Principal Arterial (100-110 foot right-of-way) roadway in the City of Signal Hill General Plan. On-street parking is prohibited; there are no dedicated bicycle lanes in the project vicinity. Sidewalks are currently provided on both sides of the roadway within the study area except for portion along of the westbound approach at Walnut Avenue.

Burnett Street is a two lane undivided roadway in the project vicinity. Burnett Street is classified as a Collector (60-70 foot right-of-way) roadway in the City of Signal Hill General Plan. On-street parking is generally permitted; there are no dedicated bicycle lanes in the project vicinity. Sidewalks are provided intermittently west of Walnut Avenue. Between Walnut Avenue and Cherry Avenue, there are no sidewalks provided along undeveloped frontage.

Hill Street is a two lane undivided roadway in the project vicinity. Burnett Street is classified as a Minor Arterial (80 foot right-of-way) roadway in the City of Signal Hill General Plan. On-street parking is generally permitted; there are no dedicated bicycle lanes in the project vicinity. Sidewalks are currently provided on both sides of the roadway.

Pacific Coast Highway (SR-1) is a six lane divided roadway in the project vicinity. Pacific Coast Highway is classified as a Principal Arterial (100-110 foot right-of-way) roadway in the City of Signal Hill General Plan. On-street parking is generally prohibited; there are no dedicated bicycle lanes in the project vicinity. Sidewalks are currently provided on both sides of the roadway within the study area.

B. Existing Pedestrian, Bicycle, and Transit Facilities

Existing bicycle and pedestrian facilities in the project vicinity are shown on Figure 4. As shown on Figure 4, pedestrian sidewalks are currently provided along all project-adjacent roadways, except Gundry Avenue. There is currently a Class I (separated/multi-use) bicycle path through the Jenni Rivera Park adjacent to the southwest project site boundary.

Figure 5 shows the Long Beach Transit system map. As shown on Figure 5, Long Beach Transit Routes 171, 172, 173, and 174 run along Pacific Coast Highway, with bus stops located within 1/3-mile walking distance from the project site at Walnut Avenue. Long Beach Transit Routes 71 and 72 run along Orange Avenue, with bus stops located within approximately 1/4-mile walking distance at Wesley Drive and 20th Street. Long Beach Transit Routes 21 and 22 run along Cherry Avenue, with bus stops located within approximately 1/4-mile walking distance at Alamitos Avenue/21st Street. A Metro Blue Line

(light rail) station is located just over one mile west of the project site at Long Beach Boulevard/Pacific Coast Highway.

C. General Plan Context

Figure 6 shows the City of Signal Hill General Plan Circulation Element roadway classifications map. This figure shows the nature and extent of arterial and collector highways that are needed to adequately serve the ultimate development depicted by the Land Use Element of the General Plan. The City of Signal Hill standard roadway cross-sections are illustrated on Figure 7.

Figure 8 shows the designated truck routes as identified in the City of Signal Hill General Plan. Figure 9 illustrates the City of Signal Bikeway Master Plan. Figure 10 shows the Signal Hill bus and light rail routes, including bus stop locations within the City of Signal Hill. Figure 11 illustrates primary pedestrian access routes for City of Signal Hill schools.

D. Existing Traffic Volumes

Existing peak hour traffic volumes are based upon morning peak period and evening peak period intersection turning movement counts obtained in September 2017 during typical weekday conditions. The morning peak period was counted between 7:00 AM and 9:00 AM and the evening peak period was counted between 4:00 PM and 6:00 PM. The actual peak hour within the peak period is the four consecutive 15 minute periods with the highest total volume when all movements are added together. Thus, the weekday evening peak hour at one intersection may be 4:45 PM to 5:45 PM if those four consecutive 15 minute periods have the highest combined volume. Intersection turning movement count worksheets are provided in Appendix B.

Figure 12 and Figure 13 show the Existing morning peak hour and evening peak hour intersection turning movement volumes, respectively.

E. Existing Intersection Capacity Utilization/Delay and Level of Service

The Intersection Capacity Utilization/delay and Levels of Service for Existing traffic conditions have been calculated and are shown in Table 1. Existing Level of Service worksheets are provided in Appendix C.

As shown in Table 1, the study intersections currently operate within acceptable Levels of Service (D or better) during the peak hours for Existing traffic conditions.

Table 1

Existing Intersection Capacity Utilization/Delay and Levels of Service

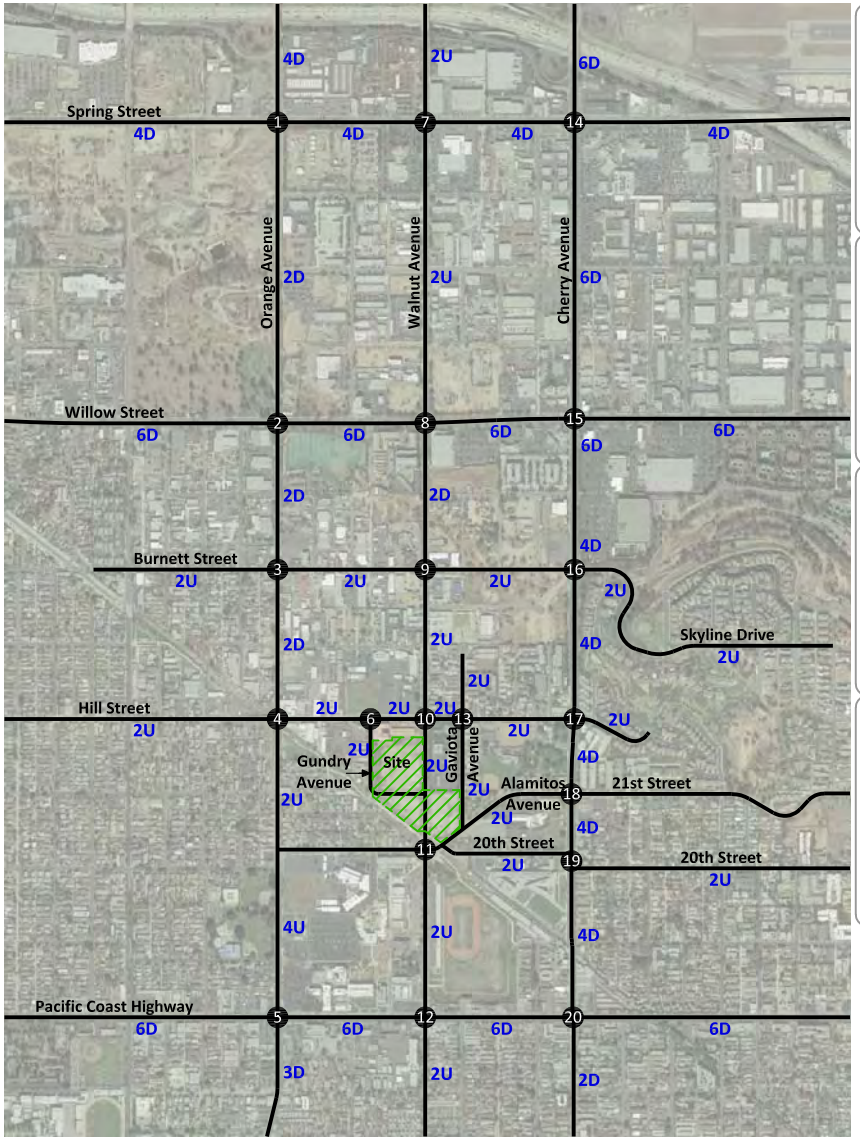
Intersection	Traffic Control[1]	Intersection Approach Lanes[2]												Peak Hour V/C [Delay]-LOS[3]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Orange Avenue (NS) at:															
Spring Street (EW) - #1	TS	1	2	1	1	1	1	1	2	d	1	2	d	0.791-C	0.812-D
Willow Street (EW) - #2	TS	1	1	1	1	1	1	1	2.5	0.5	1	2.5	0.5	0.733-C	0.846-D
Burnett Street (EW) - #3	TS	1	1	d	1	1	d	-	<1>	-	-	<1>	-	0.633-B	0.608-B
Hill Street (EW) - #4	TS	1	0.5	0.5	1	0.5	0.5	0.5	0.5	1	0.5	0.5	d	0.704-C	0.632-B
Pacific Coast Highway (EW) - #5	TS	1	2	1>	1	2	1	1	2.5	0.5	1	2.5	0.5	[23.2]-C	[21.4]-C
Gundry Avenue (NS) at:															
Hill Street (EW) - #6	CSS	0.5	-	0.5	-	-	-	-	0.5	0.5	0.5	0.5	-	[12.5]-B	[11.0]-B
Walnut Avenue (NS) at:															
Spring Street (EW) - #7	TS	1	1	d	1	0.5	0.5	1	1.5	0.5	1	1.5	0.5	0.621-B	0.656-B
Willow Street (EW) - #8	TS	1	1.5	0.5	1	2	d	1	2.5	0.5	1	2.5	0.5	0.508-A	0.650-B
Burnett Street (EW) - #9	AWS	0.5	0.5	d	0.5	0.5	d	-	<1>	-	-	<1>	-	[14.9]-B	[13.3]-B
Hill Street (EW) - #10	AWS	-	<1>	-	0.5	0.5	1	-	<1>	-	-	<1>	-	[12.2]-B	[11.9]-B
20th Street/Alamitos Avenue (EW) - #11	TS	1	0.5	0.5	1	0.5	0.5	-	<1>	-	-	<1>	-	0.541-A	0.493-A
Pacific Coast Highway (EW) - #12	TS	-	<1>	-	-	<1>	-	1	2.5	0.5	1	2.5	0.5	[9.0]-A	[9.1]-A
Gaviota Avenue (NS) at:															
Hill Street (EW) - #13	CSS	-	<1>	-	-	<1>	-	-	<1>	-	-	<1>	-	[11.5]-B	[12.2]-B
Cherry Avenue (NS) at:															
Spring Street (EW) - #14	TS	1	2.5	0.5	2	2.5	0.5	1	2.5	0.5	1	2.5	1.5	0.751-C	0.729-C
Willow Street (EW) - #15	TS	1	3	1>	2	2.5	0.5	2	2.5	0.5	2	2.5	0.5	0.714-C	0.853-D
Burnett Street (EW) - #16	TS	1	2	1	1	2	1	-	<1>	-	0.5	0.5	1	0.624-B	0.608-B
Hill Street (EW) - #17	TS	1	2	d	1	2	1	-	<1>	-	-	<1>	-	0.591-A	0.626-B
21st Street (EW) - #18	TS	1	2	d	1	2	1	0.5	0.5	d	1	0.5	0.5	0.653-B	0.593-A
20th Street (EW) - #19	TS	1	1.5	0.5	1	1.5	0.5	1	0.5	0.5	-	<1>	-	0.525-A	0.491-A
Pacific Coast Highway (EW) - #20	TS	1	1.5	0.5	1	2	1>	1	2.5	0.5	1	2.5	0.5	[28.2]-C	[25.2]-C

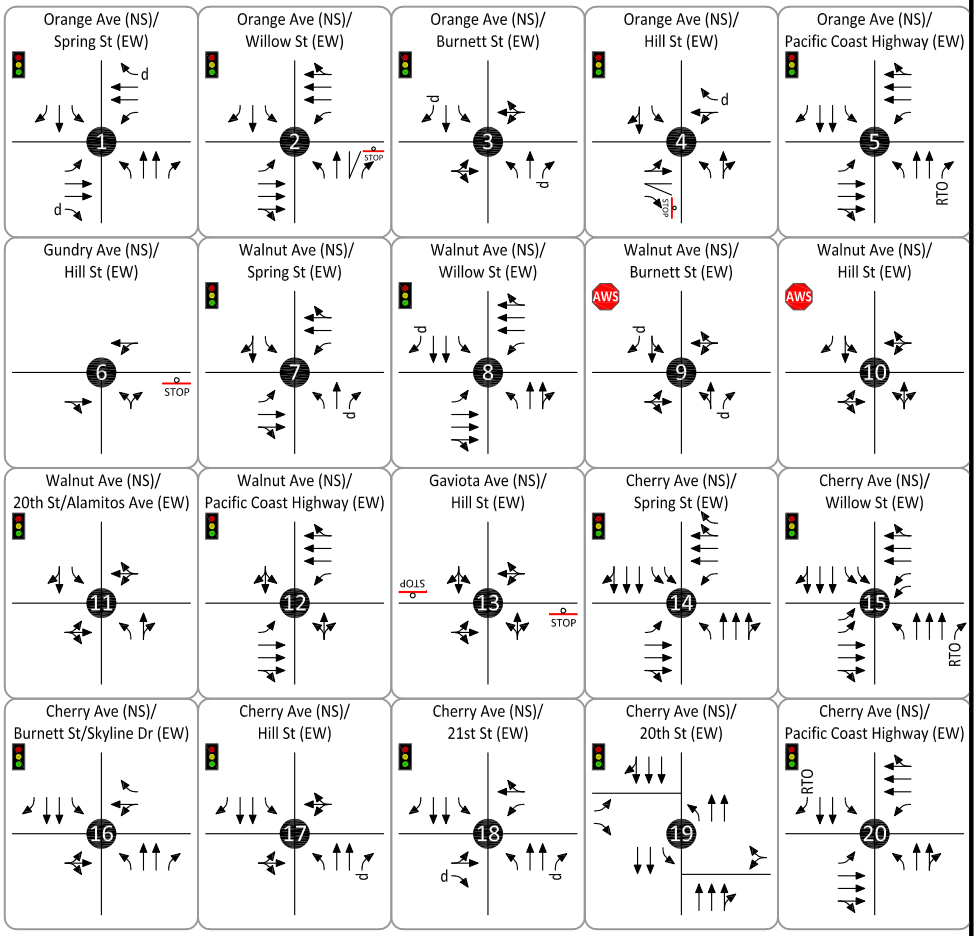
[1] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

[2] L = Left; T = Through; R = Right; d = De Facto Right Turn Lane; <1> = Shared Left/Through/Right Lane; > = Right Turn Overlap

[3] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; [Delay]-LOS is reported for intersections under California Department of Transportation jurisdiction and intersections with stop control. Per the Highway Capacity Manual, overall average intersection delay and LOS are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, Level of Service is based on average delay of the worst individual lane (or movements sharing a lane).

Figure 3
Existing Lane Geometry and Intersection Traffic Controls

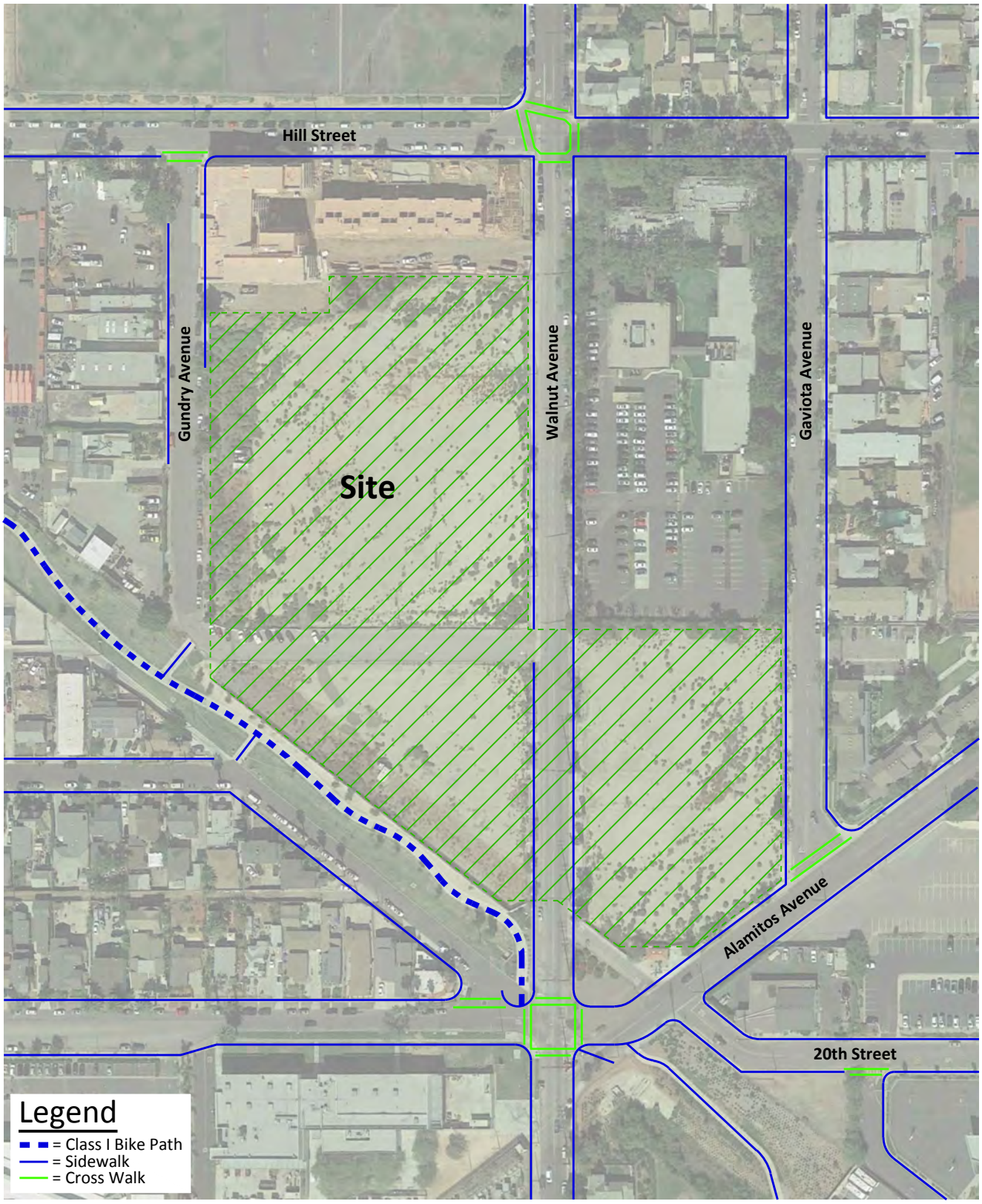




Legend

= Traffic Signal
= All Way Stop
= Stop Sign
#D = #-Lane Divided Roadway
#U = #-Lane Undivided Roadway
= Existing Lane
RTO = Right Turn Overlap
d = De Facto Right Turn Lane

Figure 4
Existing Bicycle & Pedestrian Facilities

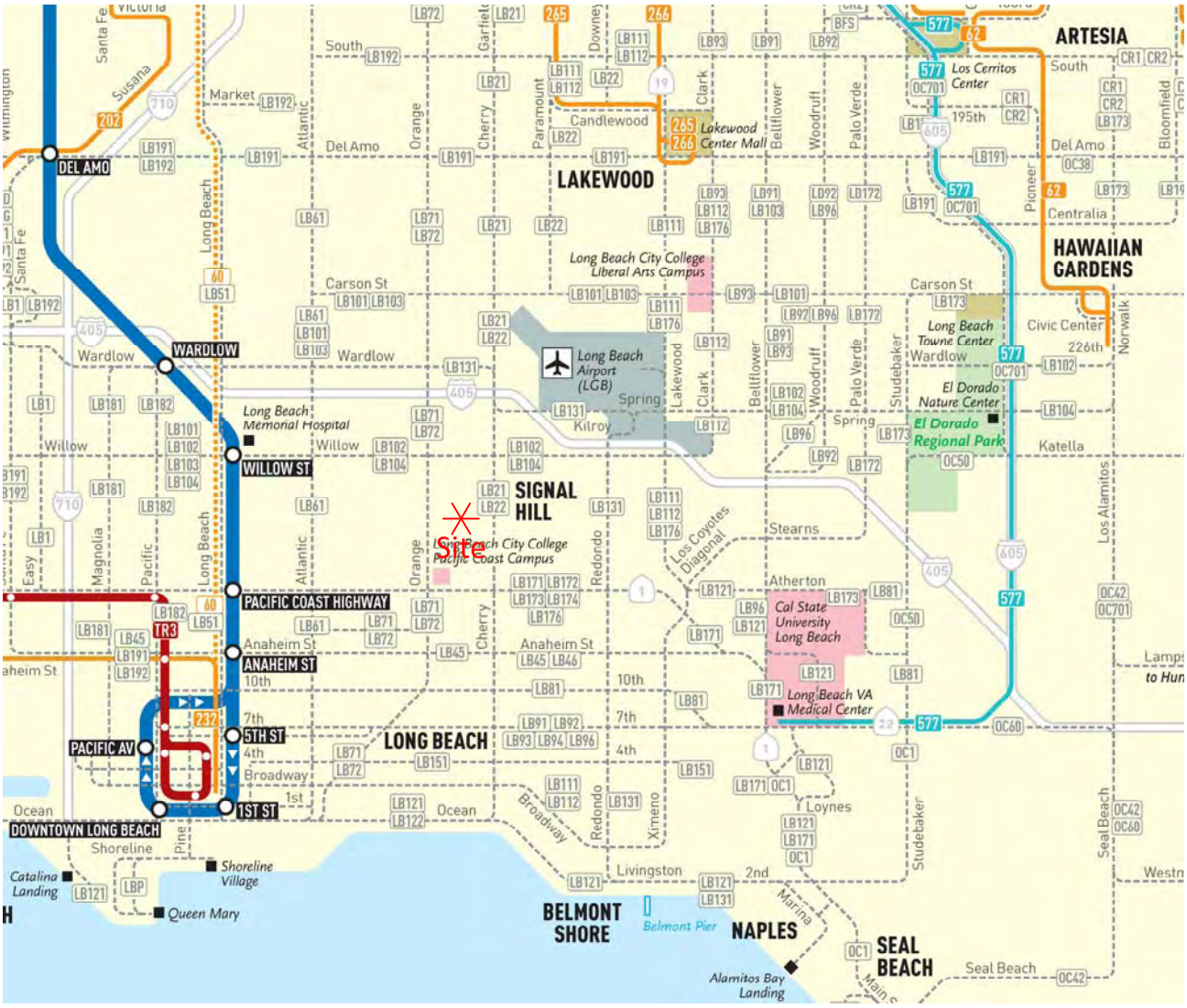


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Figure 5
Long Beach Transit System Map

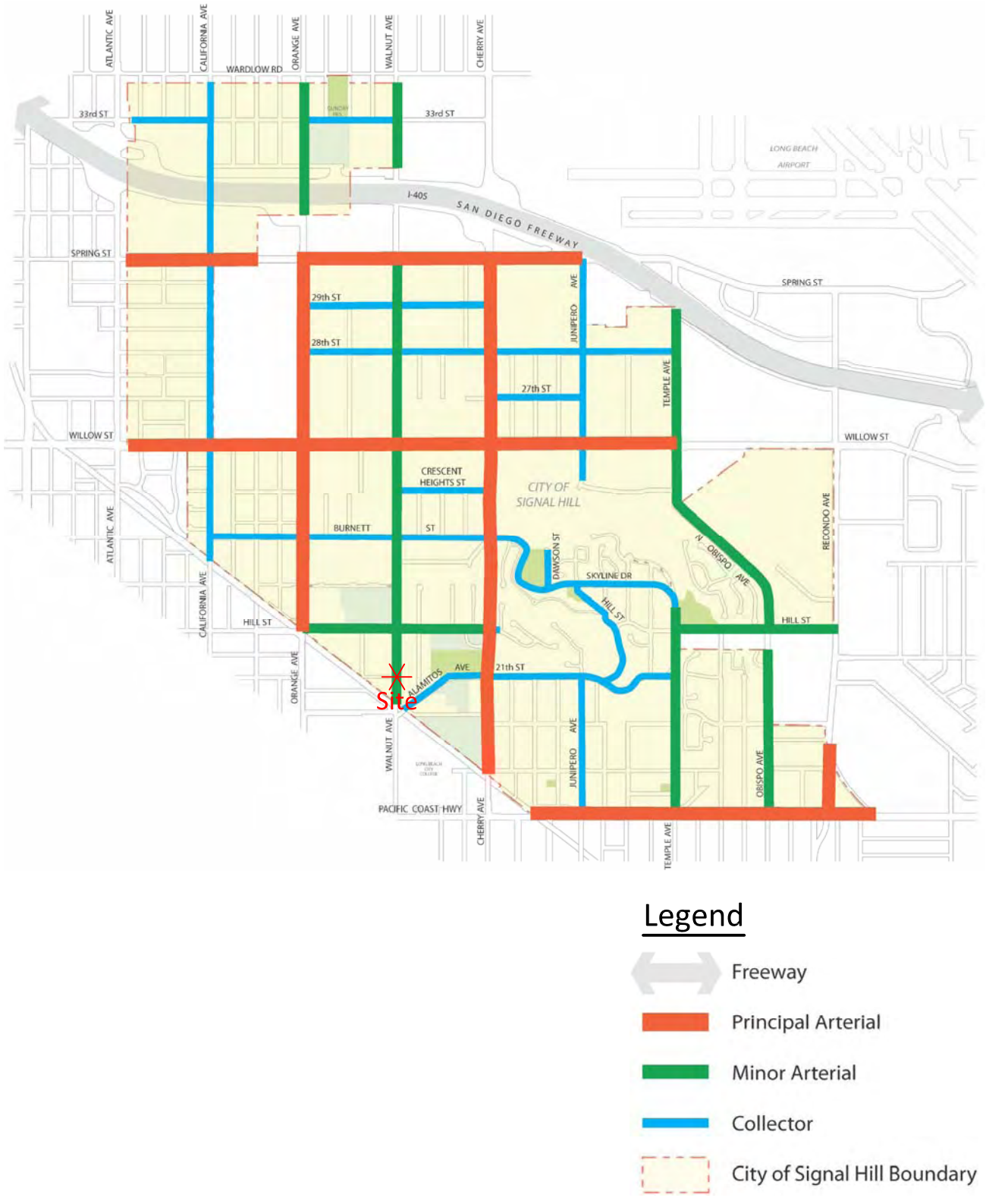


Legend

Metro Local or Limited Line	81	Metro Express Line	460
Metro Late-Night or Owl Service	78	Metro Rapid Line & Stop	740
Metro Shuttle Line	665	Municipal Bus Line	M10
Metro Rail Line & Station		Metro Rail Station & Entrance (Downtown LA)	
Transfers			
Metro Busway & Station			
		Metro Silver Line Street Stop	
Metrolink Station	ML	Metro Customer Center	
Amtrak Station	AM	Tourist Attraction/ Sports Venue	
Greyhound	GR	Shopping Area	
FlyAway	FA	School/College/University	
Megabus	MB	Point of Interest	
Interstate Freeway	210	Airport/Civic/Government	
US Freeway	101	Park	
State Highway or Freeway	134		

Source: L.A. Metro

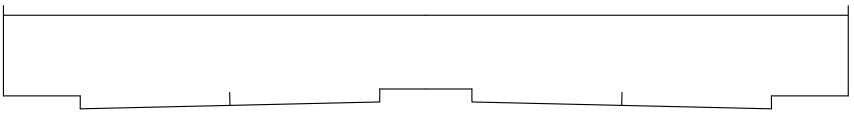
Figure 6
City of Signal Hill General Plan Circulation Element



Source: City of Signal Hill

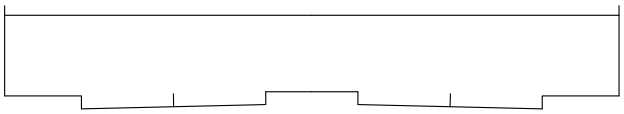
Figure 7
City of Signal Hill General Plan Roadway Cross-Sections

Principal Arterial



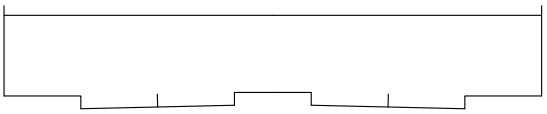
100-110' ROW; four travel lanes with painted or raised median.

Minor Arterial



80' ROW; four travel lanes with painted median.

Collector Street



60-70' ROW; two travel lanes and two parking lanes.
May include a painted median.

Local Street



60' ROW; two travel lanes and two parking lanes.
Reduced width for some private streets.

Alleys

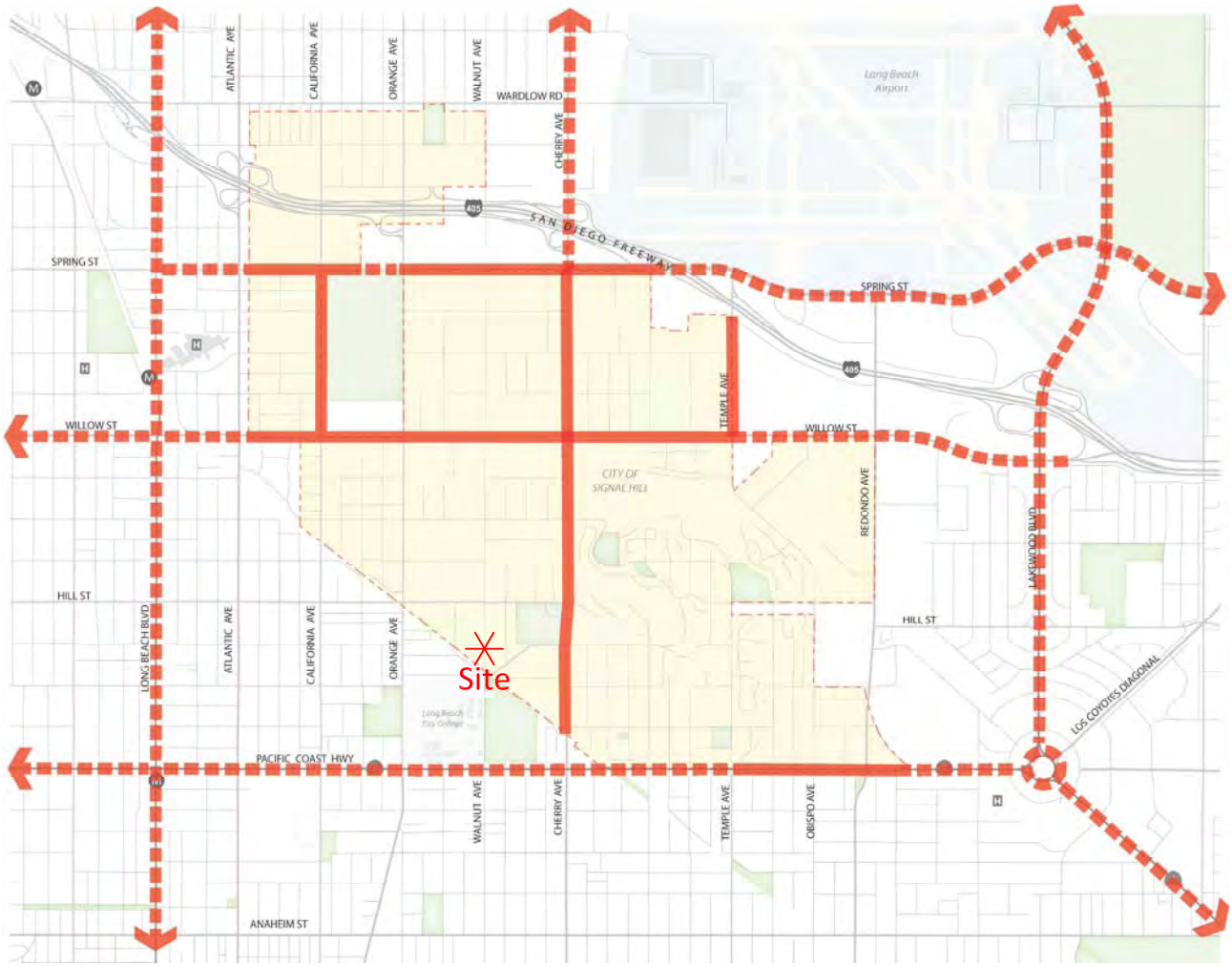


20' ROW; varies in some neighborhoods,
with narrower widths permitted in some areas.

*Interstate: Varies (Caltrans ownership).

Source: City of Signal Hill

Figure 8
City of Signal Hill Truck Routes

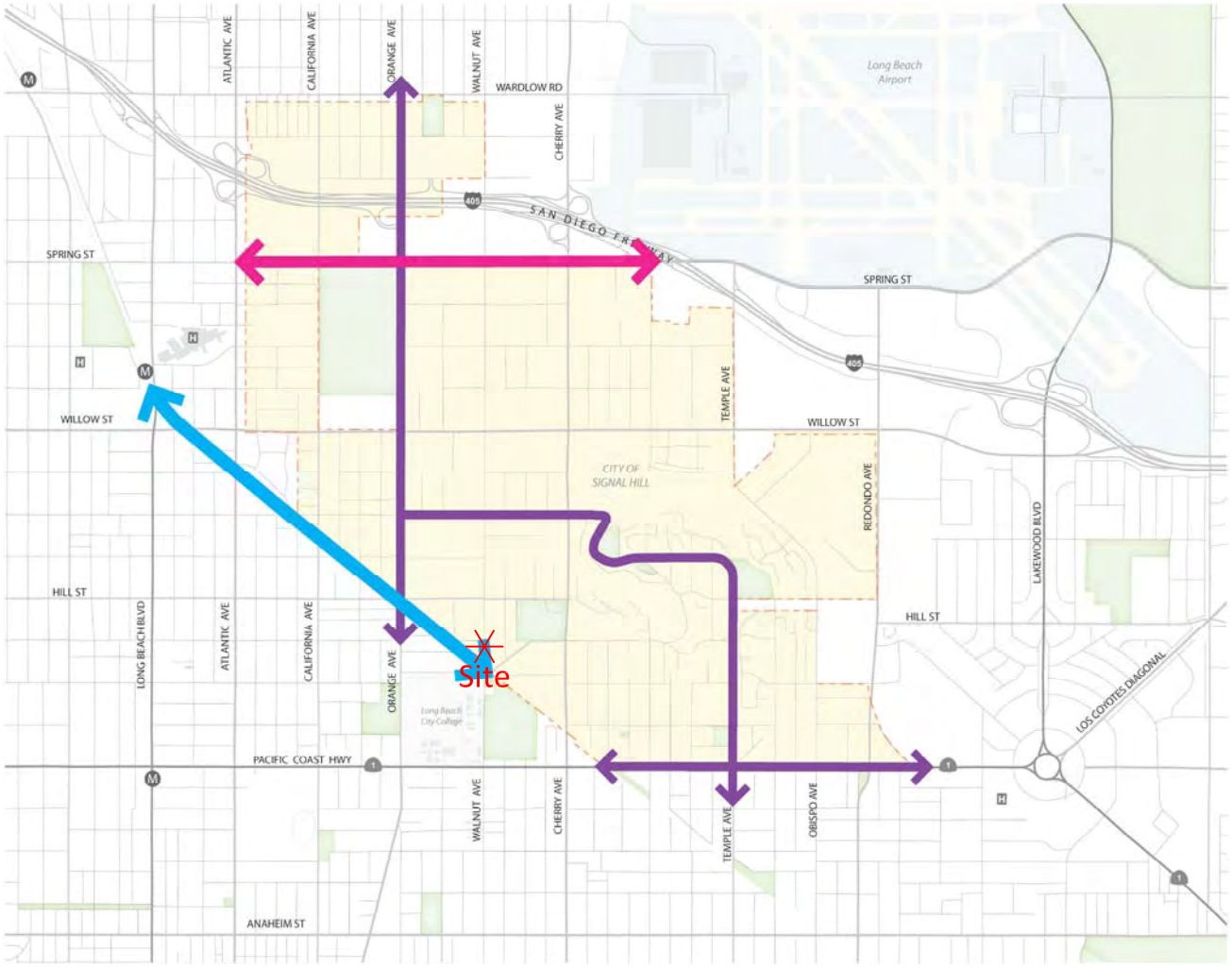


Legend

- Signal Hill Truck Route
- Long Beach Truck Route
- City of Signal Hill Boundary
- Park/Open Space
- Metro Station
- Hospital

Source: City of Signal Hill

Figure 9
City of Signal Hill Bikeway Master Plan

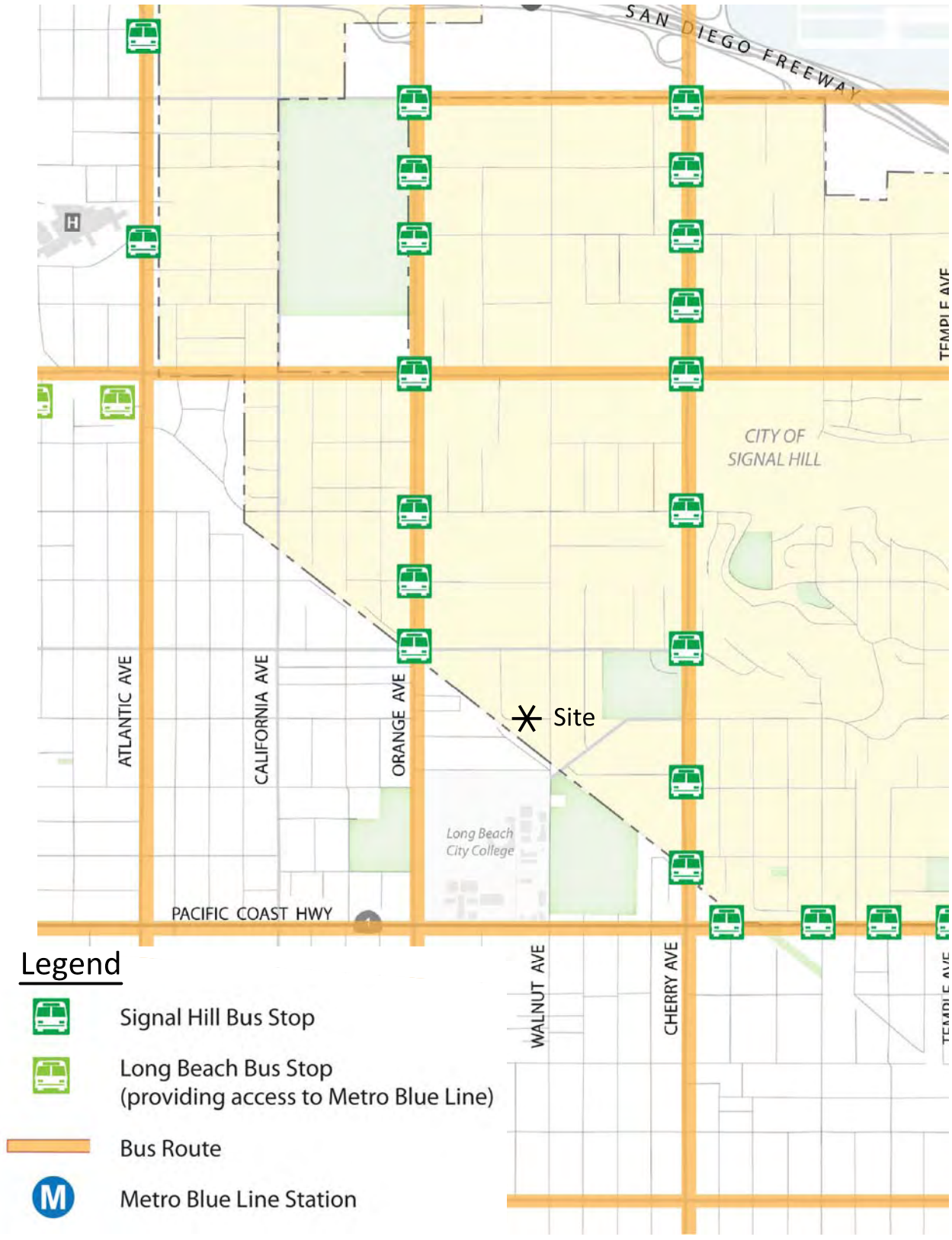


Legend

- Class I Bike Path
- Class II Bike Lane
- Class III Bike Route
- City of Signal Hill Boundary

Source: City of Signal Hill

Figure 10
City of Signal Hill Bus & Light Rail Routes

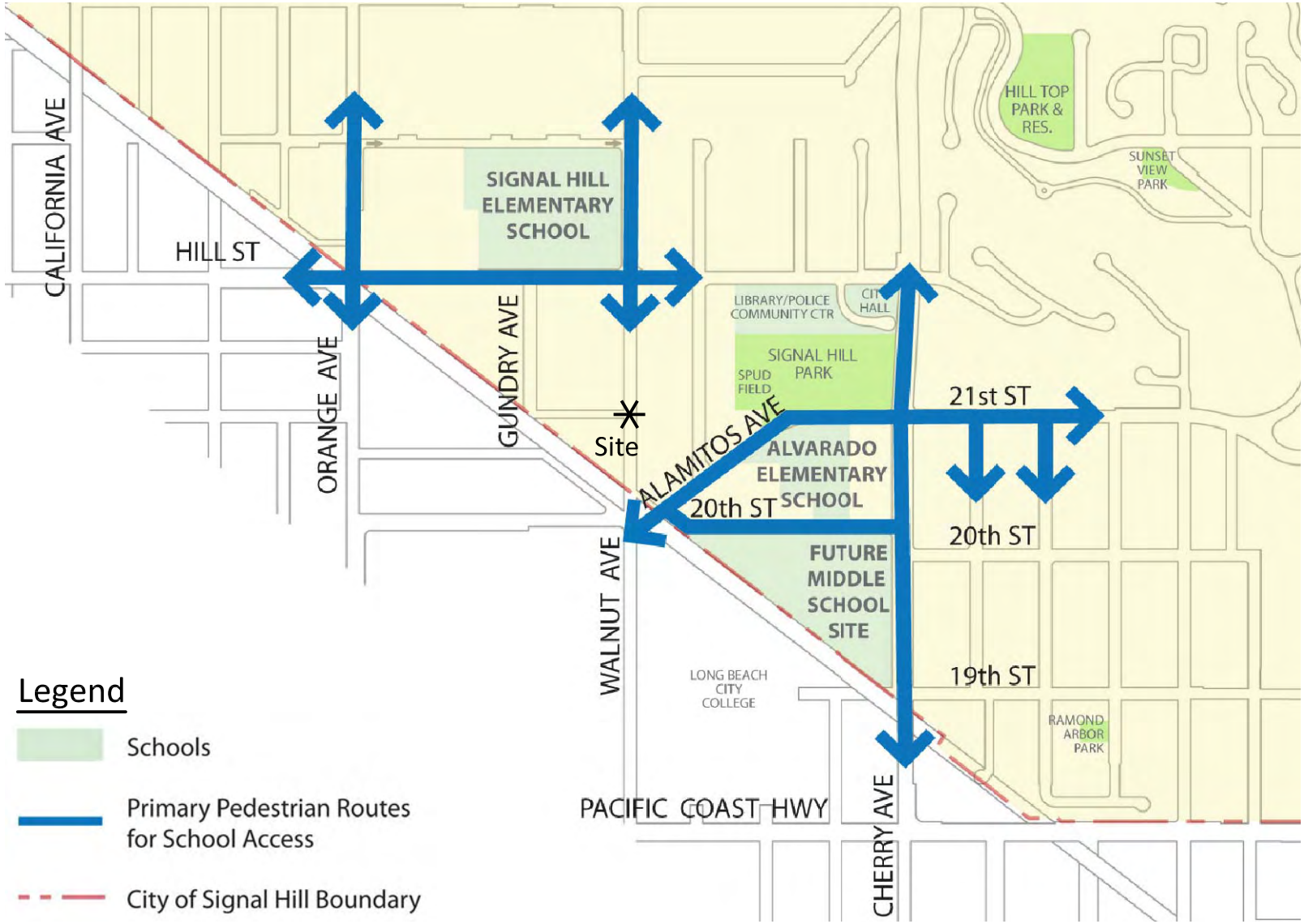


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Source: City of Signal Hill

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Figure 11
City of Signal Hill Schools And Primary Pedestrian Access Routes



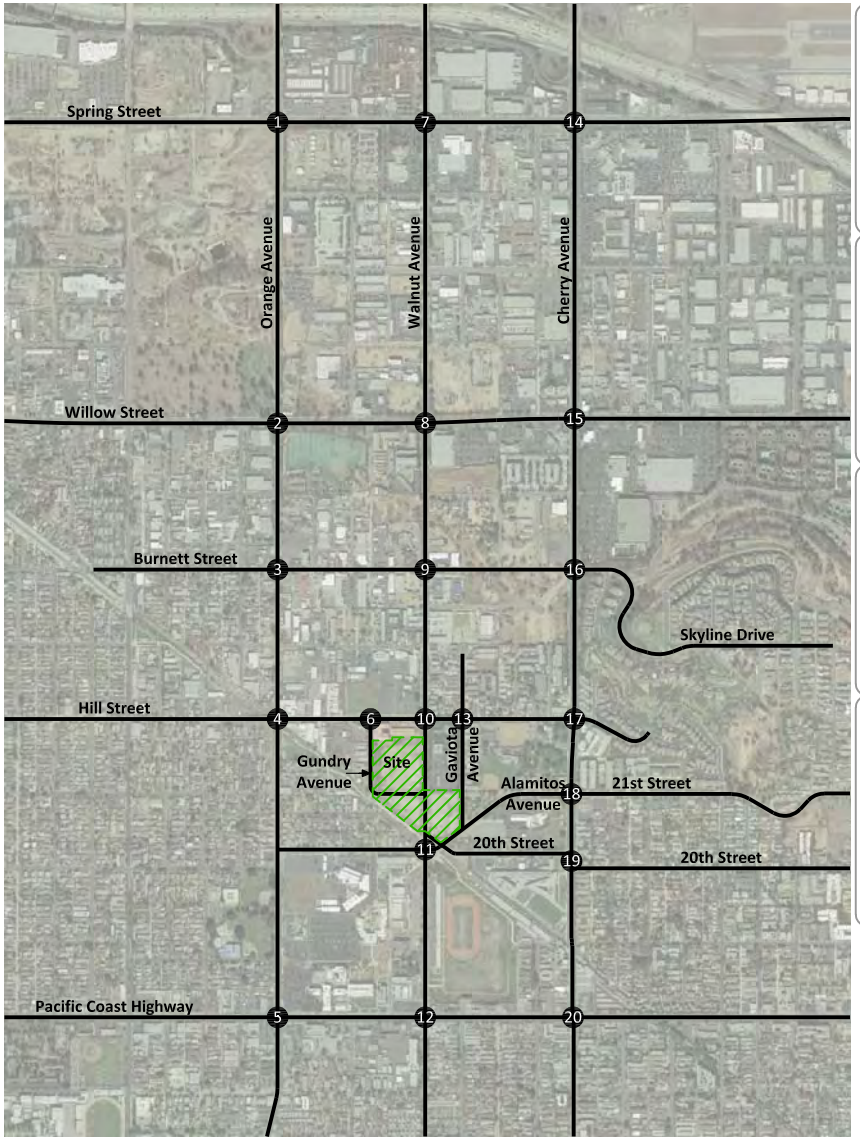
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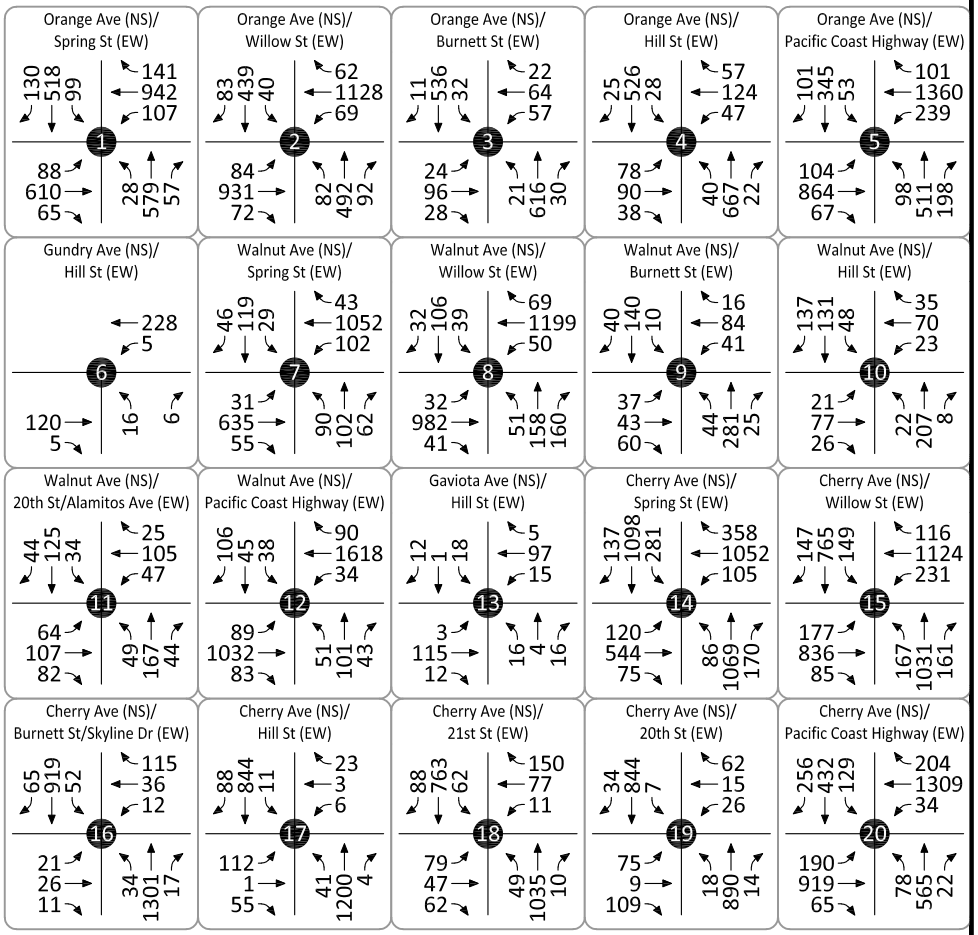
Source: City of Signal Hill

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Figure 12
Existing Morning Peak Hour Intersection Turning Movement Volumes





Legend

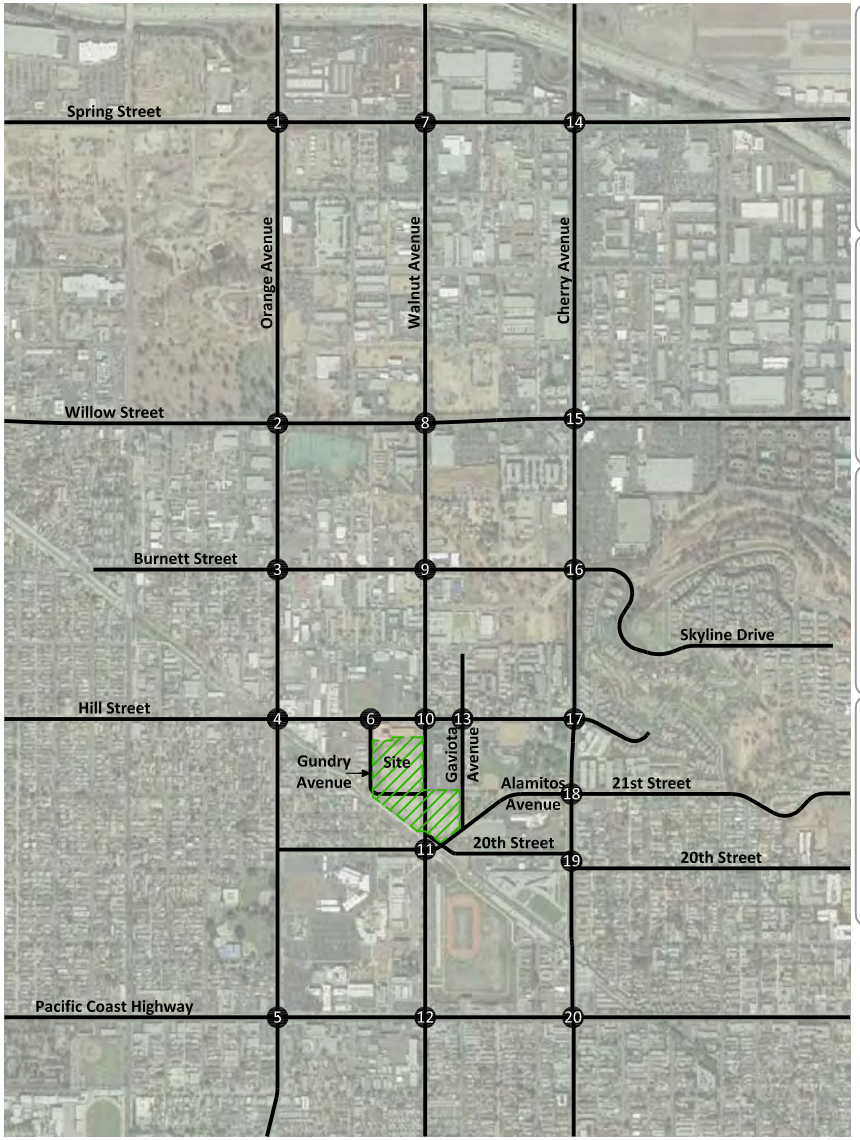
1 = Intersection Reference Number

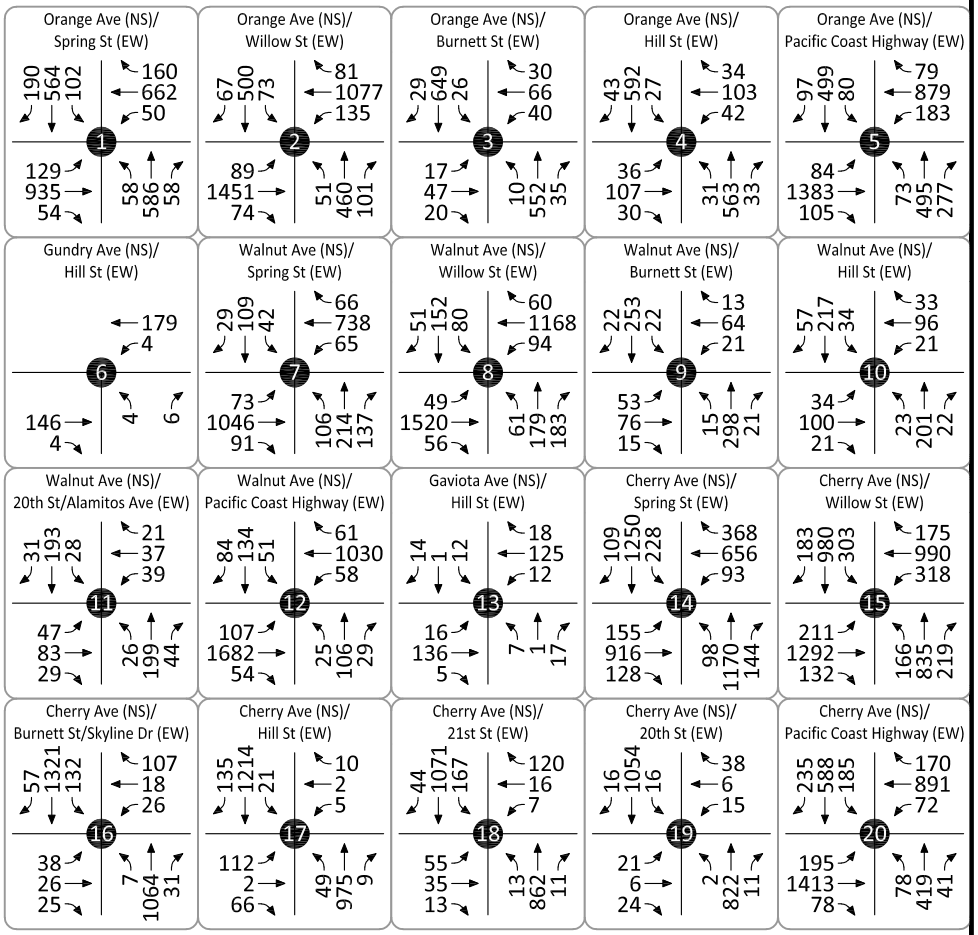
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Figure 13
Existing Evening Peak Hour Intersection Turning Movement Volumes





Legend

1 = Intersection Reference Number

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IV. PROJECT TRIPS

A. Trip Generation

Table 2 shows the project trip generation based upon regression/linear equations obtained from the Institute of Transportation Engineers, Trip Generation Manual, 10th Edition, 2017. Trip generation equations for the Business Park land use (Land Use Code 770) were used, which the Institute of Transportation Engineers describes as the following:

> "A business park consists of a group of flex-type or incubator one- or two-story buildings served by a common roadway system. The tenant space is flexible and lends itself to a variety of uses; the rear side of the building is usually served by a garage door. Tenants may be start-up companies or small mature companies that a require a variety of space. The space may include offices, retail and wholesale stores, restaurants, recreational areas and warehousing, manufacturing, light industrial, or scientific research functions. The average mix is 20 to 30 percent office/commercial and 70 to 80 percent industrial/warehousing."

In accordance with the Institute of Transportation Engineers recommendations, the number of trips forecast to be generated by the proposed land use are determined by solving for trips (T) in the trip generation equation given the land use quantity (X).

On average, truck trips account for approximately 13-percent of weekday trips generated by industrial park land uses[1]. To provide a conservative analysis, the project trip generation shown in Table 2 assumes trucks will comprise 15-percent of the site-generated trips. The site-generated truck trips have been converted to passenger car equivalent trips based on a factor of 2.0.

As shown in Table 2, the proposed project is forecast to generate a total of approximately 2,320 daily vehicle trips, including 212 vehicle trips during the morning peak hour and 214 vehicle trips during the evening peak hour. The proposed project is forecast to generate a total of approximately 2,668 daily trips in passenger car equivalents, including 244 passenger car equivalent trips during the morning peak hour and 246 passenger car equivalent trips during the evening peak hour.

B. Trip Distribution and Assignment

Figure 14 and Figure 16 show the forecast directional distribution patterns for the project generated passenger cars and trucks, respectively. The project trip distribution patterns are based on review of existing traffic volume data, surrounding land uses, designated truck routes, and the local and regional roadway facilities in the project vicinity.

Based on the identified project trip generation and distributions, morning and evening peak hour intersection turning movement volumes expected from the project are shown on

[1] Institute of Transportation Engineers, Trip Generation Handbook, 3rd Edition, 2017.

Figure 18 and Figure 19, respectively (in passenger car equivalent trips). Morning and evening peak hour intersection turning movement volumes of trucks (in passenger car equivalent trips) expected from the project are shown on Figure 20 and Figure 21. The morning and evening peak hour intersection turning movement volumes for the combined passenger car and truck trips expected from the project are shown on Figure 22 and Figure 23, respectively.

Project Trips at Gaviota Avenue

City of Signal Hill staff has reported citizen concerns regarding cut-through traffic on Gaviota Avenue associated with traffic diversion to avoid congestion at the intersection of Walnut Avenue and Hill Street during peak commute and school hours.

It should be noted that no project access is proposed at Gaviota Avenue. Project trips seeking to avoid the intersection of Walnut Avenue and Hill Street are more likely to use Alamitos Avenue or 20th Street than Gaviota Avenue. In other words, if project trips are seeking to avoid the intersection of Walnut Avenue and Hill Street, there are more convenient routes available that do not involve travelling on Gaviota Avenue. Therefore, the project impact of cut-through traffic on Gaviota Avenue is expected to be negligible.

Table 2

Project Trip Generation

Land Use	Source[1]	Setting[2]	Trip Generation Equations[3]	Directional Distribution	
				Inbound	Outbound
Business Park	ITE 770	GU/S			
Morning Peak Hour			Ln(T) = 0.97 Ln(X) + 0.49	85%	15%
Evening Peak Hour			Ln(T) = 0.90 Ln(X) + 0.85	26%	74%
Daily			T = 10.62 (X) + 715.67	50%	50%

Land Use/Time Period	Quantity	Units[4]	Vehicle Trips Generated		
			Total	Inbound	Outbound
Business Park	151.080	TSF			
Morning Peak Hour			212	180	32
Cars (85%)			180	153	27
Trucks (15%)			32	27	5
Evening Peak Hour			214	56	158
Cars (85%)			182	48	134
Trucks (15%)			32	8	24
Daily			2,320	1,160	1,160
Cars (85%)			1,972	986	986
Trucks (15%)			348	174	174

Time Period	PCE Factor	PCE Trips Generated[5]		
		Total	Inbound	Outbound
Morning Peak Hour				
Cars	1.0	180	153	27
Trucks	2.0	64	54	10
Total		**244**	**207**	**37**
Evening Peak Hour				
Cars	1.0	182	48	134
Trucks	2.0	64	16	48
Total		**246**	**64**	**182**
Daily				
Cars	1.0	1,972	986	986
Trucks	2.0	696	348	348
Total		**2,668**	**1,334**	**1,334**

[1] ITE = Institute of Transportation Engineers,Trip Generation Manual, 10th Edition, 2017; ### = Land Use Code

[2] GU/S = General Urban/Suburban

[3] T = Trips; X = Thousand Square Feet

[4] TSF = Thousand Square Feet

[5] PCE = Passenger Car Equivalent

Figure 14
Project Trip Distribution - Passenger Cars (Outbound)

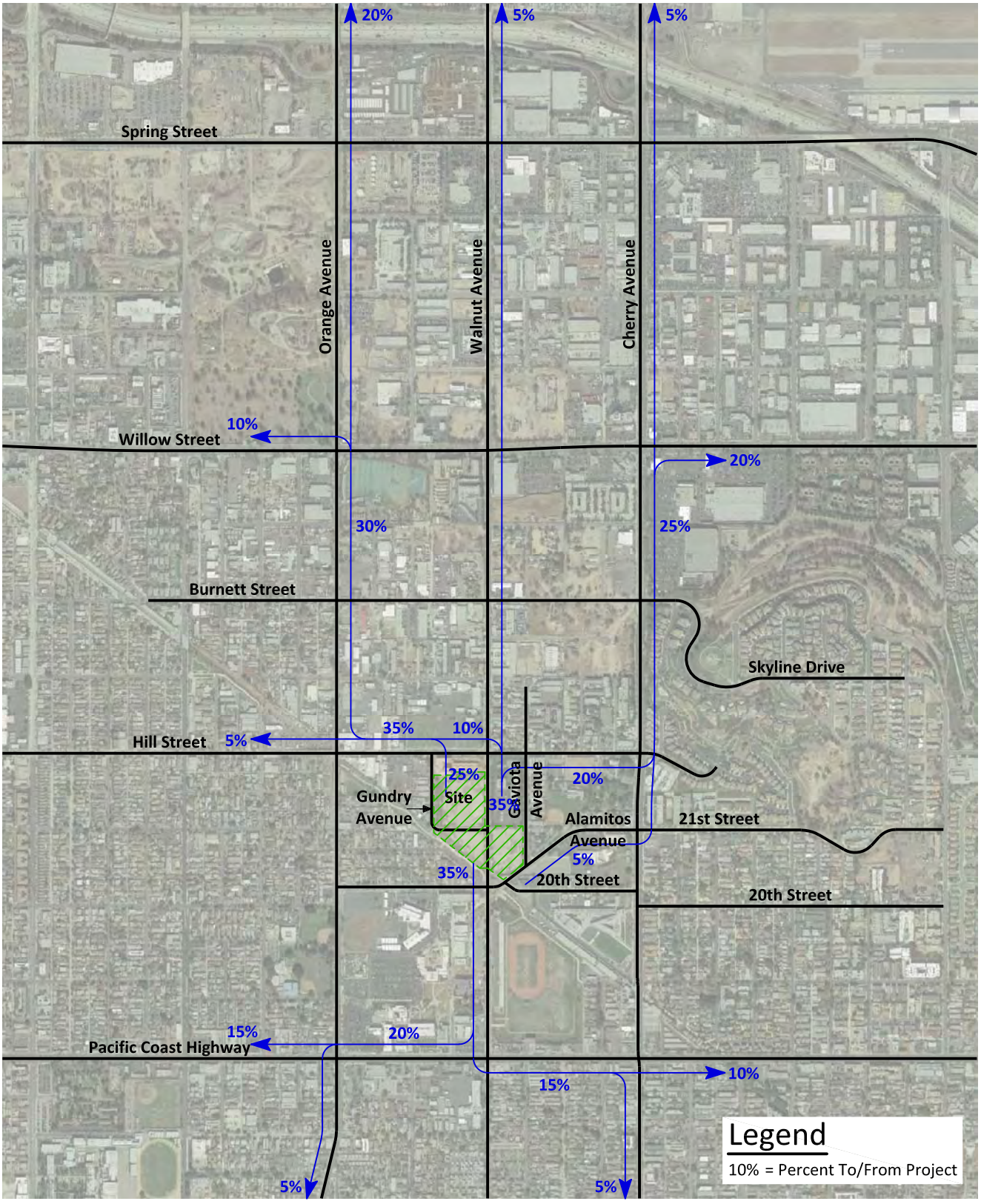


Figure 15
Project Trip Distribution - Passenger Cars (Inbound)

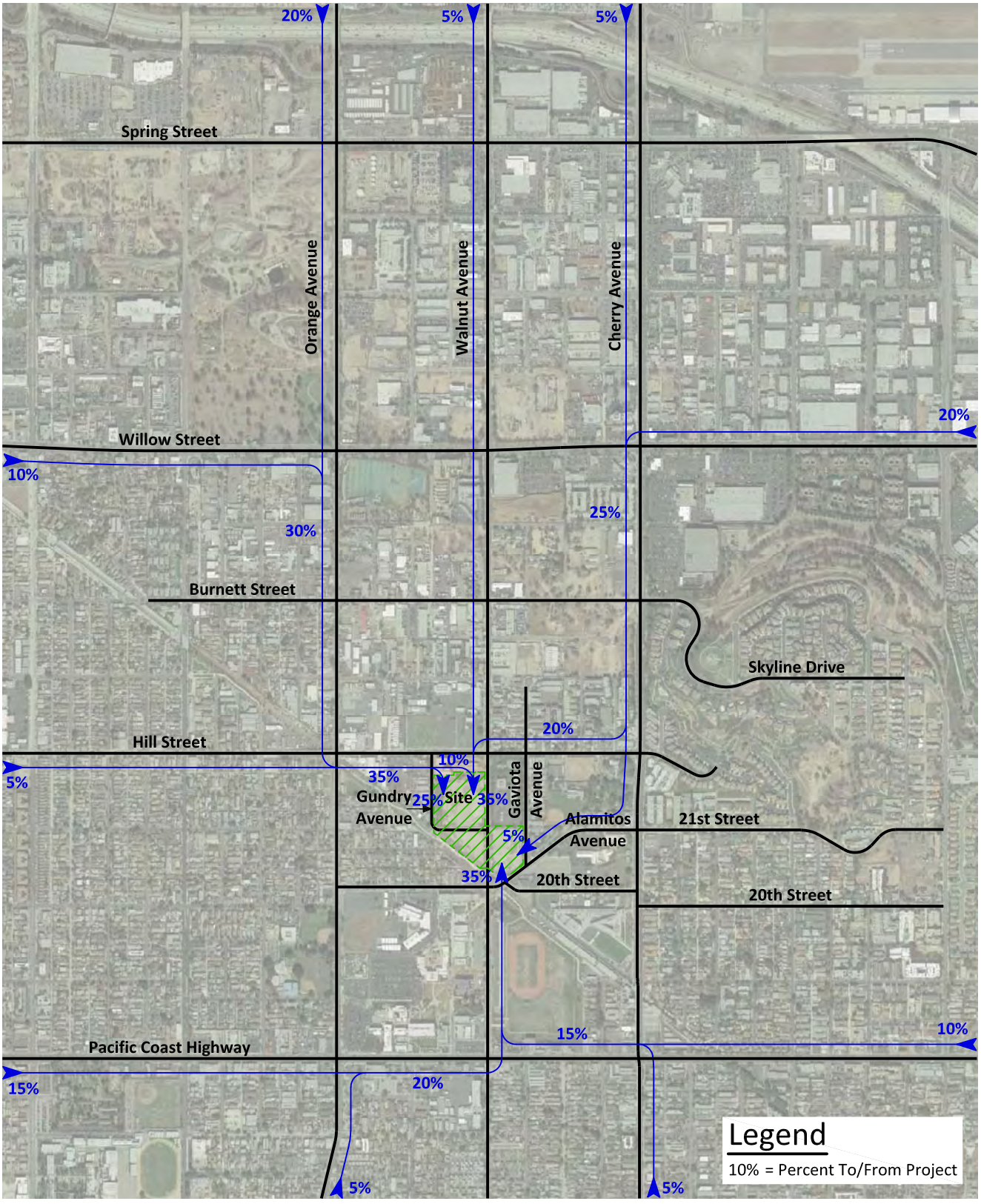


Figure 16
Project Trip Distribution - Trucks (Outbound)

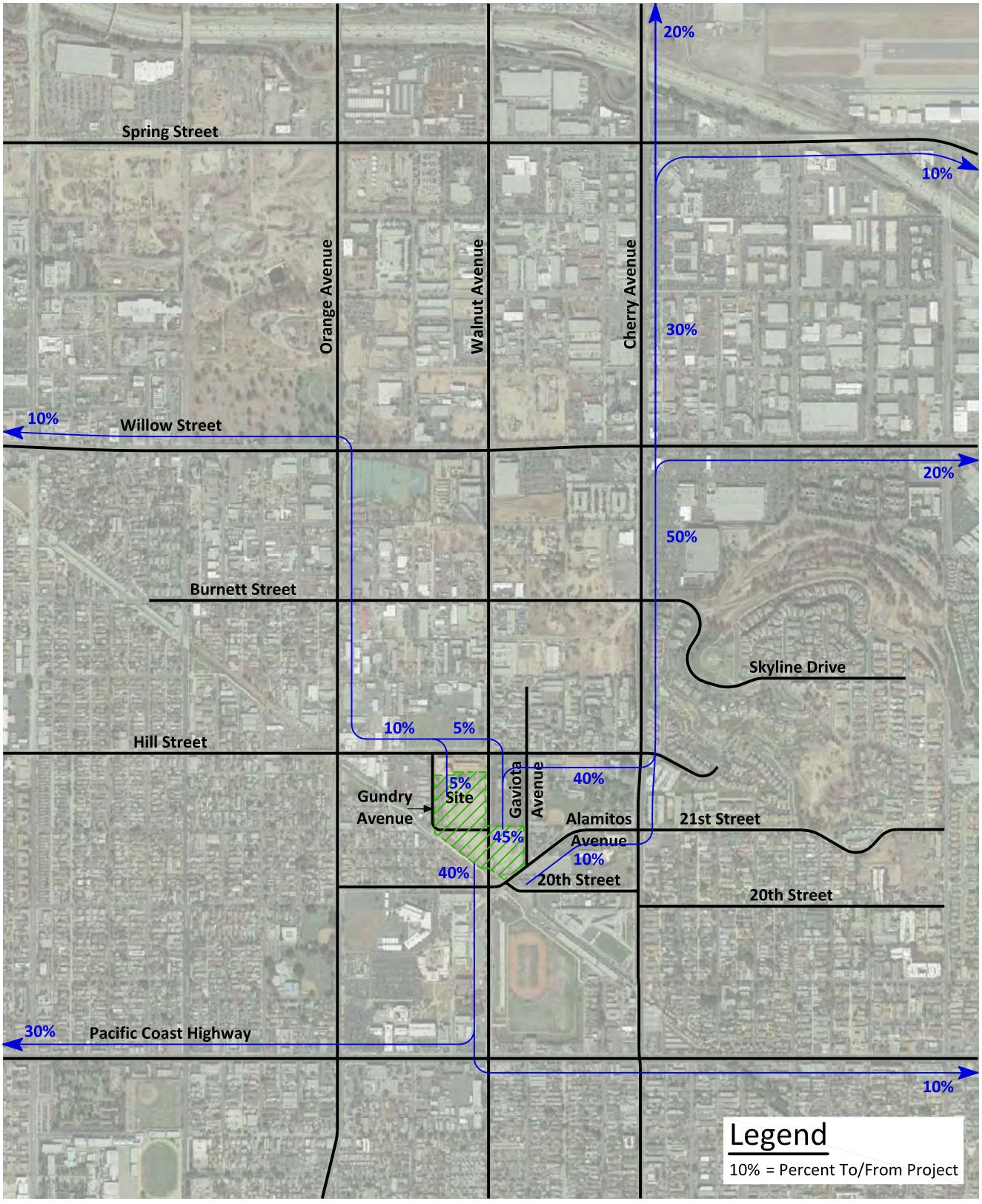
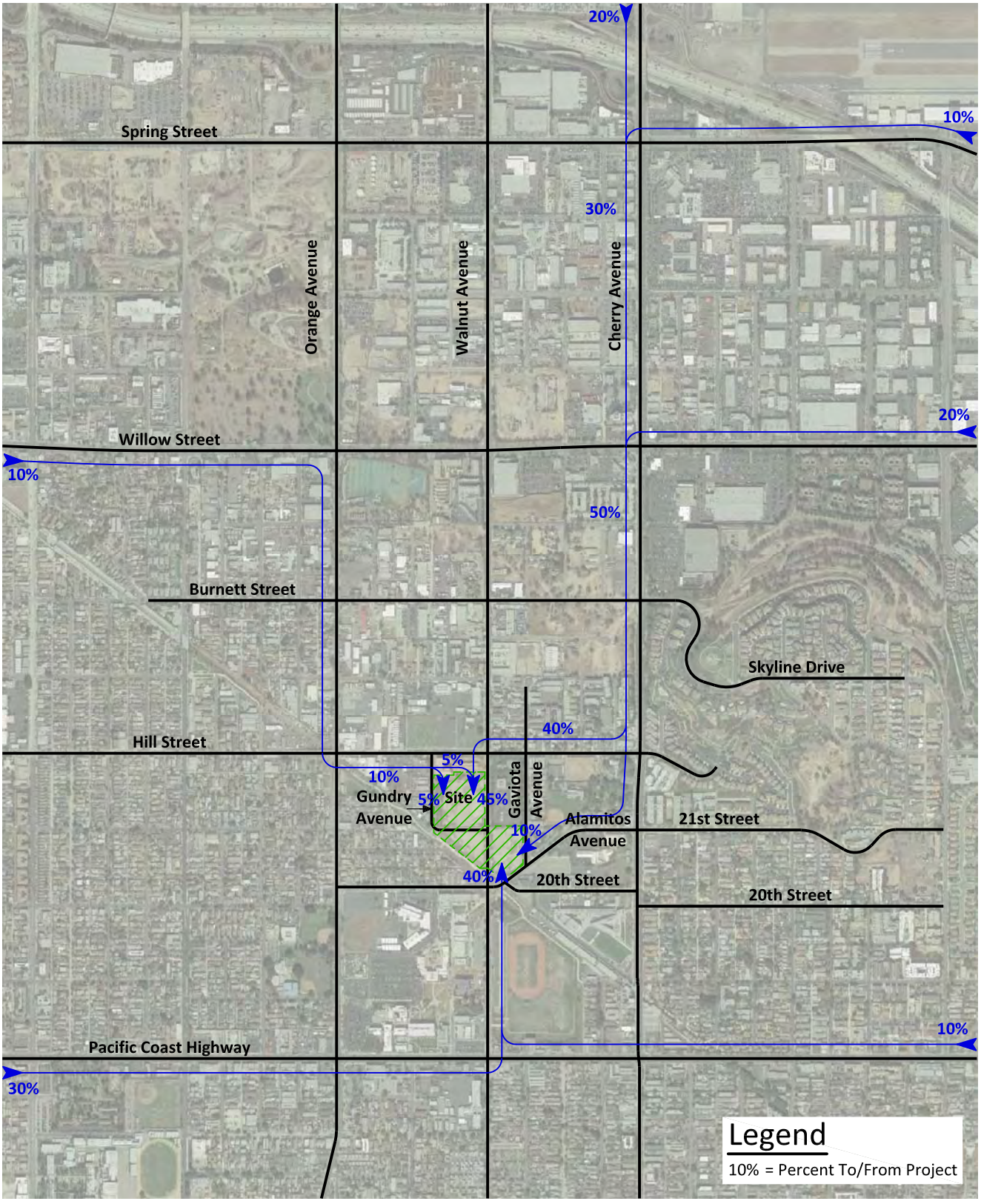


Figure 17
Project Trip Distribution - Trucks (Inbound)

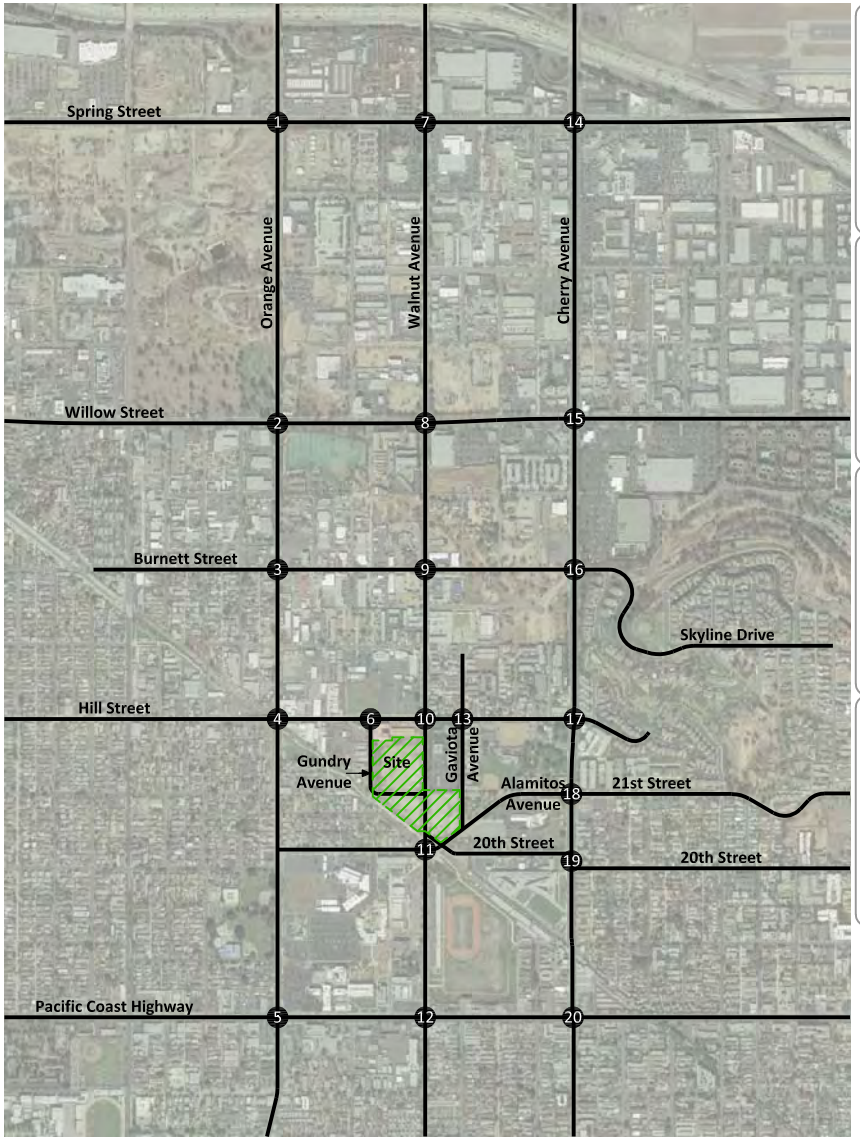


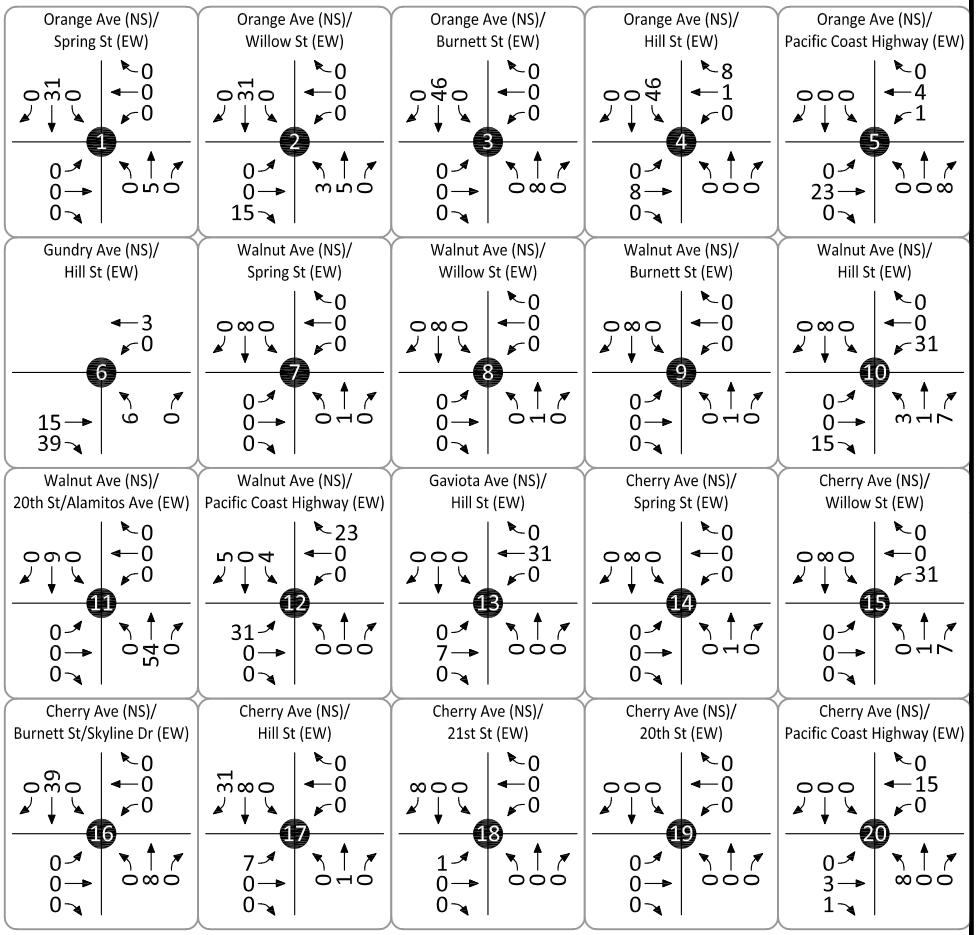
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Figure 18
Project Passenger Cars Morning Peak Hour Intersection Turning Movement Volumes





Legend

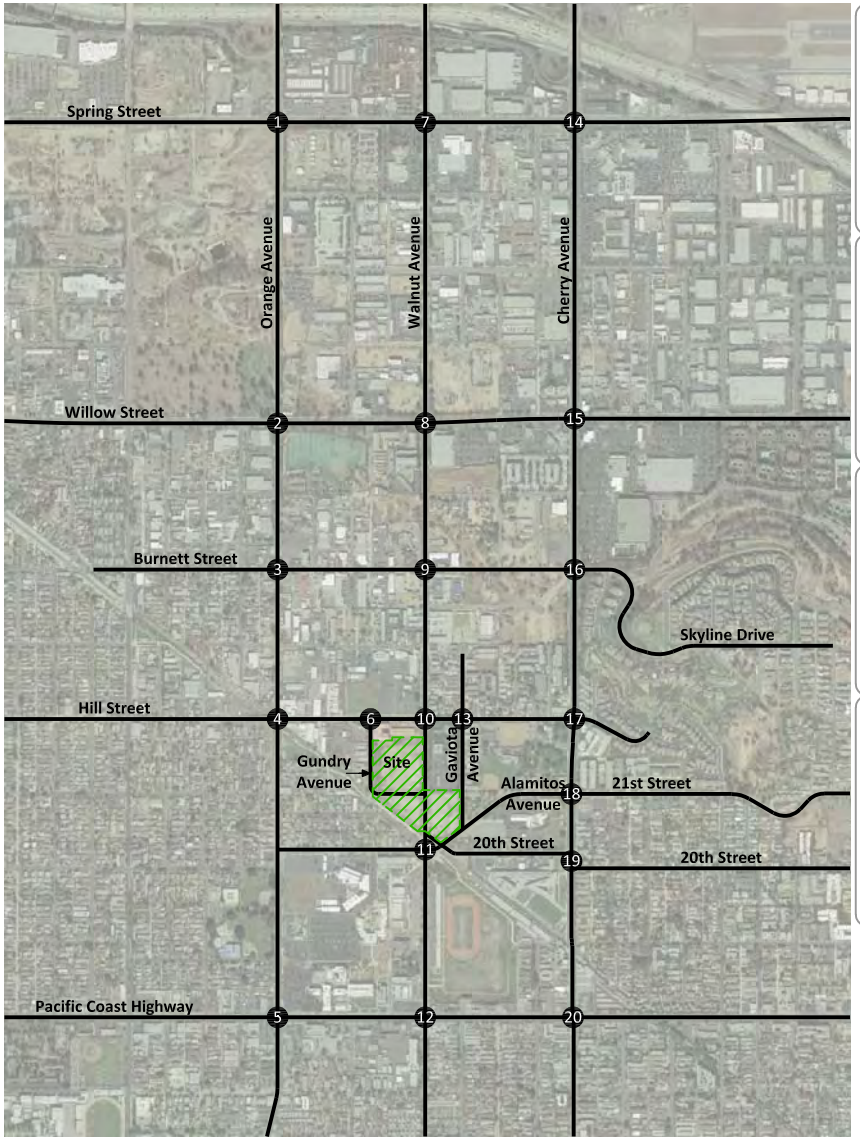
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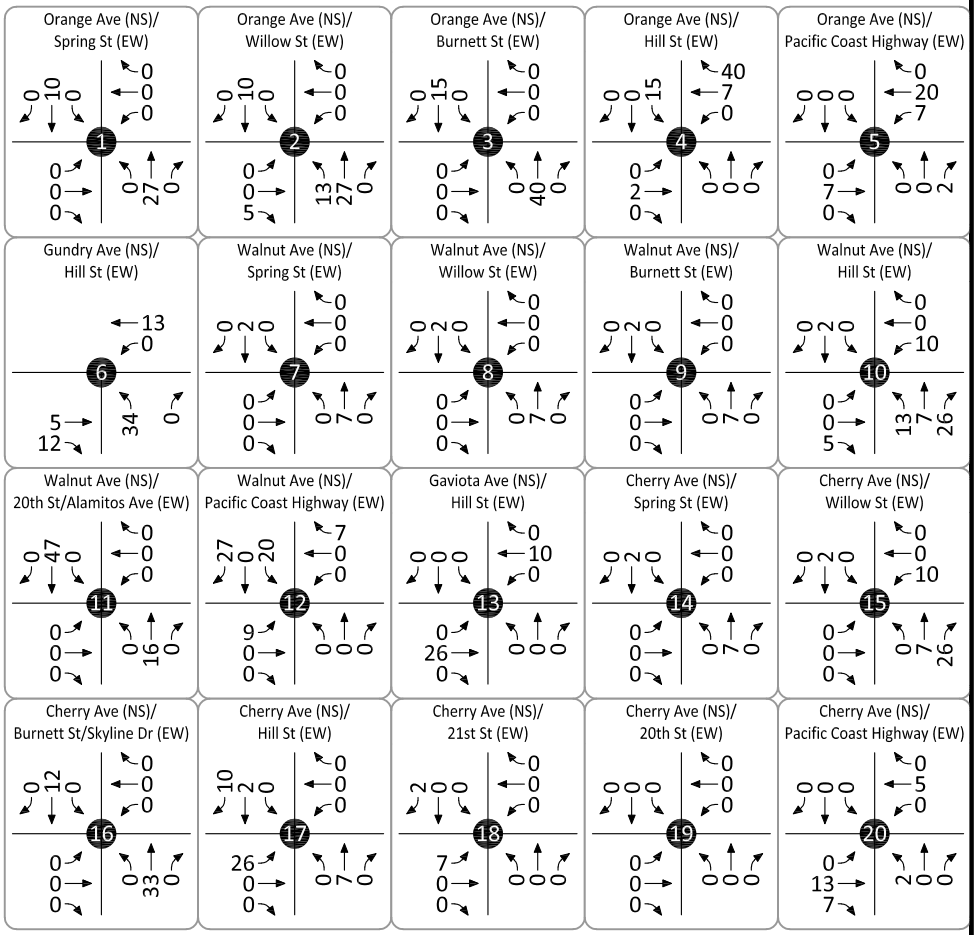
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Figure 19
Project Passenger Cars Evening Peak Hour Intersection Turning Movement Volumes





Legend

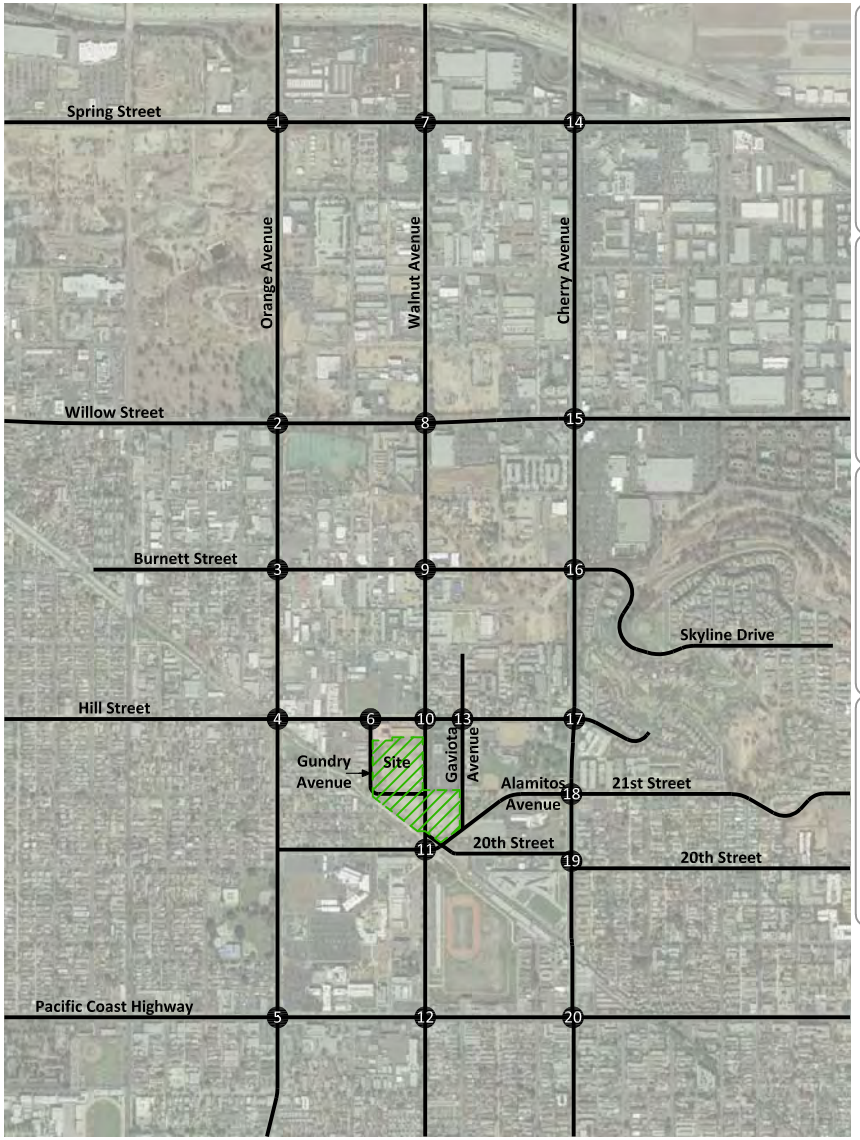
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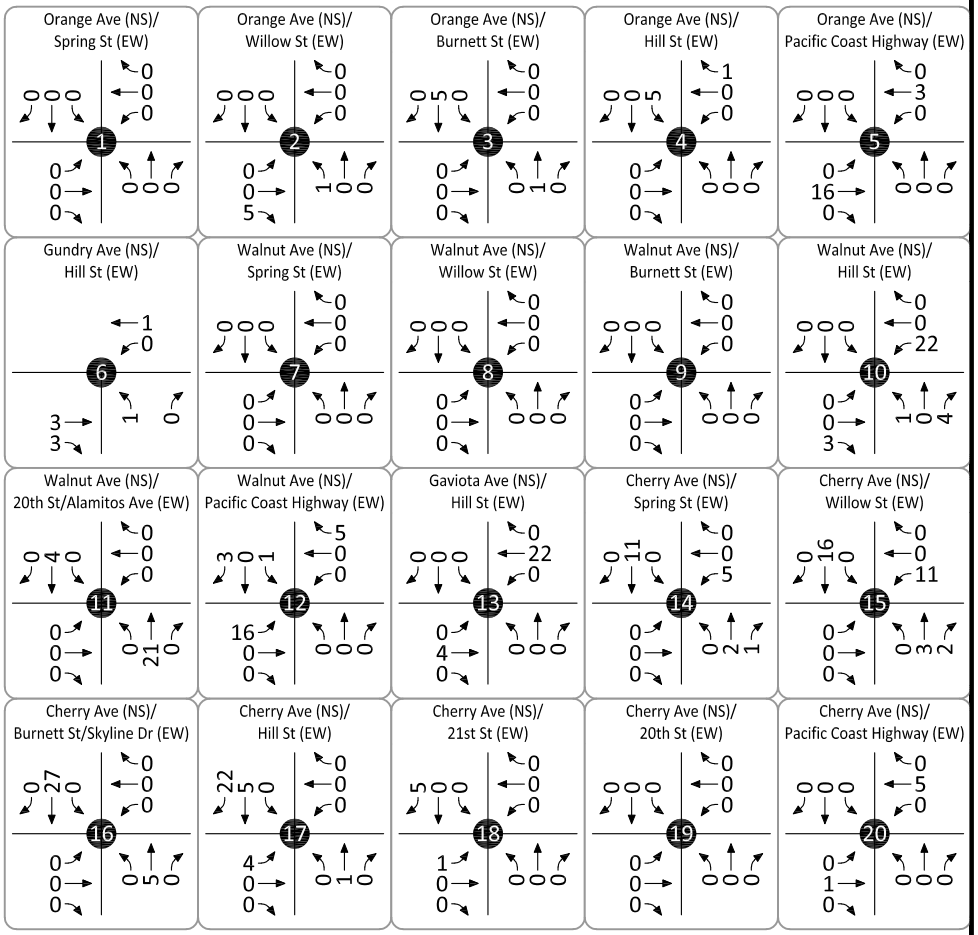
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Figure 20
Project Trucks (in PCE) Morning Peak Hour Intersection Turning Movement Volumes





Legend

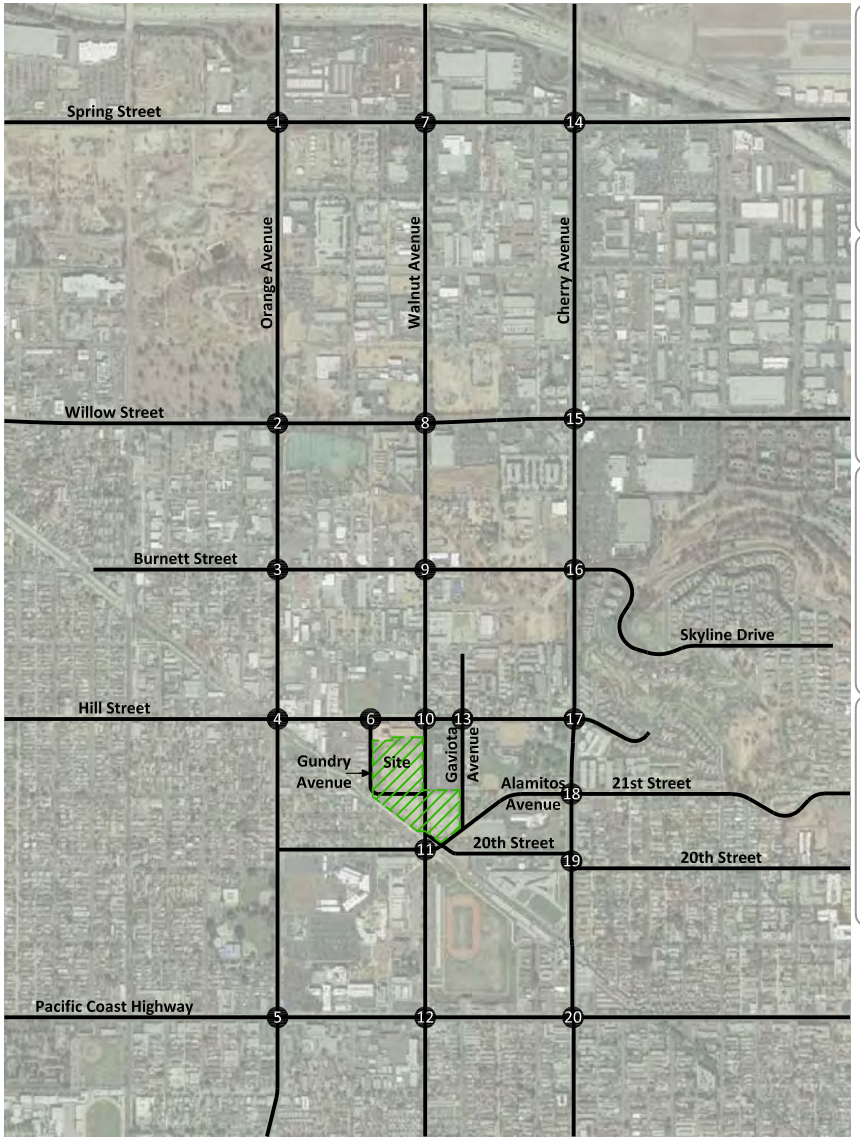
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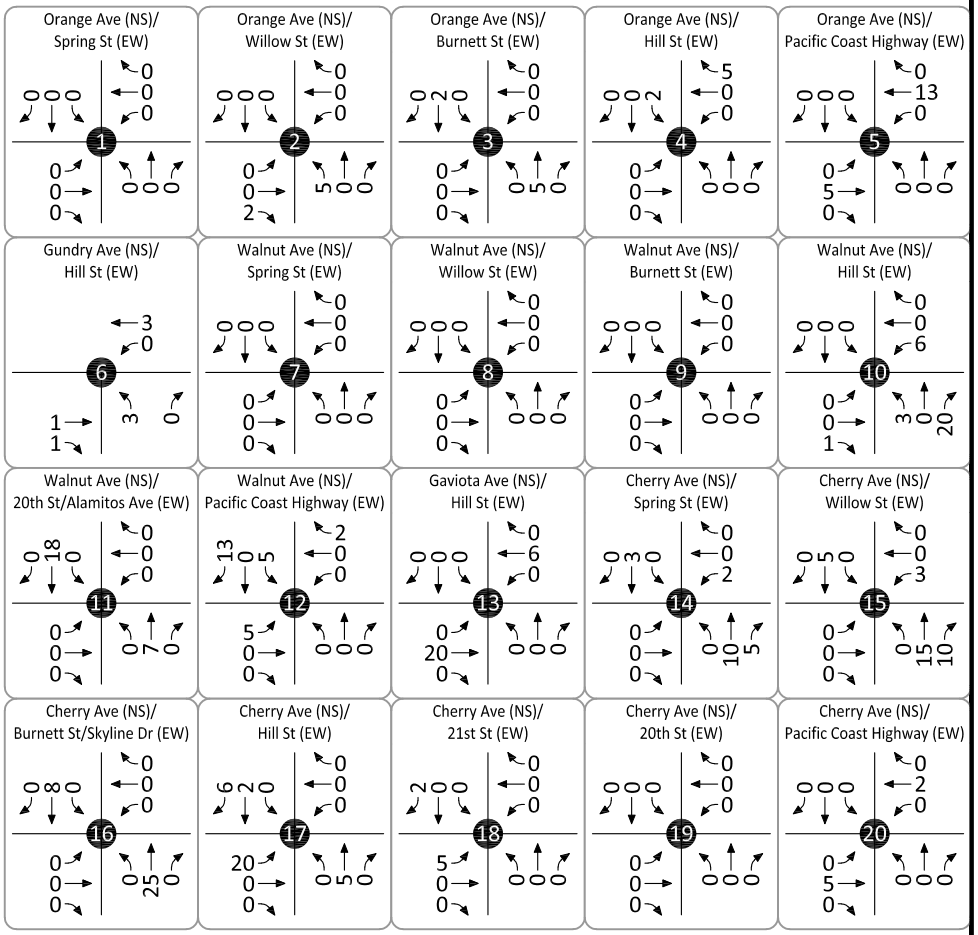
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Figure 21
Project Trucks (in PCE) Evening Peak Hour Intersection Turning Movement Volumes

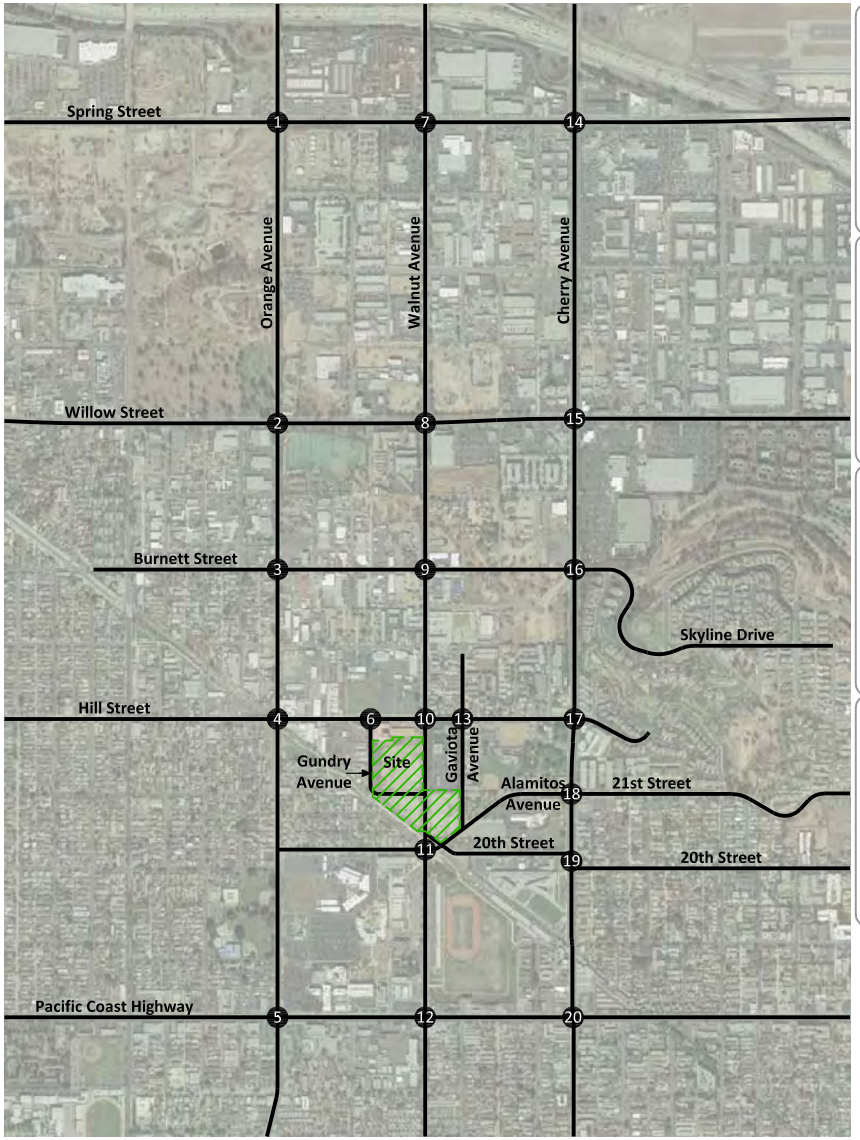


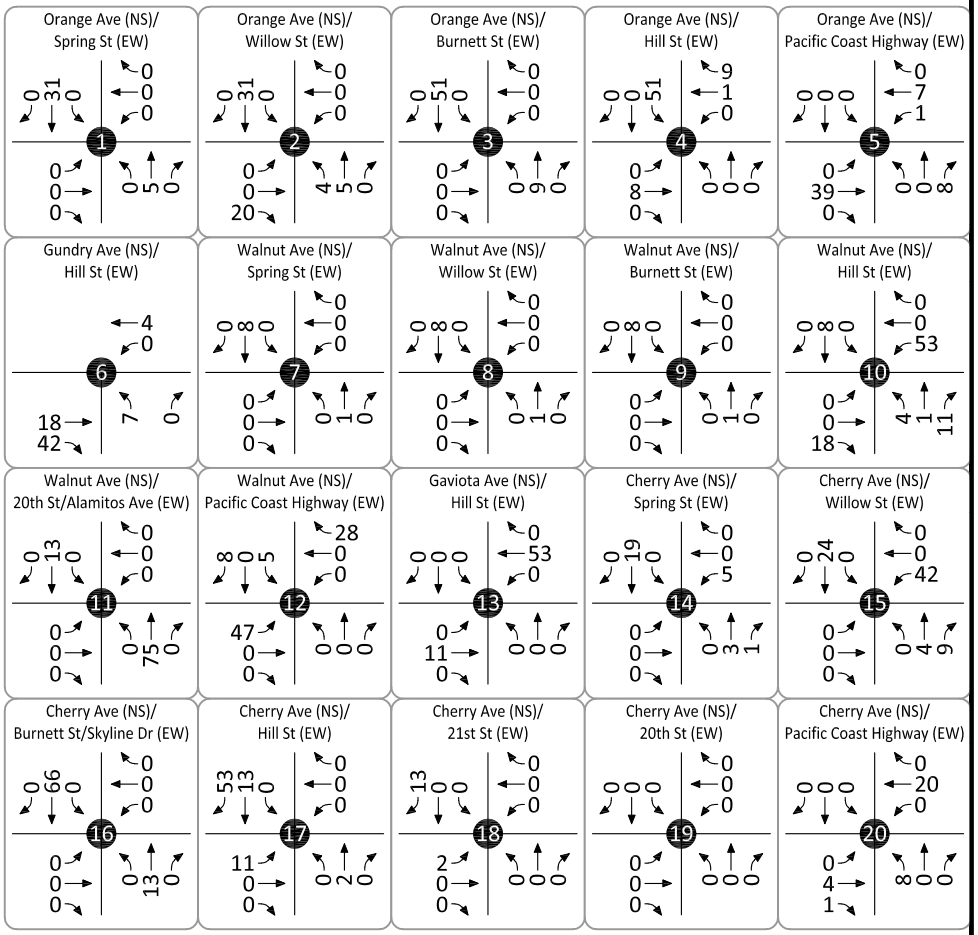


Legend

1 = Intersection Reference Number

Figure 22
Project Total Morning Peak Hour Intersection Turning Movement Volumes





Legend

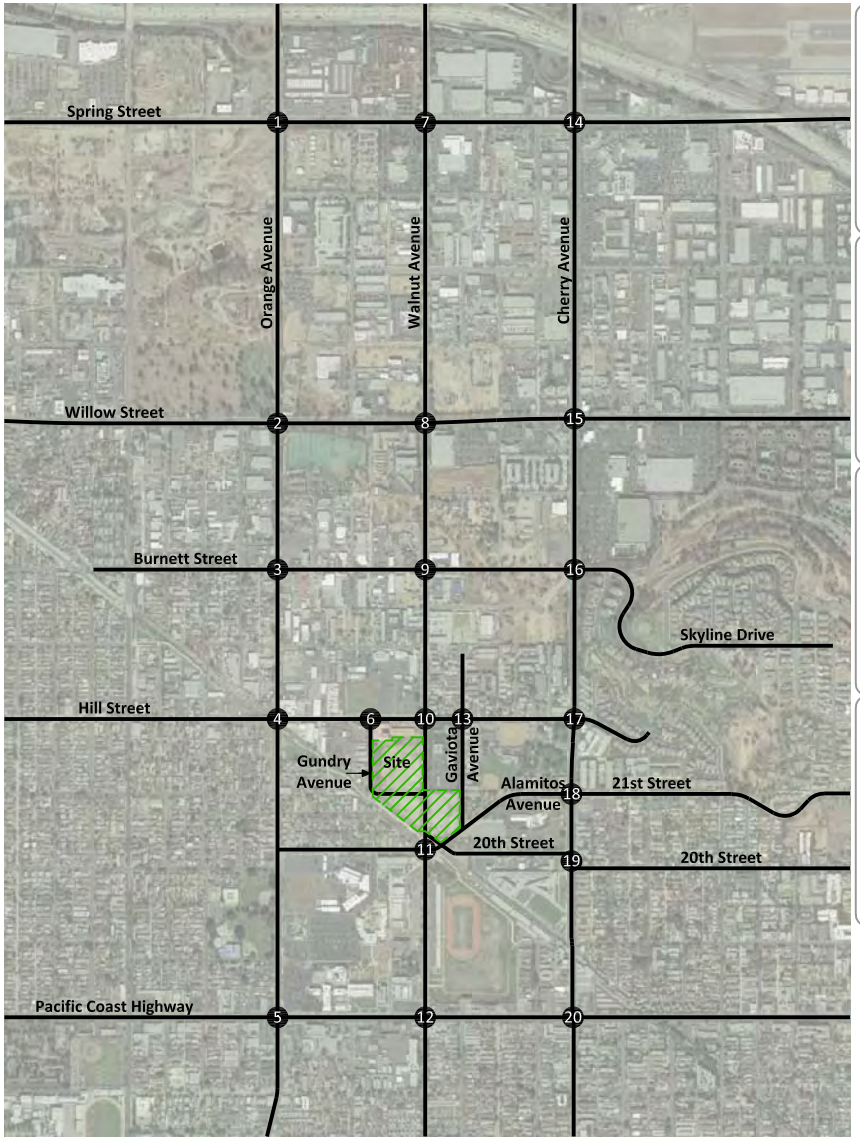
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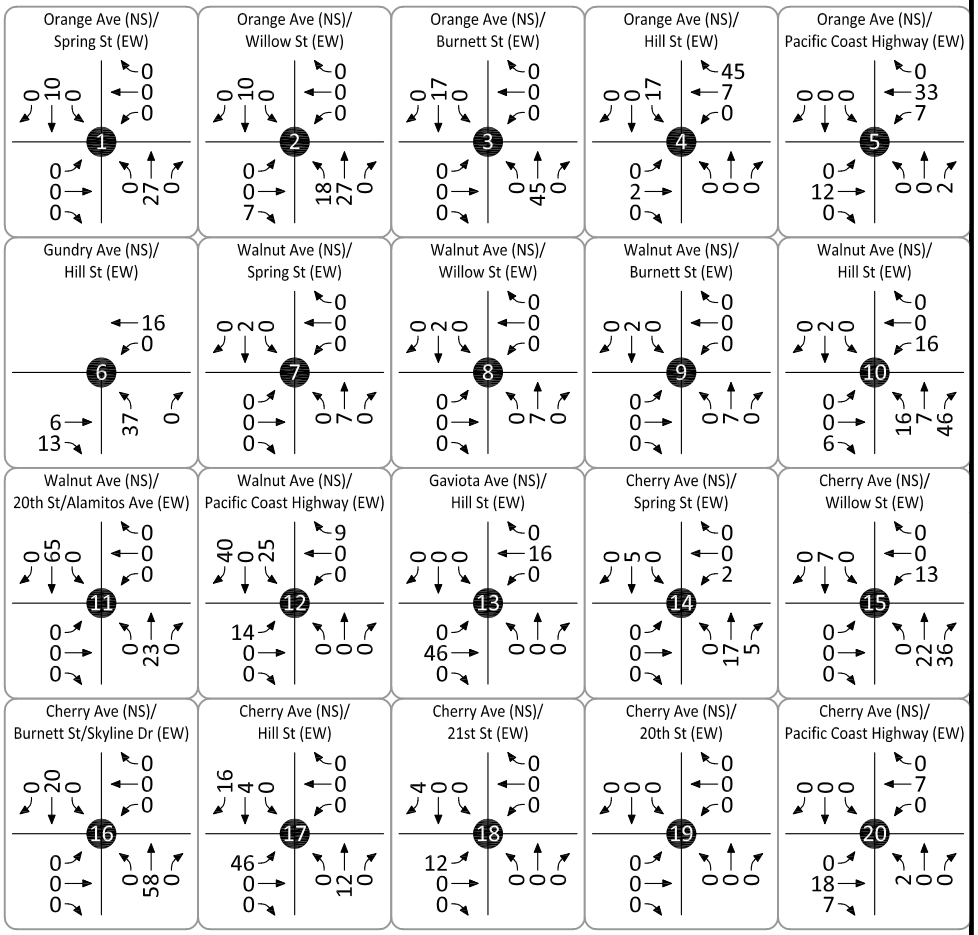
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Figure 23
Project Total Evening Peak Hour Intersection Turning Movement Volumes





Legend

1 = Intersection Reference Number

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V. FUTURE TRAFFIC VOLUMES

This section describes how traffic volumes for each future analysis scenario were derived. The forecast study area traffic volumes are illustrated on the figures contained in this chapter.

A. Method of Projection

To assess future traffic conditions, existing traffic volumes are combined with project trips, ambient growth, and other development trips. The project completion year for analysis purposes in this report is 2020.

1. Regional Ambient Growth

To account for ambient growth on roadways, existing traffic volumes were increased by a growth rate of one percent (1%) per year over two years for Opening Year (2020) conditions and over 20 years for General Plan Buildout conditions. This equates to a total growth factor of approximately 1.02 for Opening Year and 1.22 for General Plan Buildout conditions. This is a conservative assumption since the ambient growth was applied to all movements at the study intersections.

2. Other Developments

To assess cumulative traffic conditions, trips generated by other pending or approved development projects in the Cities of Signal Hill and Long Beach were forecast. Other developments within a 1.5-mile radius were identified and included in the trip generation summary shown in Table 3. Figure 24 shows the other development location map. The regional ambient growth is assumed to account for any additional trips generated by other developments outside the 1.5-mile radius.

Figure 25 and Figure 26 show the forecast morning and evening peak hour intersection turning movement volumes for trips generated by other developments, respectively.

B. Traffic Forecasts

1. Existing Plus Project

The traffic volumes for Existing Plus Project traffic conditions have been derived by adding the project generated trips to existing traffic volumes. Existing Plus Project morning and evening peak hour intersection turning movement volumes are shown on Figure 29 and Figure 30, respectively.

2. Opening Year (2020) Without Project

To assess Opening Year (2020) Without Project traffic conditions, existing traffic volumes were combined with ambient growth over a two year period and trips generated by other developments. Opening Year (2020) Without Project morning

and evening peak hour intersection turning movement volumes are shown on Figure 31 and Figure 32, respectively.

3. Opening Year (2020) With Project

To assess Opening Year (2020) With Project traffic conditions, project generated trips were added to Opening Year (2020) Without Project traffic volumes. Opening Year (2020) With Project morning and evening peak hour intersection turning movement volumes are shown on Figure 33 and Figure 34, respectively.

4. General Plan Buildout (Year 2040) Without Project

To assess General Plan Buildout (Year 2040) Without Project traffic conditions, existing traffic volumes were combined with ambient growth over a 20 year period and trips generated by other developments. General Plan Buildout (Year 2040) Without Project morning and evening peak hour intersection turning movement volumes are shown on Figure 35 and Figure 36, respectively.

5. General Plan Buildout (Year 2040) With Project

To assess General Plan Buildout (Year 2040) With Project traffic conditions, project generated trips were added to General Plan Buildout (Year 2040) Without Project traffic volumes. General Plan Buildout (Year 2040) With Project morning and evening peak hour intersection turning movement volumes are shown on Figure 37 and Figure 38, respectively.

Table 3

Other Development Trip Generation

City	ID	Address/Name	Land Use	Quantity	Units[1]	Source[2]	Morning Peak Hour			Evening Peak Hour			Daily
							In	Out	Total	In	Out	Total	
City of Signal Hill	SH1	2351 Walnut Avenue	Warehouse	7.904	TSF	ITE 150	1	0	1	0	2	2	14
			Office	2.051	TSF	ITE 710	2	0	2	0	2	2	20
			Subtotal				3	0	3	0	4	4	34
	SH2	1500 E. Spring St, Honda Expand	Automobile Sales	2.364	TSF	ITE 840	3	1	4	2	4	6	66
	SH3	1400 Spring St, Mazda Dealer	Automobile Sales	32.385	TSF	ITE 840	26	9	35	18	28	46	526
	SH4	Crescent Square	Single-Family Detached Residential	25	DU	ITE 210	5	14	19	16	9	25	236
	SH5	Zinnia	Multi-Family Affordable Housing	72	DU	[1]	14	22	36	14	10	24	294
	SH6	1939 Temple Ave, The Courtyard	Multi-Family Housing	10	DU	ITE 220	1	4	5	4	2	6	73
	SH7	2599 Pacific Coast Highway	Single-Family Detached Residential	7	DU	ITE 210	1	4	5	4	3	7	66
	SH8	Heritage Square	Supermarket	14.000	TSF	ITE 850	32	21	53	66	63	129	1,495
			Restaurant	18.100	TSF	ITE 931	7	6	13	95	46	141	1,518
			Retail	10.700	TSF	ITE 820	6	4	10	20	21	41	404
			Multi-Family Housing	199	DU	ITE 220	22	70	92	70	41	111	1,457
			Single-Family Detached Residential	4	DU	ITE 210	1	2	3	2	2	4	38
			- Internal Capture Trips			[2][3]	-6	-6	-12	-91	-92	-183	-195
			- Commercial Pass-By (34% PM, 10% AM/Daily)			[2][4]	-6	-10	-16	-55	-28	-83	-472
			Subtotal				56	87	143	107	53	160	4,245
City of Long Beach	LB1	2300 Redondo Avenue	Manufacturing	427.565	TSF	ITE 140	205	60	265	90	196	286	1,680
			- Cars (80%)				164	48	212	72	157	229	1,344
			- Trucks in PCE (20%, PCE = 2.0)				82	24	106	36	78	114	672
			Subtotal (PCEs)				246	72	318	108	235	343	2,016
	LB2	3311 Willow Street	Adult Day Care Facility	3.960	TSF	[3]	3	3	6	-4	0	-4	-83
	LB3	Willow Springs Park	Public Park	48.0	AC	ITE 411	0	1	1	3	2	5	37
Total Other Development Trips Generated							**358**	**217**	**575**	**272**	**350**	**622**	**7,510**

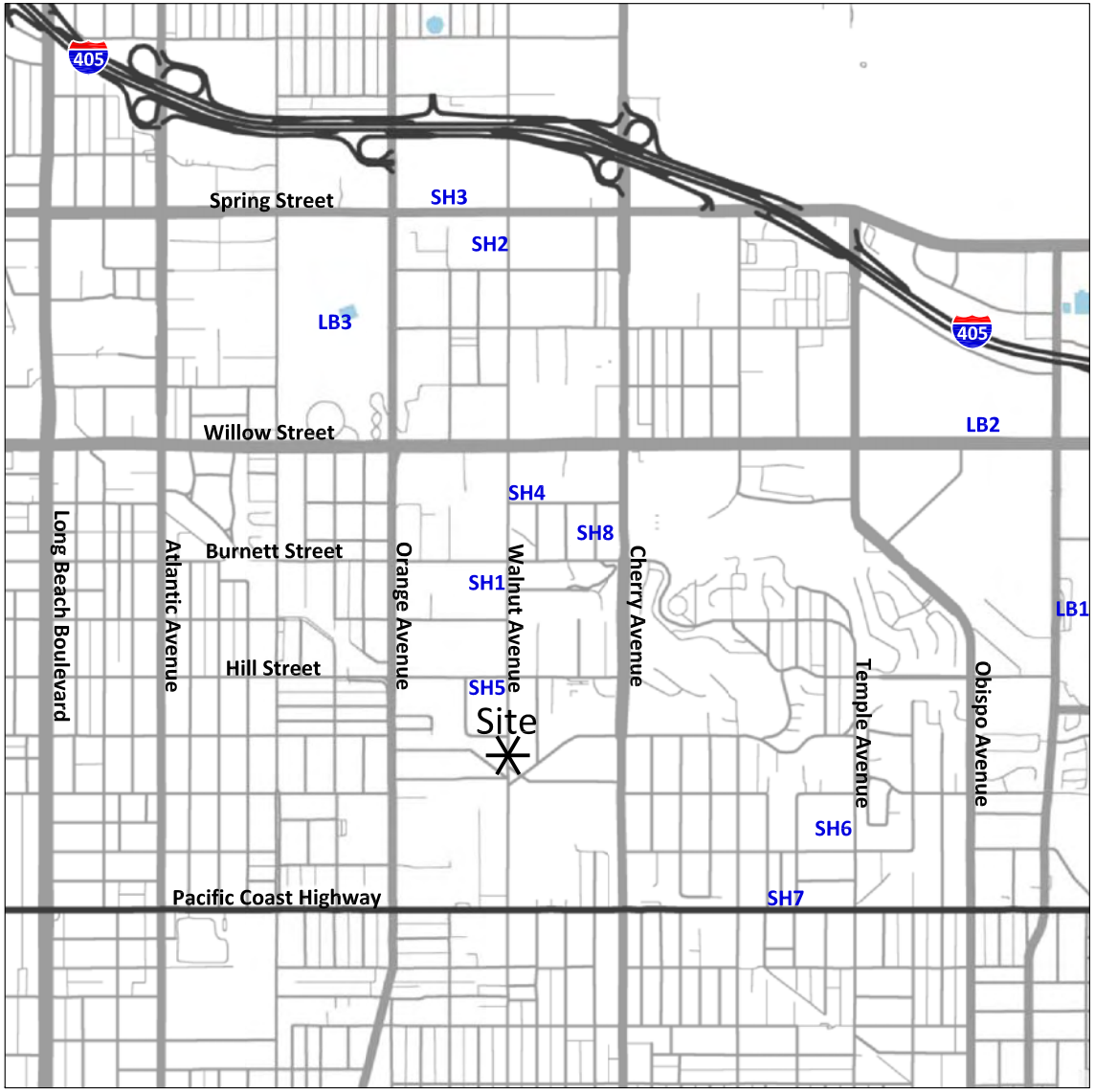
[1] TSF = Thousand Square Feet; DU = Dwelling Units; AC = Acres

[2] ITE = Institute of Transportation Engineers, Trip Generation Manual, 10th Edition, 2017; ### = Land Use Code. Based on General Urban/Suburban data, unless otherwise noted.
[1] = Los Angeles Department of Transportation, Transportation Impact Study Guidelines, December 2016.
[2] = Institute of Transportation Engineers, Trip Generation Handbook, 3rd Edition, 2017.
[3] = Focused Traffic Analysis for the 3311 E. Willow Street Adult Day Care Facility, LLG Engineers, December 2016.

[3] Internal capture percentages were calculated from the spreadsheet tool for mixed-use developments in accordance with the ITE Trip Generation Handbook.

[4] Per ITE Trip Generation Handbook, the average percent of pass-by trips ranges from 34% to 44% for the proposed commercial uses. A rate of 25% was used to provide a conservative analysis.

Figure 24
Other Development Location Map



Legend

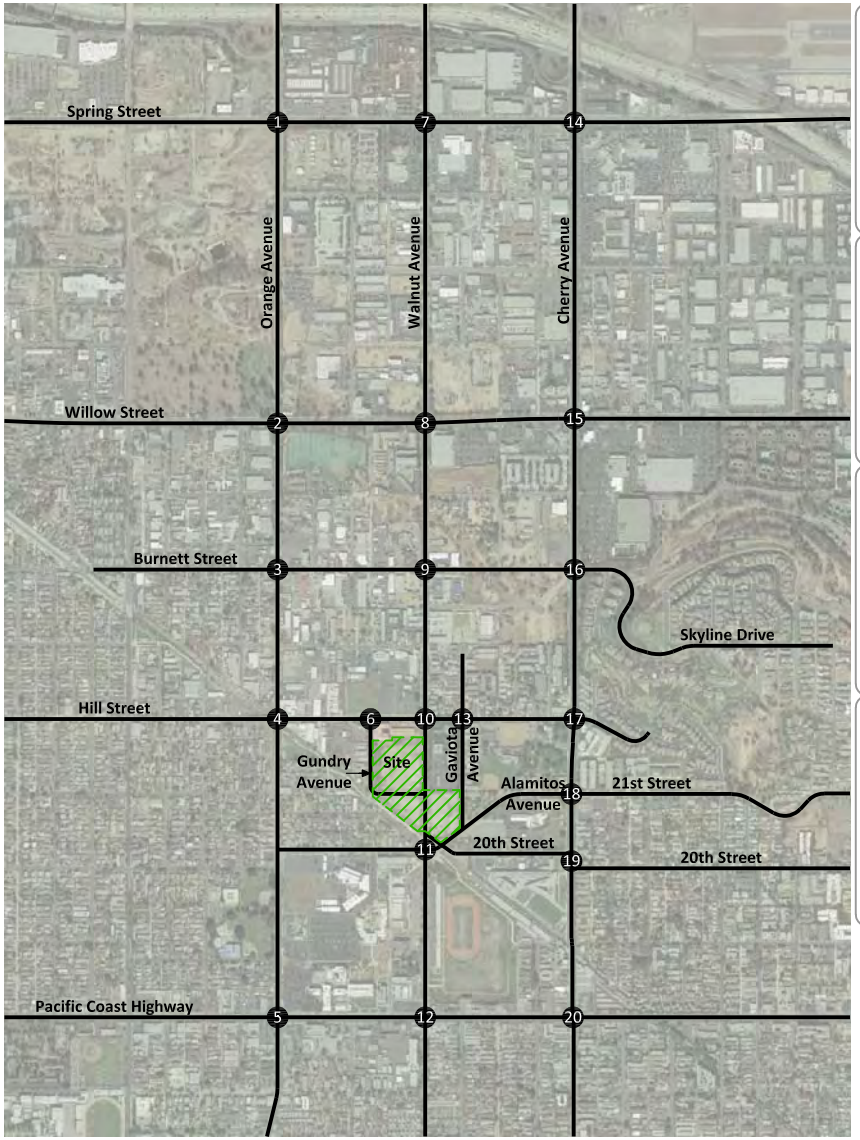
Signal Hill:

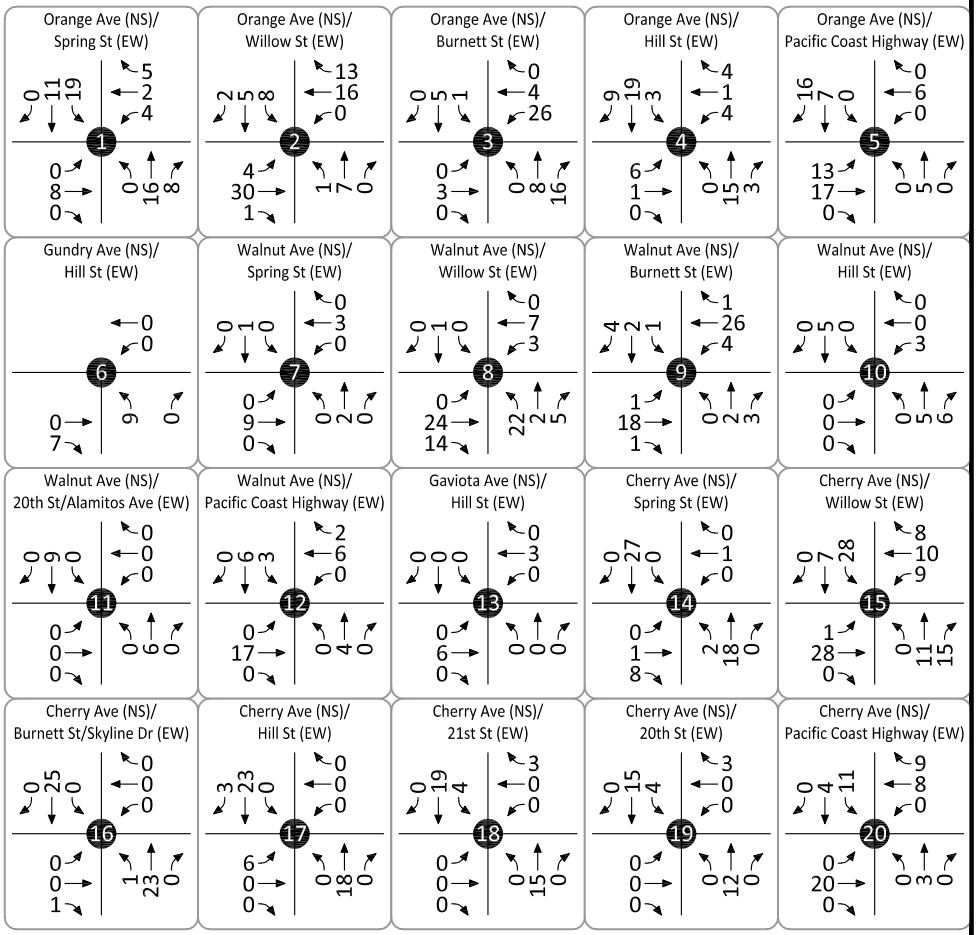
SH1	2351 Walnut Avenue
SH2	1500 E. Spring St., Honda Expansion
SH3	1400 E. Spring St, Mazda Dealer
SH4	Crescent Square
SH5	Zinnia
SH6	1939 Temple Ave, The Cortyard
SH7	2599 Pacific Coast Hwy
SH8	Heritage Square

Long Beach:

LB1	2300 Redondo
LB2	3311 Willow St
LB3	Willow Springs Park

Figure 25
Other Development Morning Peak Hour Intersection Turning Movement Volumes

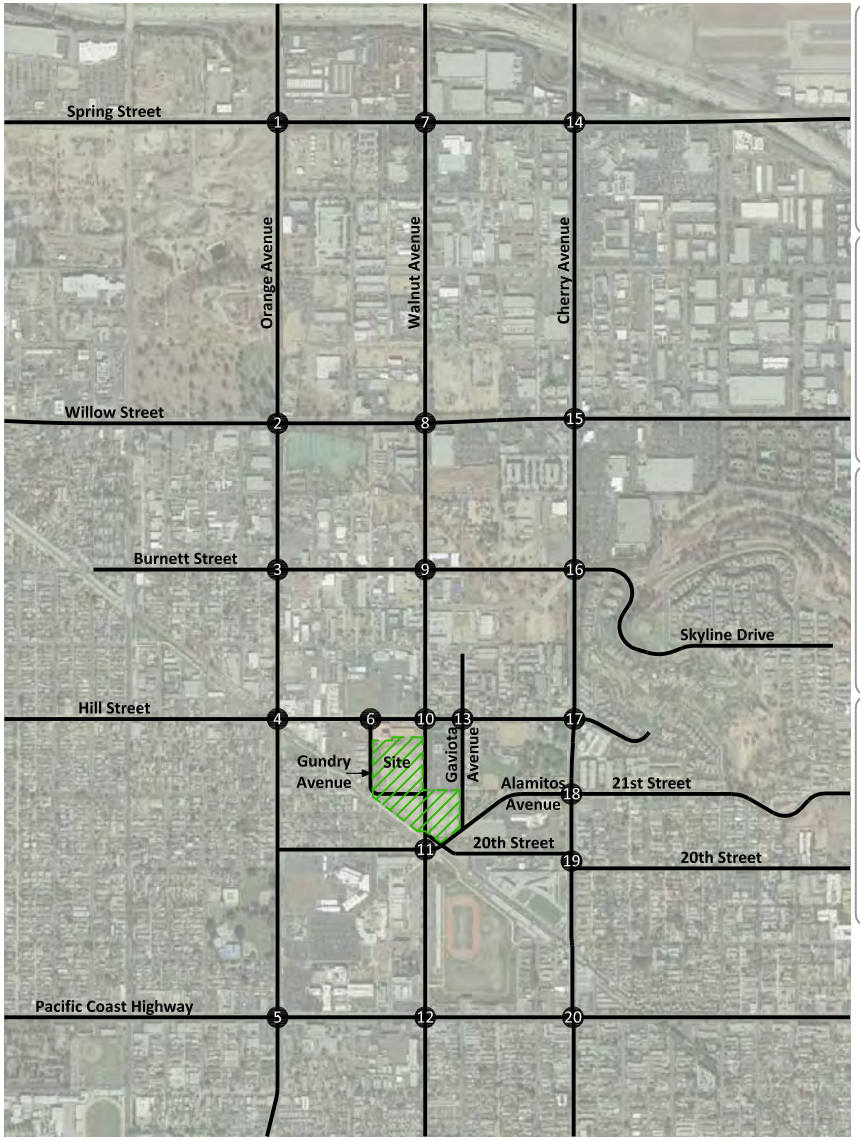


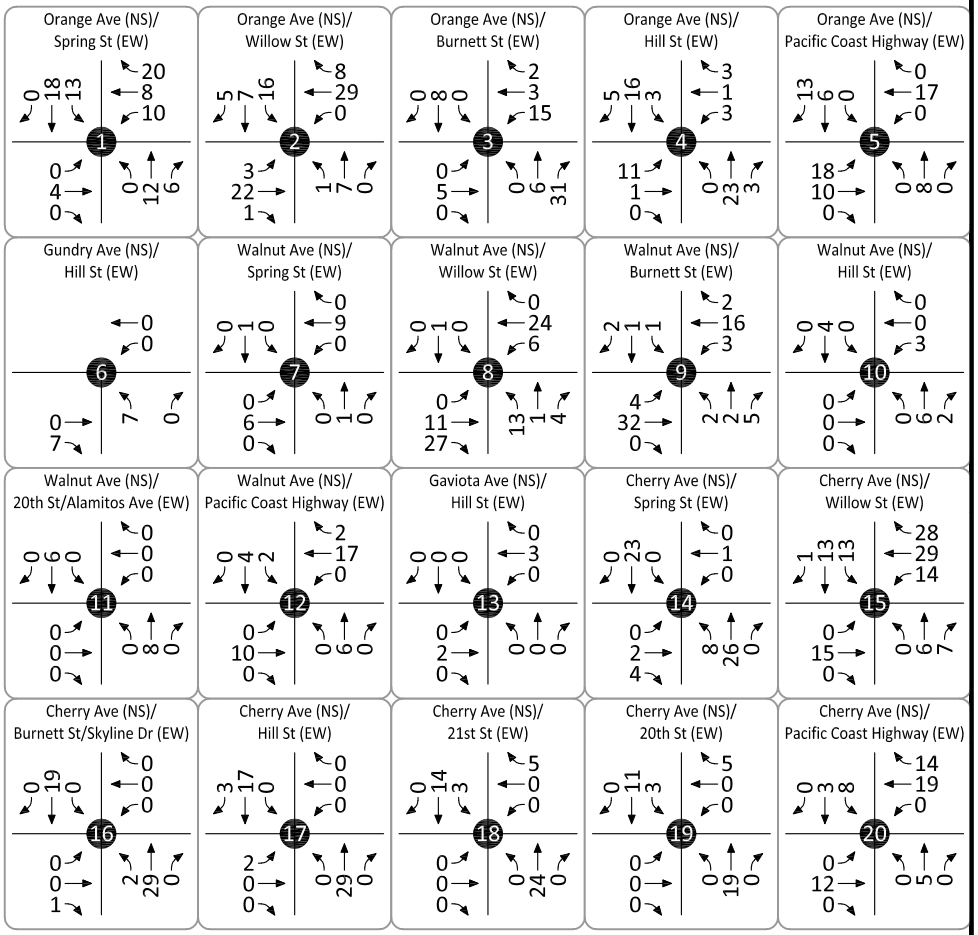


Legend

1 = Intersection Reference Number

Figure 26
Other Development Evening Peak Hour Intersection Turning Movement Volumes





Legend

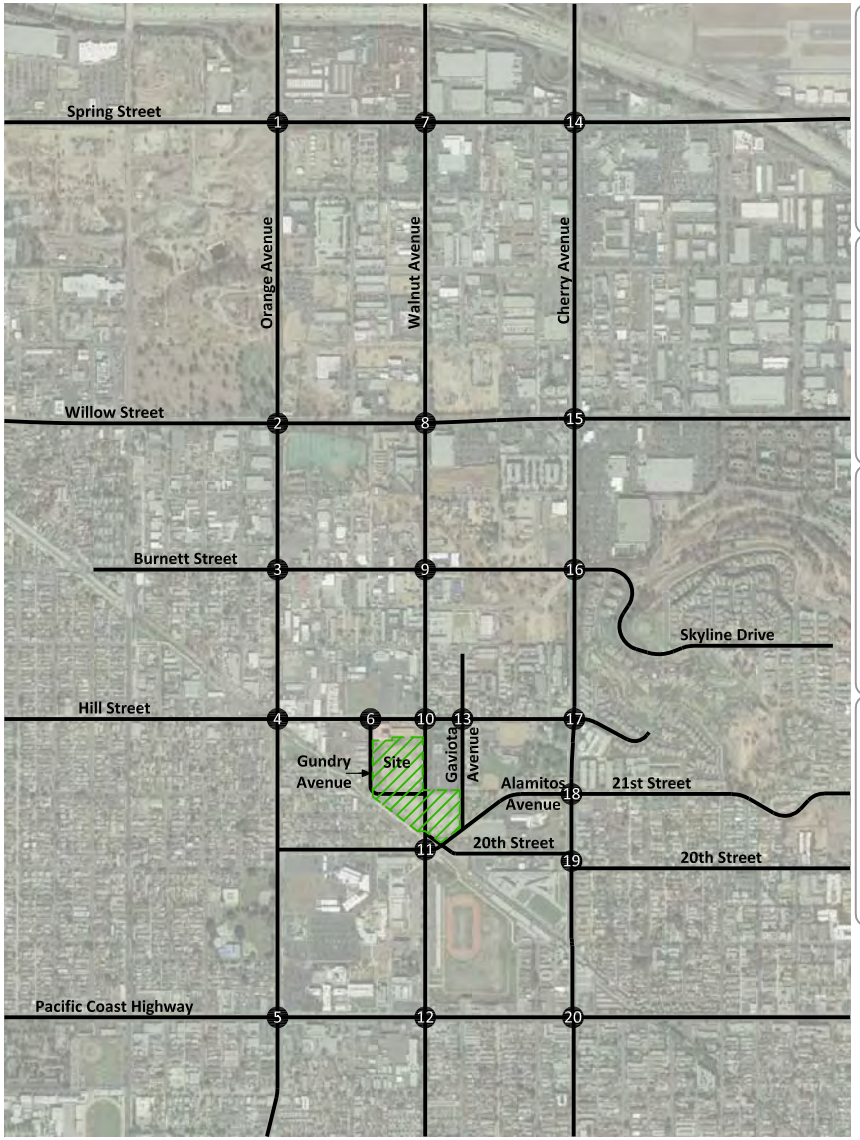
1 = Intersection Reference Number

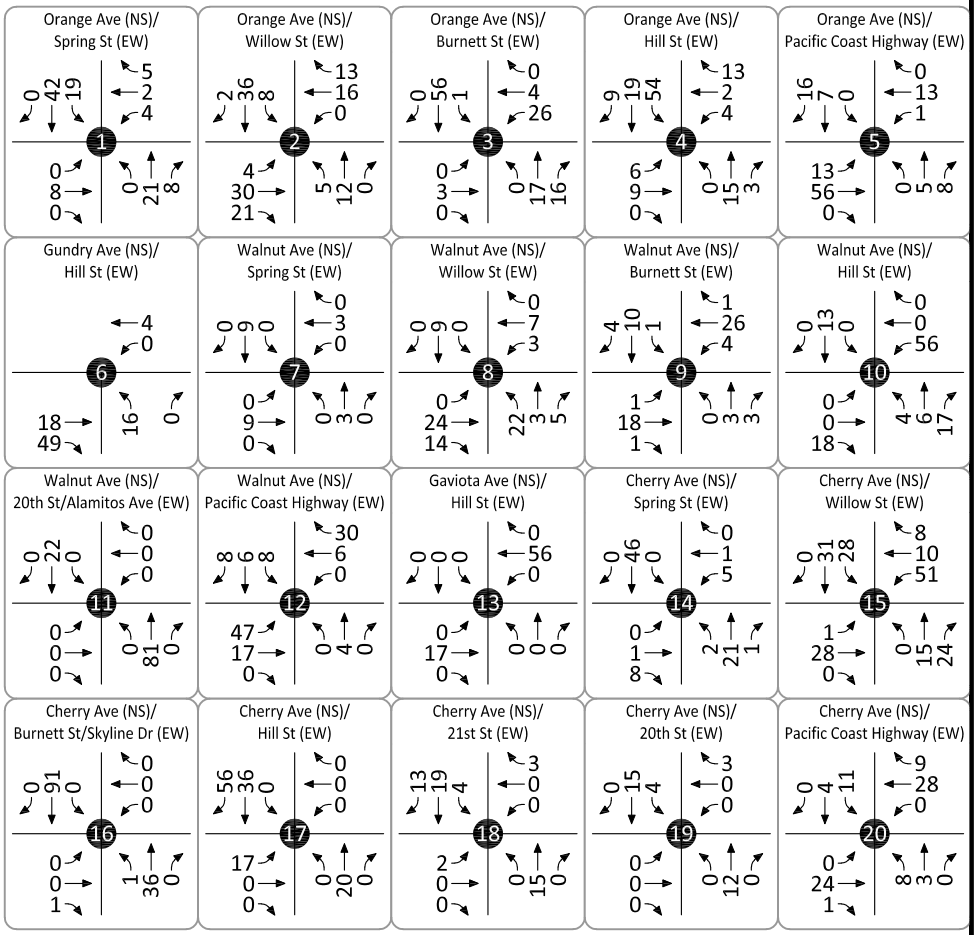
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Figure 27
Project Plus Other Development
Morning Peak Hour Intersection Turning Movement Volumes





Legend

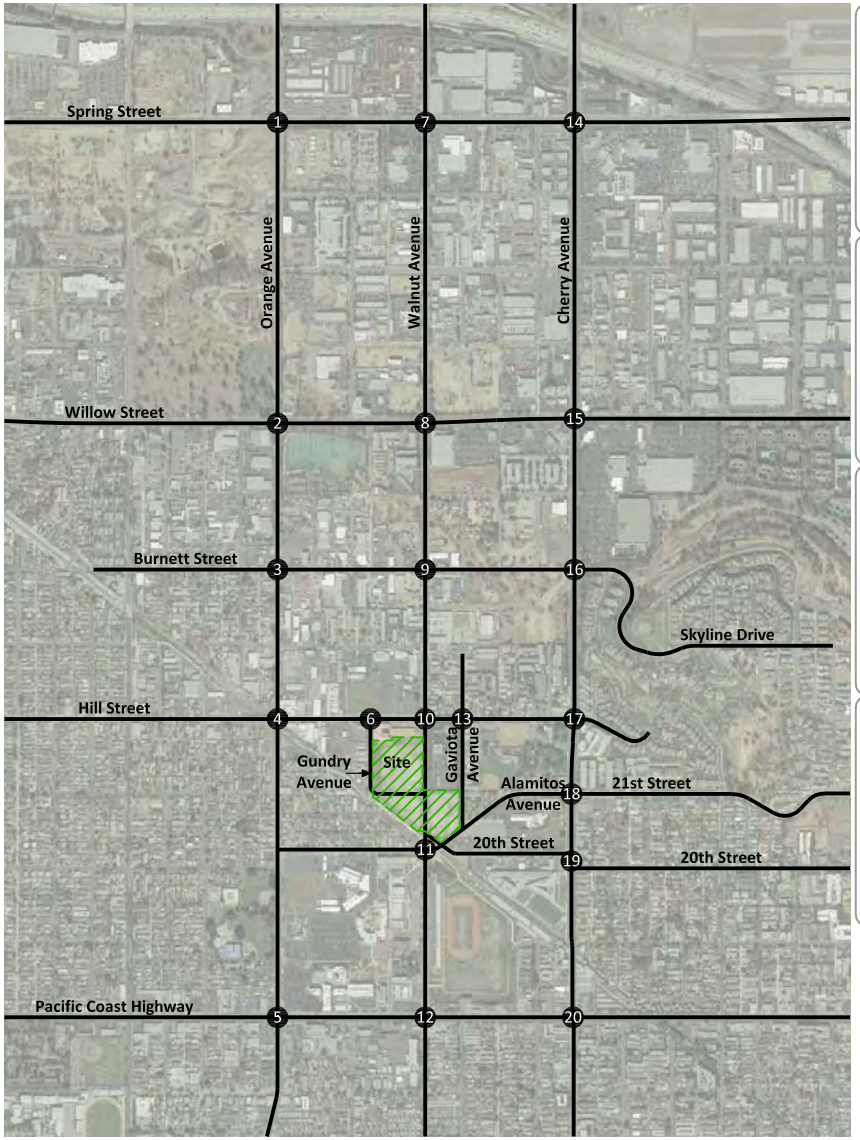
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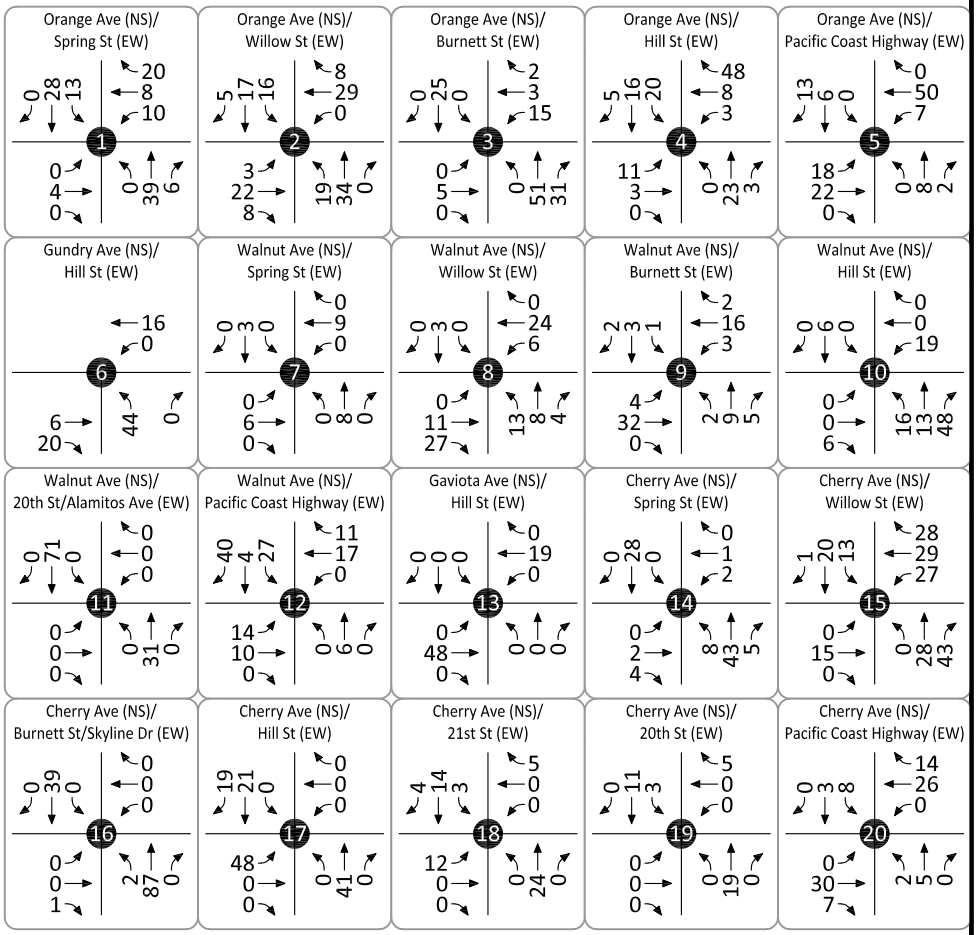
KUNZMAN ASSOCIATES, INC.

OVER 40 YEARS OF EXCELLENT SERVICE

JN 7311

Figure 28
Project Plus Other Development
Evening Peak Hour Intersection Turning Movement Volumes





Legend

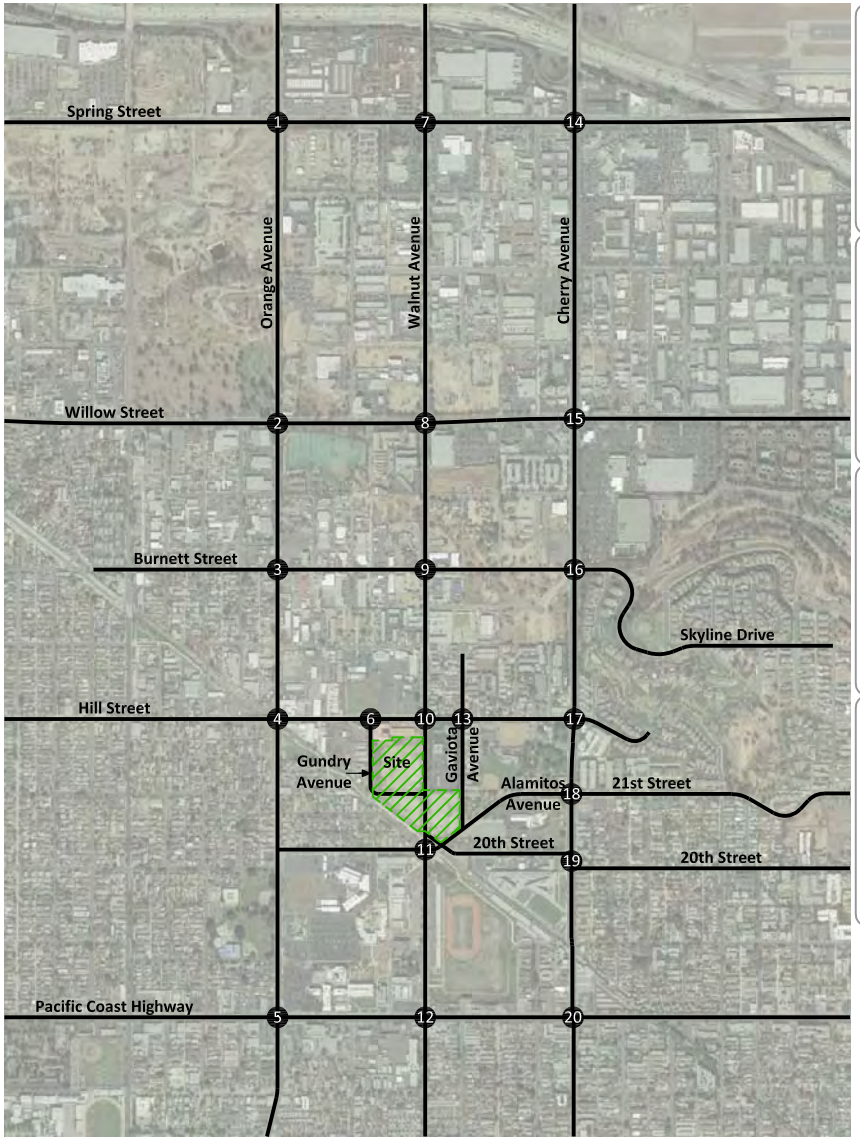
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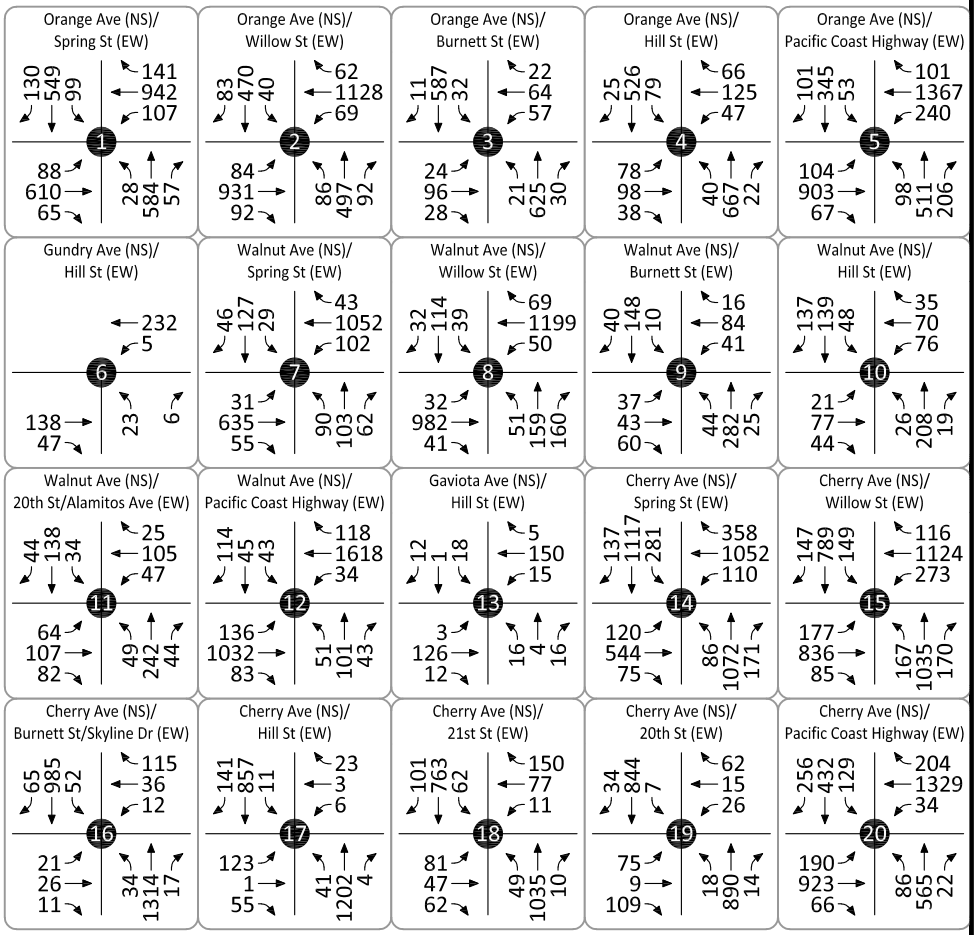
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Figure 29
Existing Plus Project Morning Peak Hour Intersection Turning Movement Volumes





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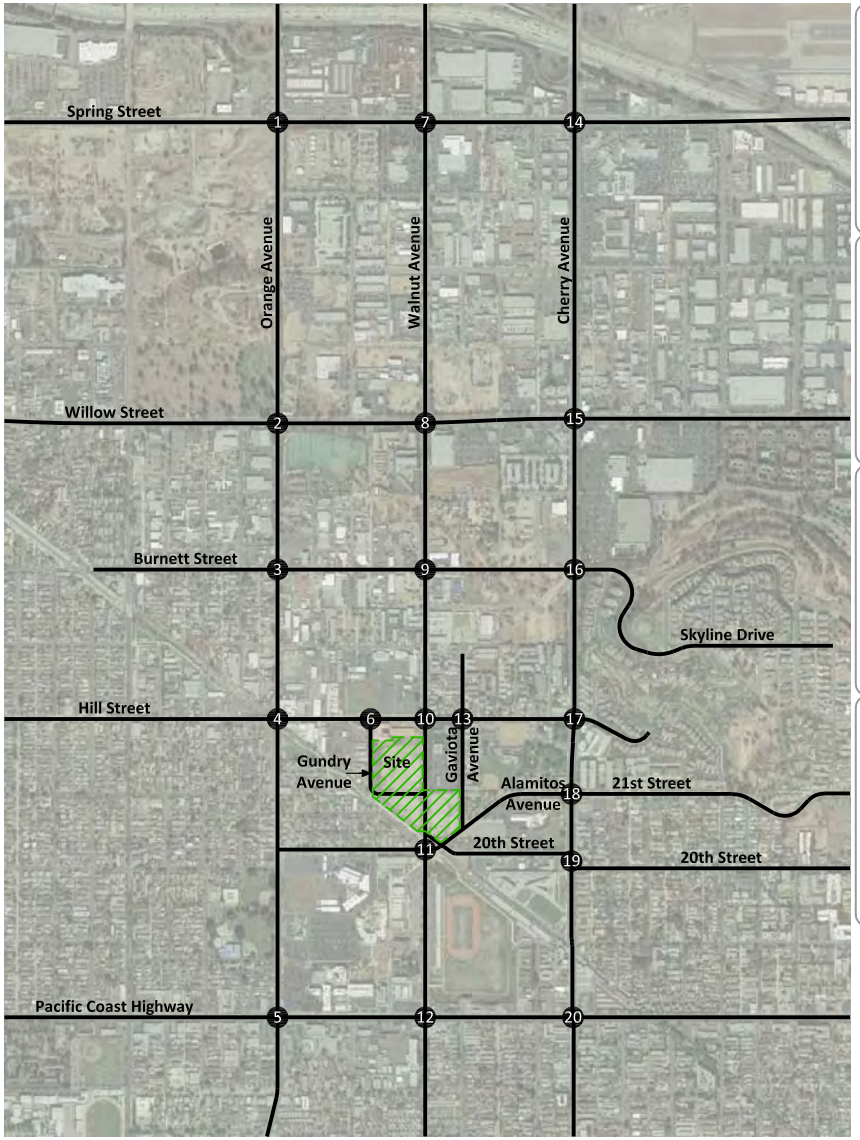
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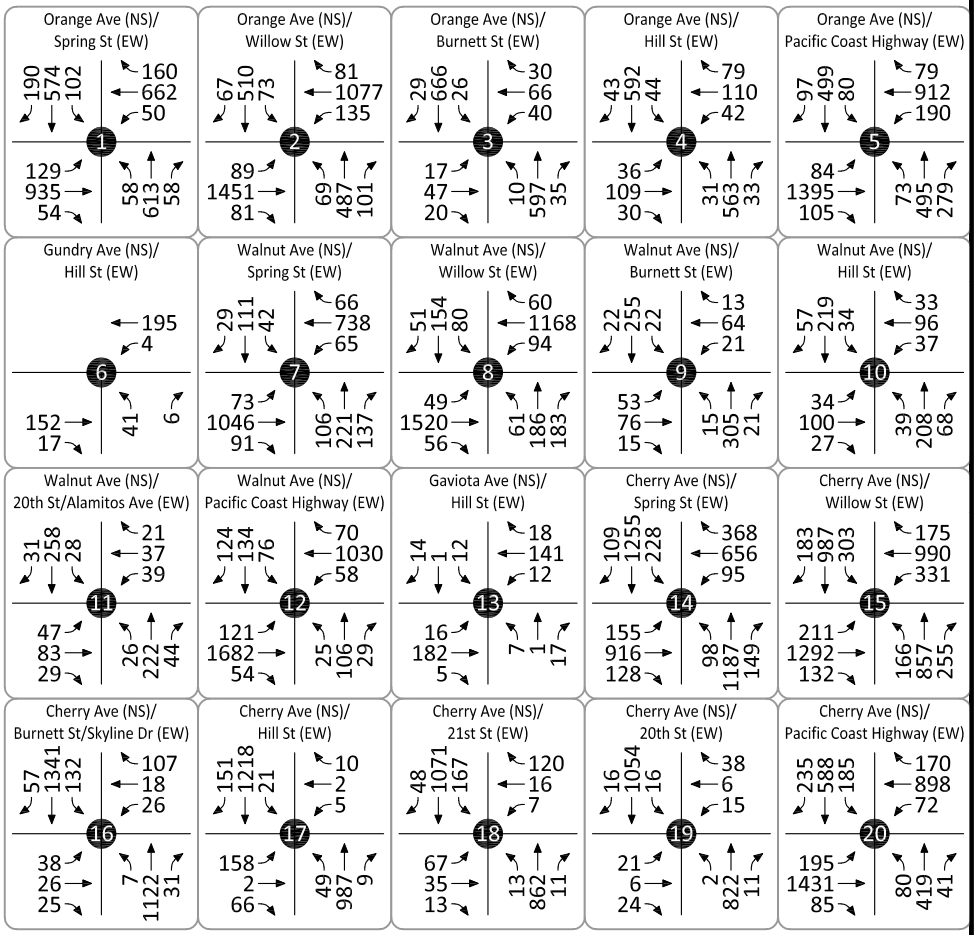
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JN 7311

Figure 30
Existing Plus Project Evening Peak Hour Intersection Turning Movement Volumes





Legend

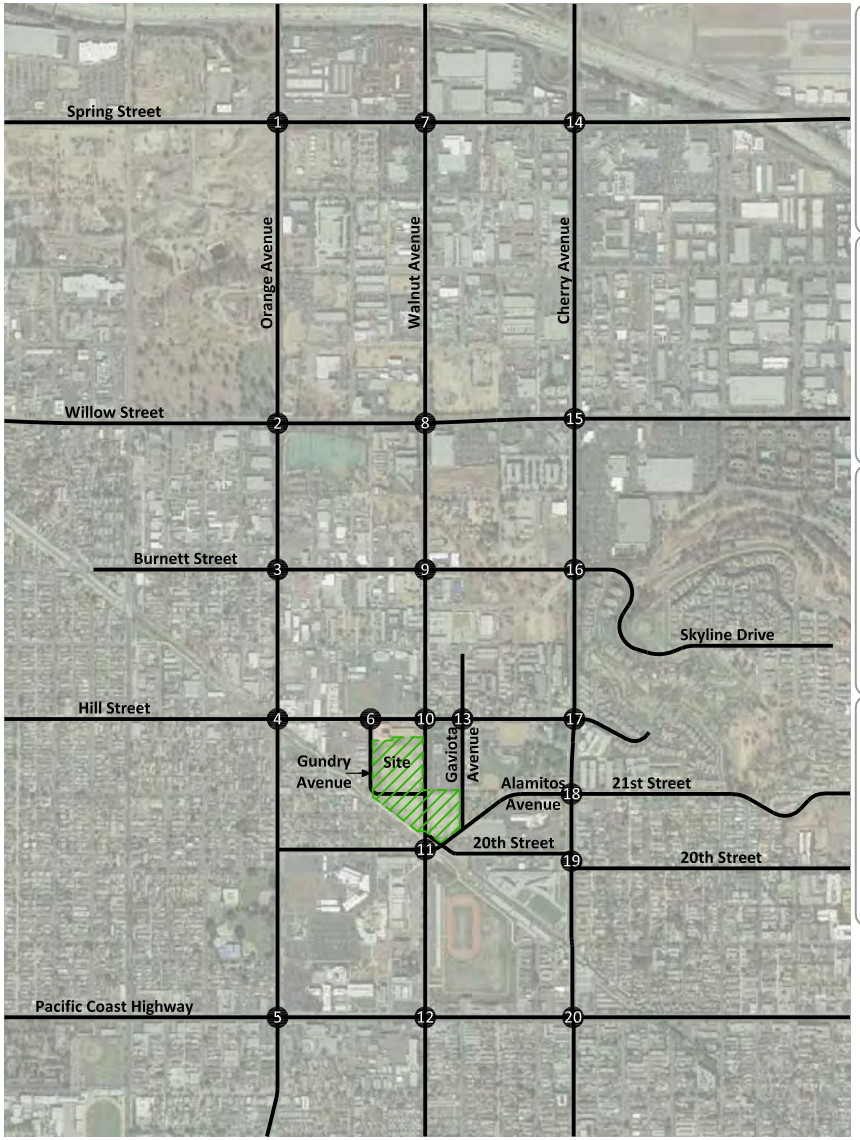
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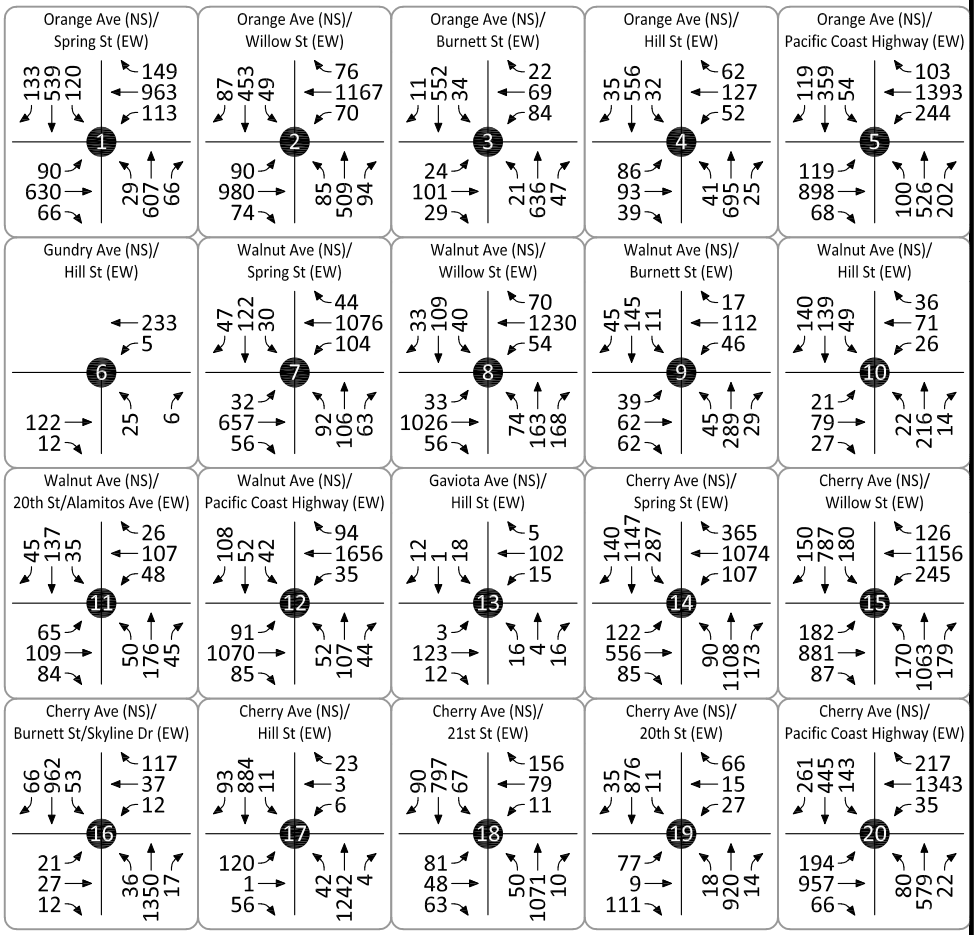
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Figure 31
Opening Year (2020) Without Project Morning Peak Hour Intersection Turning Movement Volumes





Legend

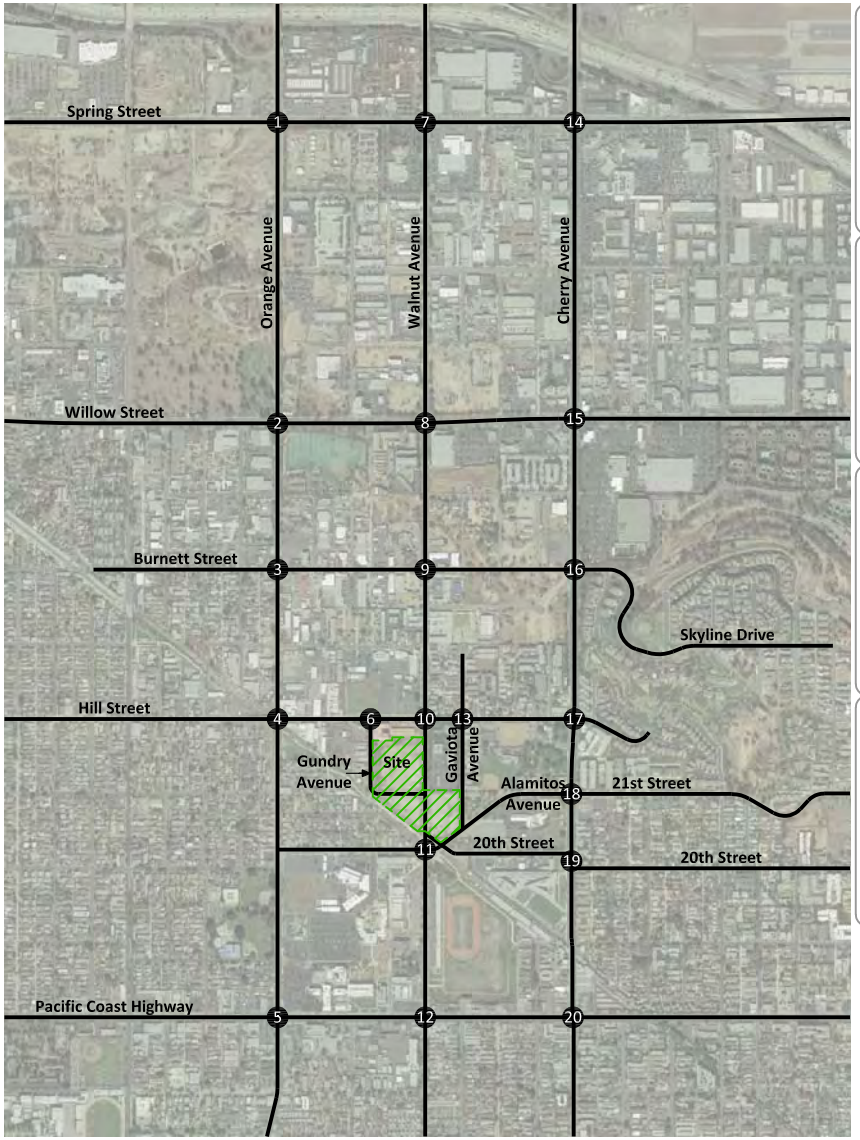
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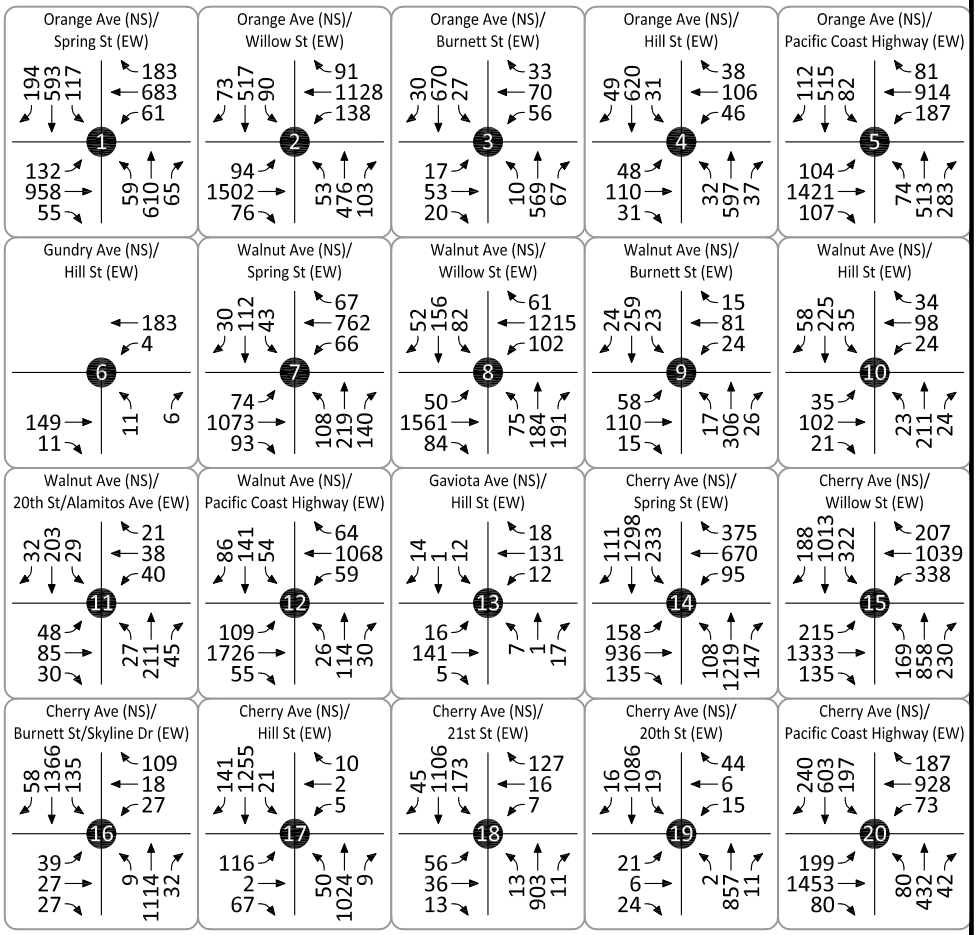
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Figure 32
Opening Year (2020) Without Project Evening Peak Hour Intersection Turning Movement Volumes





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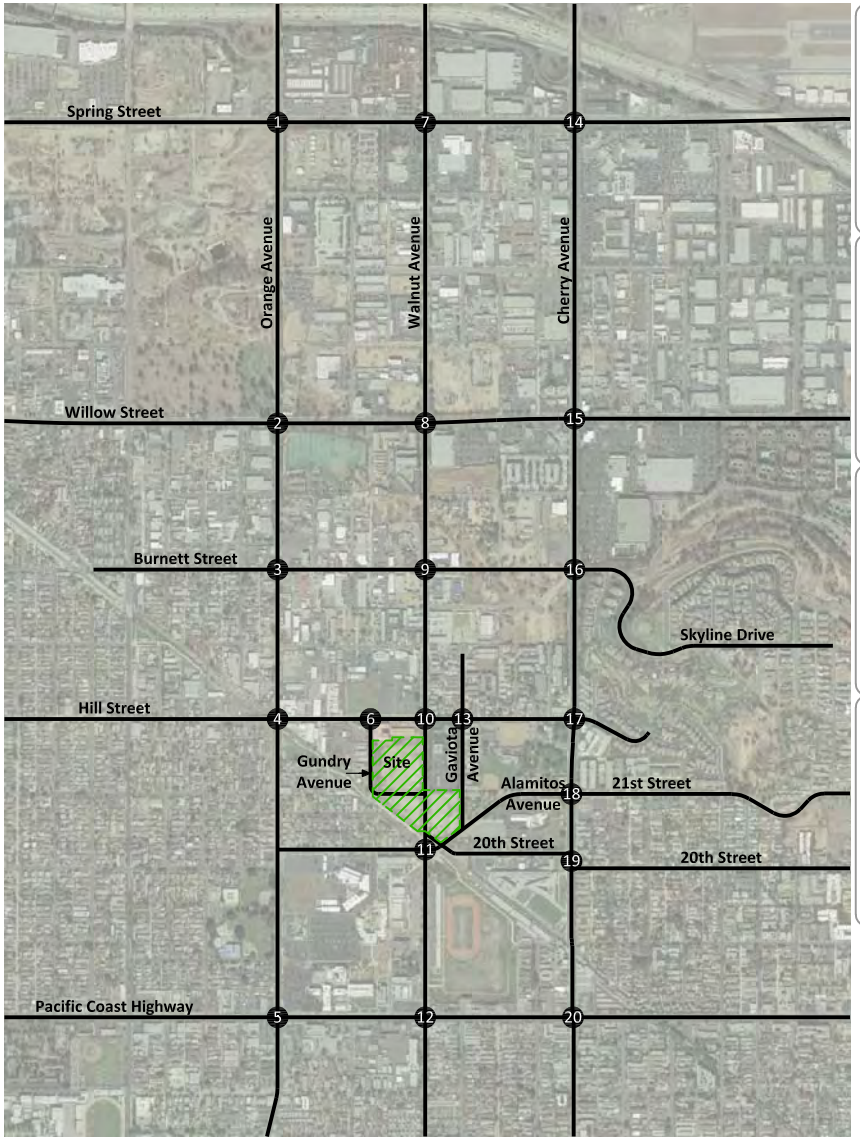
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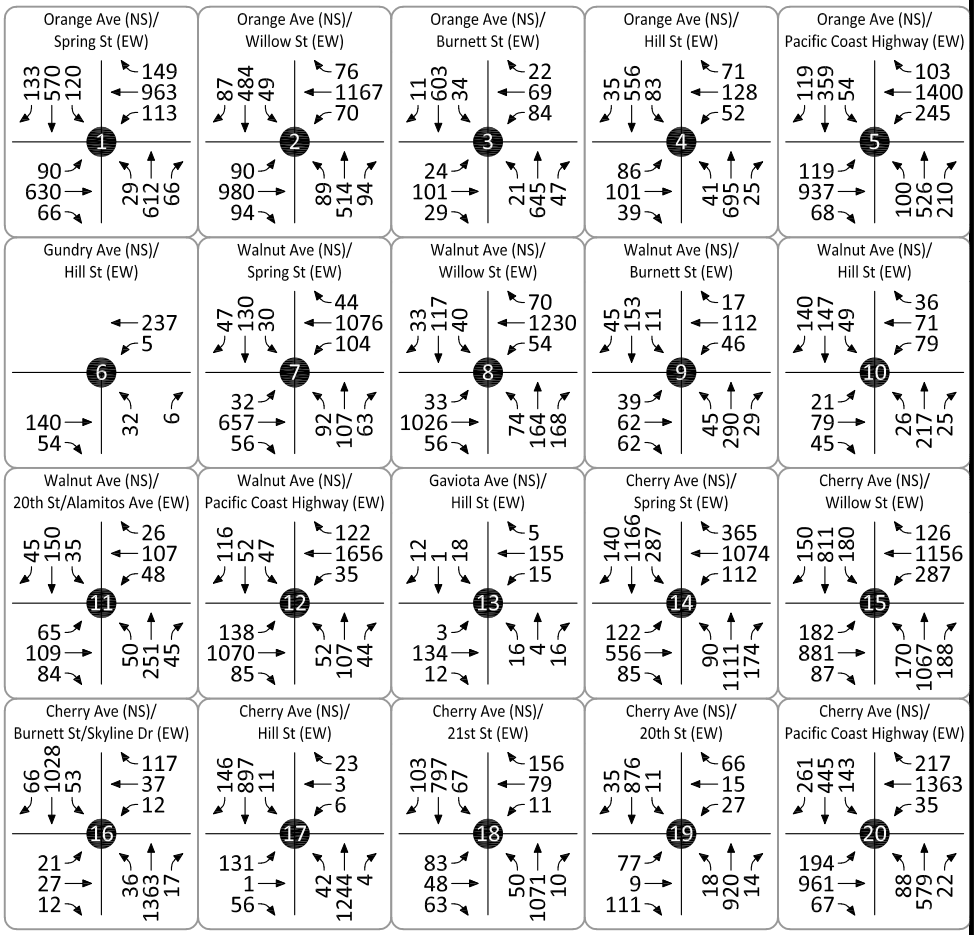
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Figure 33
Opening Year (2020) With Project Morning Peak Hour Intersection Turning Movement Volumes





Legend

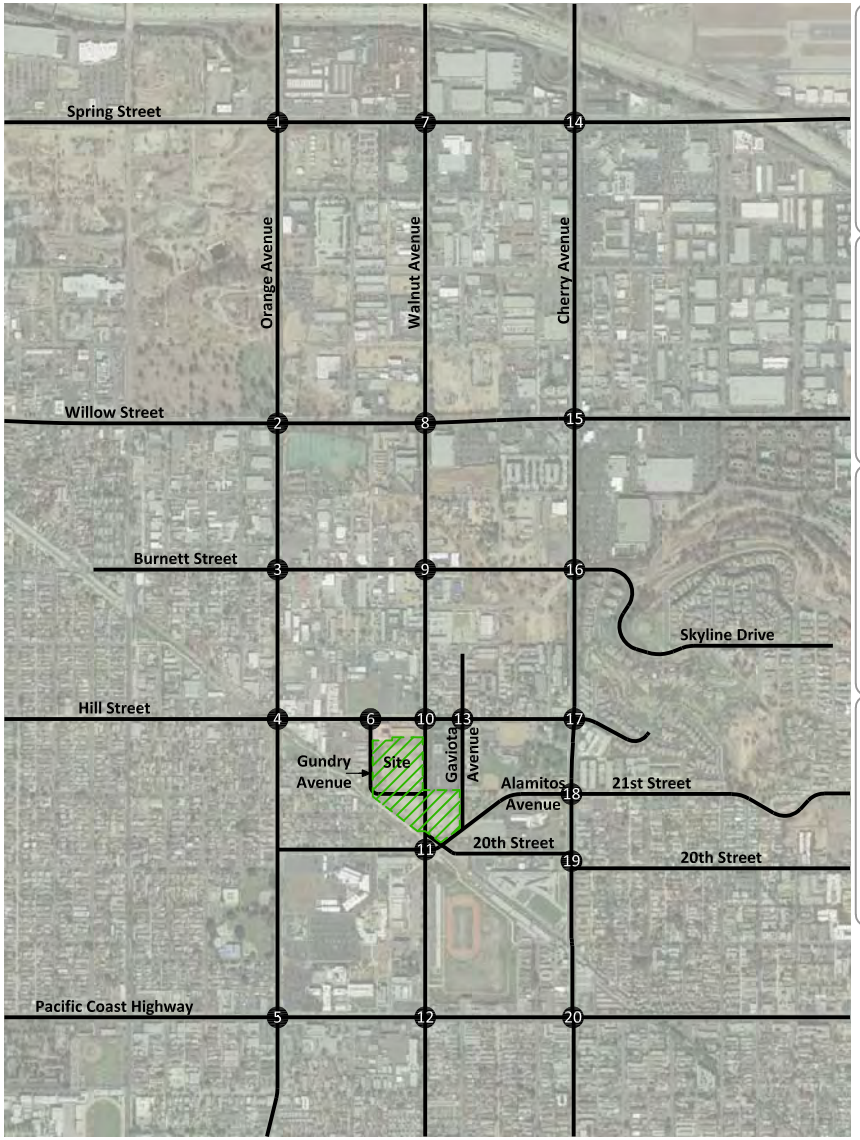
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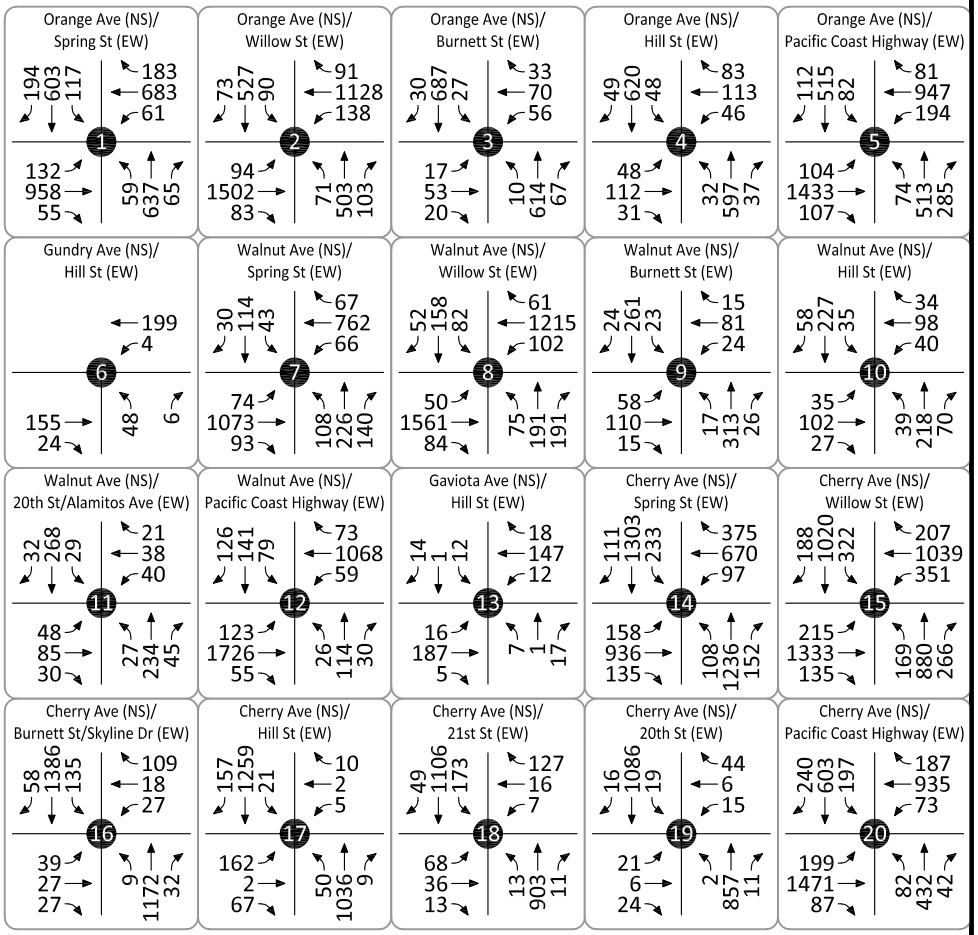
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OVER 40 YEARS OF EXCELLENT SERVICE

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Figure 34
Opening Year (2020) With Project Evening Peak Hour Intersection Turning Movement Volumes





Legend

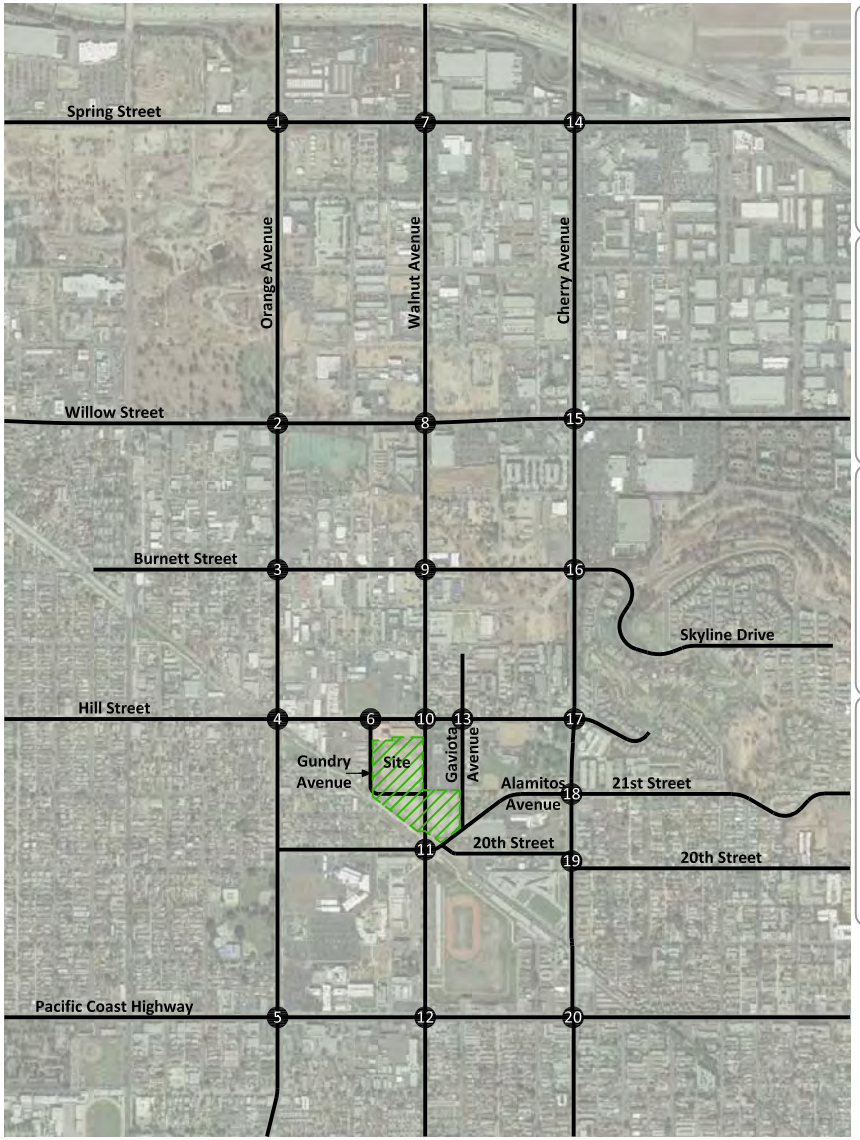
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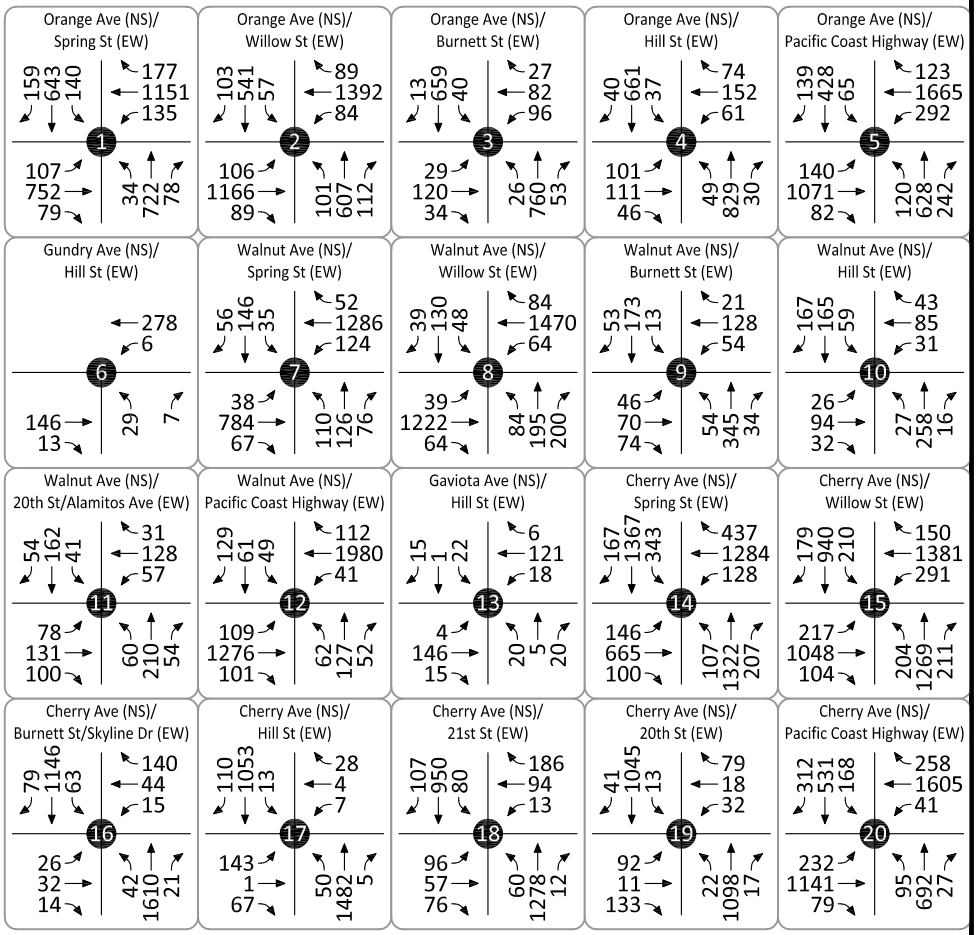
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OVER 40 YEARS OF EXCELLENT SERVICE

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Figure 35
General Plan Buildout (Year 2040) Without Project
Morning Peak Hour Intersection Turning Movement Volumes





Legend

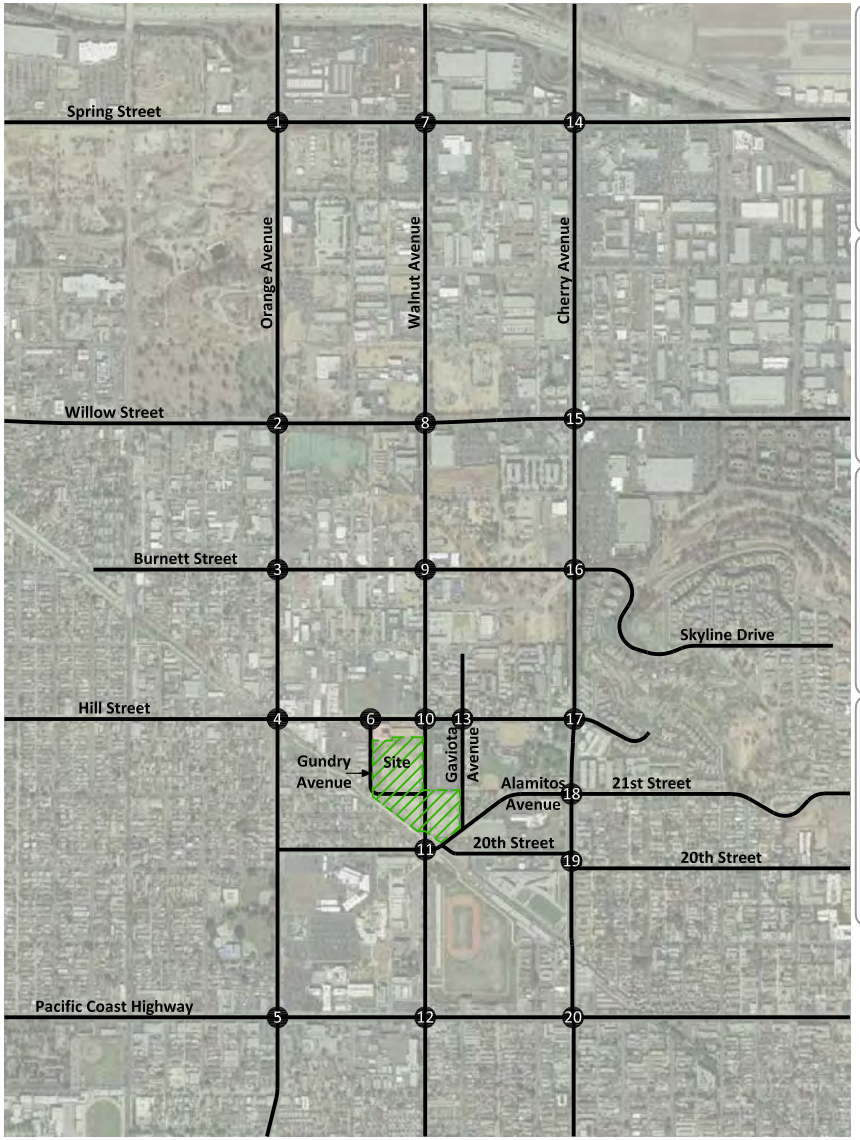
1 = Intersection Reference Number

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OVER 40 YEARS OF EXCELLENT SERVICE

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Figure 36
General Plan Buildout (Year 2040) Without Project
Evening Peak Hour Intersection Turning Movement Volumes



Orange Ave (NS)/ Spring St (EW)
232 706 137 215 816 71
157 1145 66 71 727 77

Orange Ave (NS)/ Willow St (EW)
87 617 105 107 1343 165
112 1792 91 63 568 123

Orange Ave (NS)/ Burnett St (EW)
35 800 32 39 84 64
21 62 24 12 679 74

Orange Ave (NS)/ Hill St (EW)
57 738 36 44 127 54
55 132 37 38 710 43

Orange Ave (NS)/ Pacific Coast Highway (EW)
131 615 98 96 1089 223
120 1697 128 89 612 338

Gundry Ave (NS)/ Hill St (EW)
218 5
178 12 12 7

Walnut Ave (NS)/ Spring St (EW)
35 134 51 81 909 79
89 1282 111 129 262 167

Walnut Ave (NS)/ Willow St (EW)
62 186 98 73 1449 121
60 1865 95 87 219 227

Walnut Ave (NS)/ Burnett St (EW)
29 310 28 18 94 29
69 125 18 20 366 31

Walnut Ave (NS)/ Hill St (EW)
70 269 41 40 117 29
41 122 26 28 251 29

Walnut Ave (NS)/ 20th St/Alamitos Ave (EW)
38 241 34 26 45 48
57 101 35 32 251 54

Walnut Ave (NS)/ Pacific Coast Highway (EW)
102 167 64 76 1274 71
131 2062 66 31 135 35

Gaviota Ave (NS)/ Hill St (EW)
17 1 15 22 156 15
20 168 6 9 1 21

Cherry Ave (NS)/ Spring St (EW)
133 1548 278 449 801 113
189 1120 160 128 1453 176

Cherry Ave (NS)/ Willow St (EW)
224 1209 383 242 1237 402
257 1591 161 203 1025 274

Cherry Ave (NS)/ Burnett St/Skyline Dr (EW)
70 1631 161 131 22 32
46 32 32 11 1327 38

Cherry Ave (NS)/ Hill St (EW)
168 1498 26 12 2 6
139 2 81 60 1219 11

Cherry Ave (NS)/ 21st St (EW)
54 1321 207 151 20 9
67 43 16 16 1076 13

Cherry Ave (NS)/ 20th St (EW)
20 1297 23 51 7 18
26 7 29 2 1022 13

Cherry Ave (NS)/ Pacific Coast Highway (EW)
287 720 234 221 1106 88
238 1736 95 95 516 50

Legend

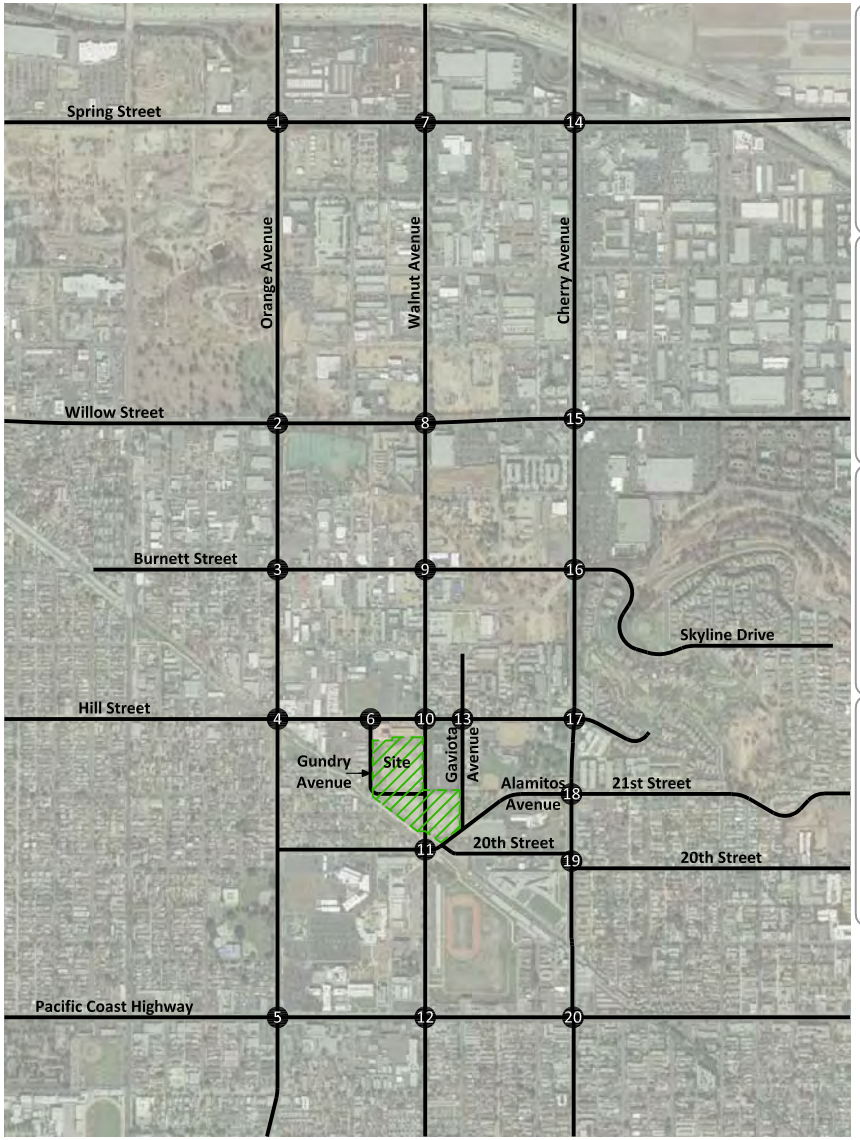
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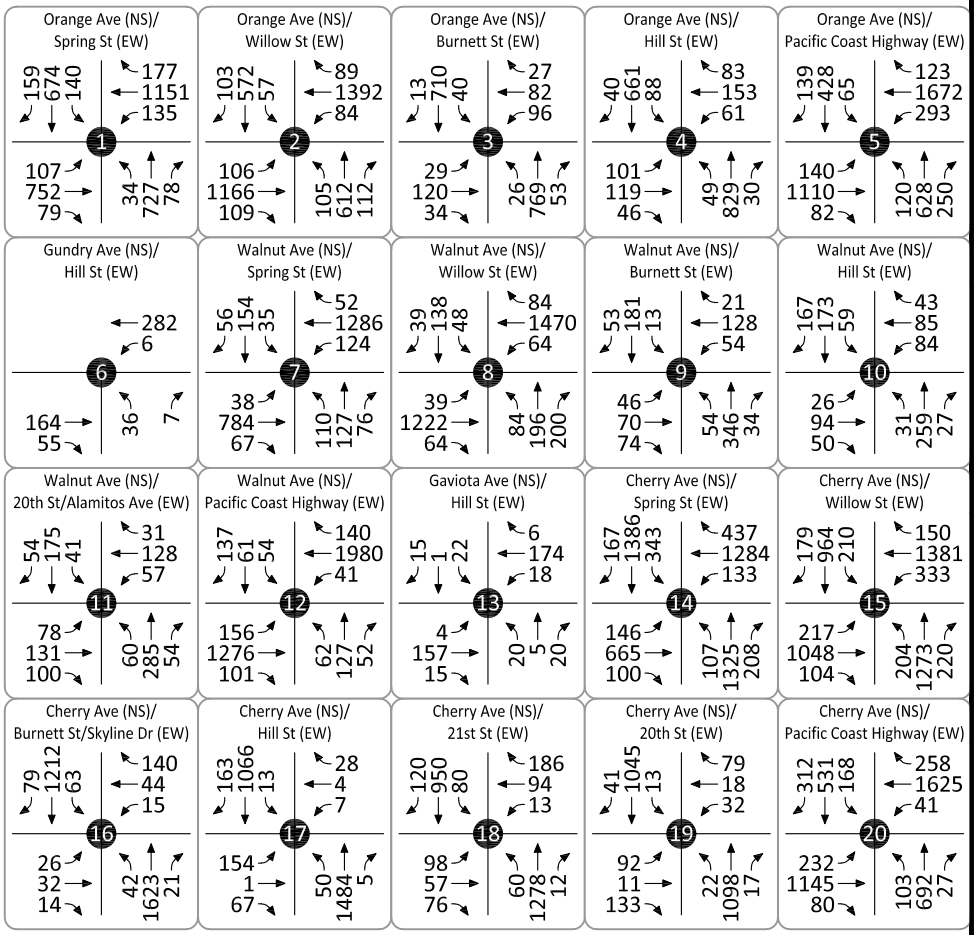
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OVER 40 YEARS OF EXCELLENT SERVICE

JN 7311

Figure 37
General Plan Buildout (Year 2040) With Project
Morning Peak Hour Intersection Turning Movement Volumes





Legend

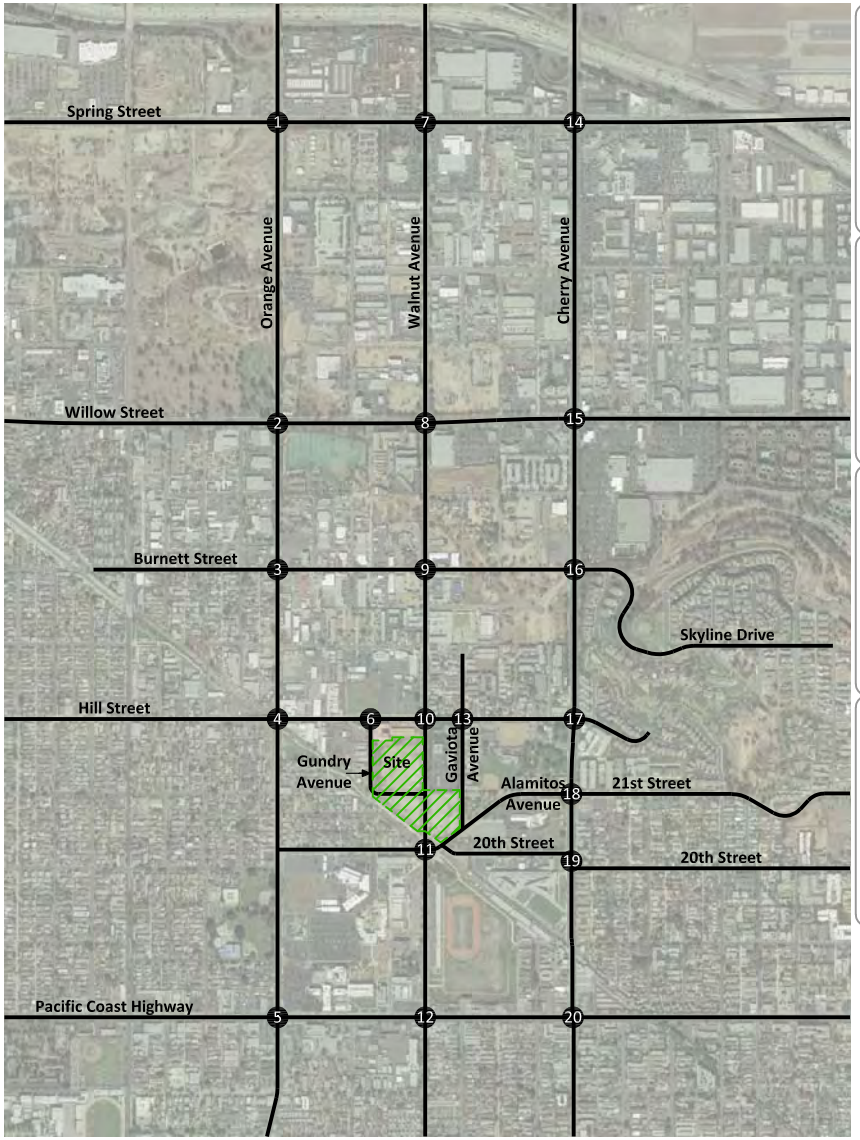
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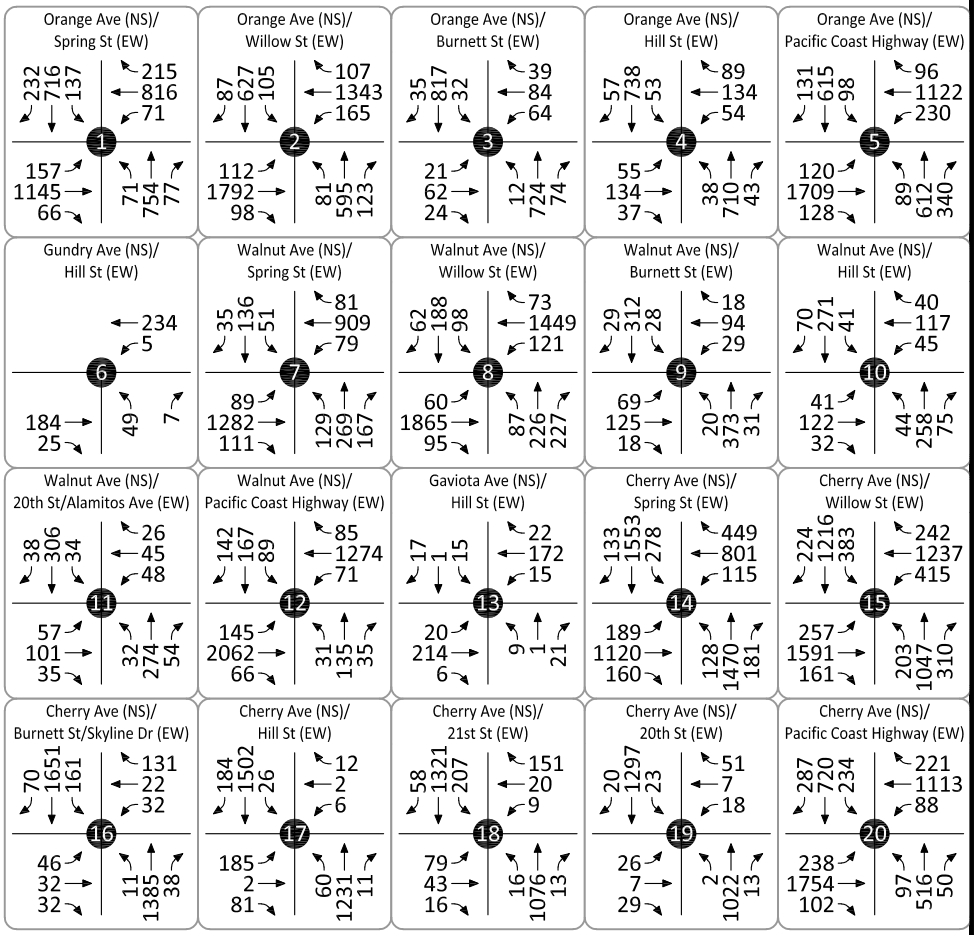
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Figure 38
General Plan Buildout (Year 2040) With Project
Evening Peak Hour Intersection Turning Movement Volumes





Legend

1 = Intersection Reference Number

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OVER 40 YEARS OF EXCELLENT SERVICE

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VI. FUTURE LEVELS OF SERVICE & IMPACT EVALUATION

Detailed Intersection Capacity Utilization/delay and Level of Service calculation worksheets for each of the following analysis scenarios are provided in Appendix C.

A. Existing Plus Project

1. Intersection Capacity Utilization/Delay and Levels of Service

   The Intersection Capacity Utilization/delay and Levels of Service for Existing Plus Project traffic conditions are shown in Table 4. As shown in Table 4, the study intersections are projected to operate within acceptable Levels of Service (D or better) during the peak hours for Existing Plus Project traffic conditions.

2. Significant Impact Evaluation

   Table 5 evaluates the project impact at the study intersections for Existing Plus Project traffic conditions. As shown in Table 5, the proposed project is forecast to result in no significant traffic impacts at the study intersections for Existing Plus Project traffic conditions.

B. Opening Year (2020) Without Project

1. Intersection Capacity Utilization/Delay and Levels of Service

   The Intersection Capacity Utilization/delay and Levels of Service for Opening Year (2020) Without Project traffic conditions are shown in Table 6. As shown in Table 6, the study intersections are projected to operate within acceptable Levels of Service (D or better) during the peak hours for Opening Year (2020) Without Project traffic conditions.

C. Opening Year (2020) With Project

1. Intersection Capacity Utilization/Delay and Levels of Service

   The Intersection Capacity Utilization/delay and Levels of Service for Opening Year (2020) With Project traffic conditions are shown in Table 7. As shown in Table 7, the study intersections are projected to operate within acceptable Levels of Service (D or better) during the peak hours for Opening Year (2020) With Project traffic conditions.

2. Significant Impact Evaluation

   Table 8 evaluates the project impact at the study intersections for Opening Year (2020) With Project traffic conditions. As shown in Table 8, the proposed project is forecast to result in no significant traffic impacts at the study intersections for Opening Year (2020) With Project traffic conditions.

D. General Plan Buildout (Year 2040) Without Project

1. Intersection Capacity Utilization/Delay and Levels of Service

The Intersection Capacity Utilization/delay and Levels of Service for General Plan Buildout (Year 2040) Without Project traffic conditions are shown in Table 9. As shown in Table 9, the study intersections are projected to operate within acceptable Levels of Service (D or better) during the peak hours for General Plan Buildout (Year 2040) Without Project traffic conditions, except for the following study intersections:

- Orange Avenue/Spring Street - #1 (morning/evening peak hours)
- Orange Avenue/Willow Street - #2 (evening peak hour only)
- Cherry Avenue/Willow Street - #15 (evening peak hour only)

E. General Plan Buildout (Year 2040) With Project

1. Intersection Capacity Utilization/Delay and Levels of Service

The Intersection Capacity Utilization/delay and Levels of Service for General Plan Buildout (Year 2040) With Project traffic conditions, without and with mitigation, are shown in Table 10. As shown in Table 10, the study intersections are projected to operate within acceptable Levels of Service (D or better) during the peak hours for General Plan Buildout (Year 2040) With Project traffic conditions without mitigation, except for the following study intersections:

- Orange Avenue/Spring Street - #1 (morning/evening peak hours)
- Orange Avenue/Willow Street - #2 (morning/evening peak hours)
- Cherry Avenue/Willow Street - #15 (evening peak hour only)

2. Significant Impact Evaluation

Table 11 evaluates the project impact at the study intersections for General Plan Buildout (Year 2040) With Project traffic conditions. As shown in Table 11, the proposed project is forecast to result in no significant traffic impacts at the study intersections for General Plan Buildout (Year 2040) With Project traffic conditions.

Table 4

Existing Plus Project Intersection Capacity Utilization/Delay and Levels of Service

Intersection	Traffic Control[1]	Intersection Approach Lanes[2]												Peak Hour V/C [Delay]-LOS[3]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Orange Avenue (NS) at:															
Spring Street (EW) - #1	TS	1	2	1	1	1	1	1	2	d	1	2	d	0.810-D	0.818-D
Willow Street (EW) - #2	TS	1	1	1	1	1	1	1	2.5	0.5	1	2.5	0.5	0.748-C	0.865-D
Burnett Street (EW) - #3	TS	1	1	d	1	1	d	-	<1>	-	-	<1>	-	0.639-B	0.618-B
Hill Street (EW) - #4	TS	1	0.5	0.5	1	0.5	0.5	0.5	0.5	1	0.5	0.5	d	0.736-C	0.634-B
Pacific Coast Highway (EW) - #5	TS	1	2	1>	1	2	1	1	2.5	0.5	1	2.5	0.5	[23.2]-C	[21.5]-C
Gundry Avenue (NS) at:															
Hill Street (EW) - #6	CSS	0.5	-	0.5	-	-	-	-	0.5	0.5	0.5	0.5	-	[13.4]-B	[11.7]-B
Walnut Avenue (NS) at:															
Spring Street (EW) - #7	TS	1	1	d	1	0.5	0.5	1	1.5	0.5	1	1.5	0.5	0.626-B	0.660-B
Willow Street (EW) - #8	TS	1	1.5	0.5	1	2	d	1	2.5	0.5	1	2.5	0.5	0.509-A	0.652-B
Burnett Street (EW) - #9	AWS	0.5	0.5	d	0.5	0.5	d	-	<1>	-	-	<1>	-	[15.0]-B	[13.5]-B
Hill Street (EW) - #10	AWS	-	<1>	-	0.5	0.5	1	-	<1>	-	-	<1>	-	[14.3]-B	[13.4]-B
20th Street/Alamitos Avenue (EW) - #11	TS	1	0.5	0.5	1	0.5	0.5	-	<1>	-	-	<1>	-	0.588-A	0.521-A
Pacific Coast Highway (EW) - #12	TS	-	<1>	-	-	<1>	-	1	2.5	0.5	1	2.5	0.5	[10.0]-A	[10.9]-B
Gaviota Avenue (NS) at:															
Hill Street (EW) - #13	CSS	-	<1>	-	-	<1>	-	-	<1>	-	-	<1>	-	[12.2]-B	[13.0]-B
Cherry Avenue (NS) at:															
Spring Street (EW) - #14	TS	1	2.5	0.5	2	2.5	0.5	1	2.5	0.5	1	2.5	1.5	0.752-C	0.734-C
Willow Street (EW) - #15	TS	1	3	1>	2	2.5	0.5	2	2.5	0.5	2	2.5	0.5	0.719-C	0.859-D
Burnett Street (EW) - #16	TS	1	2	1	1	2	1	-	<1>	-	0.5	0.5	1	0.628-B	0.624-B
Hill Street (EW) - #17	TS	1	2	d	1	2	1	-	<1>	-	-	<1>	-	0.598-A	0.656-B
21st Street (EW) - #18	TS	1	2	d	1	2	1	0.5	0.5	d	1	0.5	0.5	0.655-B	0.601-B
20th Street (EW) - #19	TS	1	1.5	0.5	1	1.5	0.5	1	0.5	0.5	-	<1>	-	0.525-A	0.491-A
Pacific Coast Highway (EW) - #20	TS	1	1.5	0.5	1	2	1>	1	2.5	0.5	1	2.5	0.5	[28.4]-C	[25.3]-C

[1] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

[2] L = Left; T = Through; R = Right; d = De Facto Right Turn Lane; <1> = Shared Left/Through/Right Lane; > = Right Turn Overlap

[3] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; [Delay]-LOS is reported for intersections under California Department of Transportation jurisdiction and intersections with stop control. Per the Highway Capacity Manual, overall average intersection delay and LOS are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, Level of Service is based on average delay of the worst individual lane (or movements sharing a lane).

Table 5

Existing Plus Project Significant Impact Evaluation

Signalized Intersections							
	Peak Hour V/C [Delay]-LOS[1]				Change in V/C or Delay		Significant Impact?
	Without Project		With Project		Morning	Evening Peak	
Intersection	Morning	Evening	Morning	Evening	Peak Hour	Hour	
Orange Avenue (NS) at:							
Spring Street (EW) - #1	0.791-C	0.812-D	0.810-D	0.818-D	+0.019	+0.006	No
Willow Street (EW) - #2	0.733-C	0.846-D	0.748-C	0.865-D	+0.015	+0.019	No
Burnett Street (EW) - #3	0.633-B	0.608-B	0.639-B	0.618-B	+0.006	+0.010	No
Hill Street (EW) - #4	0.704-C	0.632-B	0.736-C	0.634-B	+0.032	+0.002	No *
Pacific Coast Highway (EW) - #5	[23.2]-C	[21.4]-C	[23.2]-C	[21.5]-C	0.0	+0.1	No
Walnut Avenue (NS) at:							
Spring Street (EW) - #7	0.621-B	0.656-B	0.626-B	0.660-B	+0.005	+0.004	No
Willow Street (EW) - #8	0.508-A	0.650-B	0.509-A	0.652-B	+0.001	+0.002	No
20th Street/Alamitos Avenue (EW) - #11	0.541-A	0.493-A	0.588-A	0.521-A	+0.047	+0.028	No *
Pacific Coast Highway (EW) - #12	[9.0]-A	[9.1]-A	[10.0]-A	[10.9]-B	+1.0	+1.8	No
Cherry Avenue (NS) at:							
Spring Street (EW) - #14	0.751-C	0.729-C	0.752-C	0.734-C	+0.001	+0.005	No
Willow Street (EW) - #15	0.714-C	0.853-D	0.719-C	0.859-D	+0.005	+0.006	No
Burnett Street (EW) - #16	0.624-B	0.608-B	0.628-B	0.624-B	+0.004	+0.016	No
Hill Street (EW) - #17	0.591-A	0.626-B	0.598-A	0.656-B	+0.007	+0.030	No *
21st Street (EW) - #18	0.653-B	0.593-A	0.655-B	0.601-B	+0.002	+0.008	No
20th Street (EW) - #19	0.525-A	0.491-A	0.525-A	0.491-A	0.000	0.000	No
Pacific Coast Highway (EW) - #20	[28.2]-C	[25.2]-C	[28.4]-C	[25.3]-C	+0.2	+0.1	No

Unsignalized Intersections							
	Peak Hour Delay-LOS						Significant Impact?
	Without Project		With Project		Acceptable	Traffic Signal	
Intersection	Morning	Evening	Morning	Evening	LOS?	Warranted?	
Gundry Avenue (NS) at:							
Hill Street (EW) - #6	12.5-B	11.0-B	13.4-B	11.7-B	Yes	-	No
Walnut Avenue (NS) at:							
Burnett Street (EW) - #9	14.9-B	13.3-B	15.0-B	13.5-B	Yes	-	No
Hill Street (EW) - #10	12.2-B	11.9-B	14.3-B	13.4-B	Yes	-	No
Gaviota Avenue (NS) at:							
Hill Street (EW) - #13	11.5-B	12.2-B	12.2-B	13.0-B	Yes	-	No

[1] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; see Tables 1 and 4.

* V/C increases by 0.02 or more; however, the intersection is forecast to operate within acceptable LOS. Therefore, the impact is considered less than significant and no mitigation is proposed.

Table 6

Opening Year (2020) Without Project Intersection Capacity Utilization/Delay and Levels of Service

Intersection	Traffic Control[1]	Intersection Approach Lanes[2]												Peak Hour V/C [Delay]-LOS[3]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Orange Avenue (NS) at:															
Spring Street (EW) - #1	TS	1	2	1	1	1	1	1	2	d	1	2	d	0.812-D	0.845-D
Willow Street (EW) - #2	TS	1	1	1	1	1	1	1	2.5	0.5	1	2.5	0.5	0.764-C	0.871-D
Burnett Street (EW) - #3	TS	1	1	d	1	1	d	-	<1>	-	-	<1>	-	0.668-B	0.635-B
Hill Street (EW) - #4	TS	1	0.5	0.5	1	0.5	0.5	0.5	0.5	1	0.5	0.5	d	0.736-C	0.666-B
Pacific Coast Highway (EW) - #5	TS	1	2	1>	1	2	1	1	2.5	0.5	1	2.5	0.5	[24.0]-C	[22.0]-C
Gundry Avenue (NS) at:															
Hill Street (EW) - #6	CSS	0.5	-	0.5	-	-	-	-	0.5	0.5	0.5	0.5	-	[12.9]-B	[11.2]-B
Walnut Avenue (NS) at:															
Spring Street (EW) - #7	TS	1	1	d	1	0.5	0.5	1	1.5	0.5	1	1.5	0.5	0.633-B	0.669-B
Willow Street (EW) - #8	TS	1	1.5	0.5	1	2	d	1	2.5	0.5	1	2.5	0.5	0.520-A	0.675-B
Burnett Street (EW) - #9	AWS	0.5	0.5	d	0.5	0.5	d	-	<1>	-	-	<1>	-	[17.2]-C	[14.8]-B
Hill Street (EW) - #10	AWS	-	<1>	-	0.5	0.5	1	-	<1>	-	-	<1>	-	[12.8]-B	[12.3]-B
20th Street/Alamitos Avenue (EW) - #11	TS	1	0.5	0.5	1	0.5	0.5	-	<1>	-	-	<1>	-	0.551-A	0.505-A
Pacific Coast Highway (EW) - #12	TS	-	<1>	-	-	<1>	-	1	2.5	0.5	1	2.5	0.5	[9.5]-A	[9.5]-A
Gaviota Avenue (NS) at:															
Hill Street (EW) - #13	CSS	-	<1>	-	-	<1>	-	-	<1>	-	-	<1>	-	[11.6]-B	[12.3]-B
Cherry Avenue (NS) at:															
Spring Street (EW) - #14	TS	1	2.5	0.5	2	2.5	0.5	1	2.5	0.5	1	2.5	1.5	0.768-C	0.744-C
Willow Street (EW) - #15	TS	1	3	1>	2	2.5	0.5	2	2.5	0.5	2	2.5	0.5	0.732-C	0.879-D
Burnett Street (EW) - #16	TS	1	2	1	1	2	1	-	<1>	-	0.5	0.5	1	0.641-B	0.625-B
Hill Street (EW) - #17	TS	1	2	d	1	2	1	-	<1>	-	-	<1>	-	0.609-B	0.642-B
21st Street (EW) - #18	TS	1	2	d	1	2	1	0.5	0.5	d	1	0.5	0.5	0.674-B	0.615-B
20th Street (EW) - #19	TS	1	1.5	0.5	1	1.5	0.5	1	0.5	0.5	-	<1>	-	0.541-A	0.505-A
Pacific Coast Highway (EW) - #20	TS	1	1.5	0.5	1	2	1>	1	2.5	0.5	1	2.5	0.5	[29.1]-C	[25.7]-C

[1] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

[2] L = Left; T = Through; R = Right; d = De Facto Right Turn Lane; <1> = Shared Left/Through/Right Lane; > = Right Turn Overlap

[3] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; [Delay]-LOS is reported for intersections under California Department of Transportation jurisdiction and intersections with stop control. Per the Highway Capacity Manual, overall average intersection delay and LOS are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, Level of Service is based on average delay of the worst individual lane (or movements sharing a lane).

Table 7

Opening Year (2020) With Project Intersection Capacity Utilization/Delay and Levels of Service

Intersection	Traffic Control[1]	Intersection Approach Lanes[2]												Peak Hour V/C [Delay]-LOS[3]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Orange Avenue (NS) at:															
Spring Street (EW) - #1	TS	1	2	1	1	1	1	1	2	d	1	2	d	0.832-D	0.851-D
Willow Street (EW) - #2	TS	1	1	1	1	1	1	1	2.5	0.5	1	2.5	0.5	0.773-C	0.890-D
Burnett Street (EW) - #3	TS	1	1	d	1	1	d	-	<1>	-	-	<1>	-	0.673-B	0.646-B
Hill Street (EW) - #4	TS	1	0.5	0.5	1	0.5	0.5	0.5	0.5	1	0.5	0.5	d	0.768-C	0.668-B
Pacific Coast Highway (EW) - #5	TS	1	2	1>	1	2	1	1	2.5	0.5	1	2.5	0.5	[24.0]-C	[22.1]-C
Gundry Avenue (NS) at:															
Hill Street (EW) - #6	CSS	0.5	-	0.5	-	-	-	-	0.5	0.5	0.5	0.5	-	[13.9]-B	[12.0]-B
Walnut Avenue (NS) at:															
Spring Street (EW) - #7	TS	1	1	d	1	0.5	0.5	1	1.5	0.5	1	1.5	0.5	0.638-B	0.674-B
Willow Street (EW) - #8	TS	1	1.5	0.5	1	2	d	1	2.5	0.5	1	2.5	0.5	0.520-A	0.677-B
Burnett Street (EW) - #9	AWS	0.5	0.5	d	0.5	0.5	d	-	<1>	-	-	<1>	-	[17.5]-C	[15.0]-B
Hill Street (EW) - #10	AWS	-	<1>	-	0.5	0.5	1	-	<1>	-	-	<1>	-	[15.4]-C	[14.0]-B
20th Street/Alamitos Avenue (EW) - #11	TS	1	0.5	0.5	1	0.5	0.5	-	<1>	-	-	<1>	-	0.598-A	0.531-A
Pacific Coast Highway (EW) - #12	TS	-	<1>	-	-	<1>	-	1	2.5	0.5	1	2.5	0.5	[10.7]-B	[11.4]-B
Gaviota Avenue (NS) at:															
Hill Street (EW) - #13	CSS	-	<1>	-	-	<1>	-	-	<1>	-	-	<1>	-	[12.4]-B	[13.2]-B
Cherry Avenue (NS) at:															
Spring Street (EW) - #14	TS	1	2.5	0.5	2	2.5	0.5	1	2.5	0.5	1	2.5	1.5	0.768-C	0.746-C
Willow Street (EW) - #15	TS	1	3	1>	2	2.5	0.5	2	2.5	0.5	2	2.5	0.5	0.737-C	0.885-D
Burnett Street (EW) - #16	TS	1	2	1	1	2	1	-	<1>	-	0.5	0.5	1	0.645-B	0.643-B
Hill Street (EW) - #17	TS	1	2	d	1	2	1	-	<1>	-	-	<1>	-	0.617-B	0.672-B
21st Street (EW) - #18	TS	1	2	d	1	2	1	0.5	0.5	d	1	0.5	0.5	0.675-B	0.622-B
20th Street (EW) - #19	TS	1	1.5	0.5	1	1.5	0.5	1	0.5	0.5	-	<1>	-	0.541-A	0.505-A
Pacific Coast Highway (EW) - #20	TS	1	1.5	0.5	1	2	1>	1	2.5	0.5	1	2.5	0.5	[29.0]-C	[25.8]-C

[1] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

[2] L = Left; T = Through; R = Right; d = De Facto Right Turn Lane; <1> = Shared Left/Through/Right Lane; > = Right Turn Overlap

[3] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; [Delay]-LOS is reported for intersections under California Department of Transportation jurisdiction and intersections with stop control. Per the Highway Capacity Manual, overall average intersection delay and LOS are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, Level of Service is based on average delay of the worst individual lane (or movements sharing a lane).

Table 8

Opening Year (2020) Significant Impact Evaluation

Signalized Intersections							
	Peak Hour V/C [Delay]-LOS[1]				Change in V/C or Delay		Significant Impact?
	Without Project		With Project				
Intersection	Morning	Evening	Morning	Evening	Morning Peak Hour	Evening Peak Hour	
Orange Avenue (NS) at:							
Spring Street (EW) - #1	0.812-D	0.845-D	0.832-D	0.851-D	+0.020	+0.006	No *
Willow Street (EW) - #2	0.764-C	0.871-D	0.773-C	0.890-D	+0.009	+0.019	No
Burnett Street (EW) - #3	0.668-B	0.635-B	0.673-B	0.646-B	+0.005	+0.011	No
Hill Street (EW) - #4	0.736-C	0.666-B	0.768-C	0.668-B	+0.032	+0.002	No *
Pacific Coast Highway (EW) - #5	[24.0]-C	[22.0]-C	[24.0]-C	[22.1]-C	0.0	+0.1	No
Walnut Avenue (NS) at:							
Spring Street (EW) - #7	0.633-B	0.669-B	0.638-B	0.674-B	+0.005	+0.005	No
Willow Street (EW) - #8	0.520-A	0.675-B	0.520-A	0.677-B	0.000	+0.002	No
20th Street/Alamitos Avenue (EW) - #11	0.551-A	0.505-A	0.598-A	0.531-A	+0.047	+0.026	No *
Pacific Coast Highway (EW) - #12	[9.5]-A	[9.5]-A	[10.7]-B	[11.4]-B	+1.2	+1.9	No
Cherry Avenue (NS) at:							
Spring Street (EW) - #14	0.768-C	0.744-C	0.768-C	0.746-C	0.000	+0.002	No
Willow Street (EW) - #15	0.732-C	0.879-D	0.737-C	0.885-D	+0.005	+0.006	No
Burnett Street (EW) - #16	0.641-B	0.625-B	0.645-B	0.643-B	+0.004	+0.018	No
Hill Street (EW) - #17	0.609-B	0.642-B	0.617-B	0.672-B	+0.008	+0.030	No *
21st Street (EW) - #18	0.674-B	0.615-B	0.675-B	0.622-B	+0.001	+0.007	No
20th Street (EW) - #19	0.541-A	0.505-A	0.541-A	0.505-A	0.000	0.000	No
Pacific Coast Highway (EW) - #20	[29.1]-C	[25.7]-C	[29.0]-C	[25.8]-C	-0.1	+0.1	No

Unsignalized Intersections							
	Peak Hour Delay-LOS						Significant Impact?
	Without Project		With Project		Acceptable LOS?	Traffic Signal Warranted?	
Intersection	Morning	Evening	Morning	Evening			
Gundry Avenue (NS) at:							
Hill Street (EW) - #6	12.9-B	11.2-B	13.9-B	12.0-B	Yes	-	No
Walnut Avenue (NS) at:							
Burnett Street (EW) - #9	17.2-C	14.8-B	17.5-C	15.0-B	Yes	-	No
Hill Street (EW) - #10	12.8-B	12.3-B	15.4-C	14.0-B	Yes	-	No
Gaviota Avenue (NS) at:							
Hill Street (EW) - #13	11.6-B	12.3-B	12.4-B	13.2-B	Yes	-	No

[1] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; see Tables 6 and 7.

* V/C increases by 0.02 or more; however, the intersection is forecast to operate within acceptable LOS. Therefore, the impact is considered less than significant and no mitigation is proposed.

Table 9

General Plan Buildout (Year 2040) Without Project
Intersection Capacity Utilization/Delay and Levels of Service

Intersection	Traffic Control[1]	Intersection Approach Lanes[2]												Peak Hour V/C [Delay]-LOS[3]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Orange Avenue (NS) at:															
Spring Street (EW) - #1	TS	1	2	1	1	1	1	1	2	d	1	2	d	0.950-E	0.988-E
Willow Street (EW) - #2	TS	1	1	1	1	1	1	1	2.5	0.5	1	2.5	0.5	0.890-D	1.020-F
Burnett Street (EW) - #3	TS	1	1	d	1	1	d	-	<1>	-	-	<1>	-	0.774-C	0.738-C
Hill Street (EW) - #4	TS	1	0.5	0.5	1	0.5	0.5	0.5	0.5	1	0.5	0.5	d	0.856-D	0.771-C
Pacific Coast Highway (EW) - #5	TS	1	2	1>	1	2	1	1	2.5	0.5	1	2.5	0.5	[29.0]-C	[27.4]-C
Gundry Avenue (NS) at:															
Hill Street (EW) - #6	CSS	0.5	-	0.5	-	-	-	-	0.5	0.5	0.5	0.5	-	[14.4]-B	[11.9]-B
Walnut Avenue (NS) at:															
Spring Street (EW) - #7	TS	1	1	d	1	0.5	0.5	1	1.5	0.5	1	1.5	0.5	0.737-C	0.780-C
Willow Street (EW) - #8	TS	1	1.5	0.5	1	2	d	1	2.5	0.5	1	2.5	0.5	0.602-B	0.785-C
Burnett Street (EW) - #9	AWS	0.5	0.5	d	0.5	0.5	d	-	<1>	-	-	<1>	-	[32.8]-D	[22.2]-C
Hill Street (EW) - #10	AWS	-	<1>	-	0.5	0.5	1	-	<1>	-	-	<1>	-	[17.3]-C	[16.0]-C
20th Street/Alamitos Avenue (EW) - #11	TS	1	0.5	0.5	1	0.5	0.5	-	<1>	-	-	<1>	-	0.619-B	0.563-A
Pacific Coast Highway (EW) - #12	TS	-	<1>	-	-	<1>	-	1	2.5	0.5	1	2.5	0.5	[13.5]-B	[12.9]-B
Gaviota Avenue (NS) at:															
Hill Street (EW) - #13	CSS	-	<1>	-	-	<1>	-	-	<1>	-	-	<1>	-	[12.3]-B	[13.4]-B
Cherry Avenue (NS) at:															
Spring Street (EW) - #14	TS	1	2.5	0.5	2	2.5	0.5	1	2.5	0.5	1	2.5	1.5	0.898-D	0.868-D
Willow Street (EW) - #15	TS	1	3	1>	2	2.5	0.5	2	2.5	0.5	2	2.5	0.5	0.855-D	1.030-F
Burnett Street (EW) - #16	TS	1	2	1	1	2	1	-	<1>	-	0.5	0.5	1	0.746-C	0.727-C
Hill Street (EW) - #17	TS	1	2	d	1	2	1	-	<1>	-	-	<1>	-	0.708-C	0.748-C
21st Street (EW) - #18	TS	1	2	d	1	2	1	0.5	0.5	d	1	0.5	0.5	0.784-C	0.714-C
20th Street (EW) - #19	TS	1	1.5	0.5	1	1.5	0.5	1	0.5	0.5	-	<1>	-	0.627-B	0.583-A
Pacific Coast Highway (EW) - #20	TS	1	1.5	0.5	1	2	1>	1	2.5	0.5	1	2.5	0.5	[40.6]-D	[31.3]-C

[1] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

[2] L = Left; T = Through; R = Right; d = De Facto Right Turn Lane; <1> = Shared Left/Through/Right Lane; > = Right Turn Overlap

[3] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; [Delay]-LOS is reported for intersections under California Department of Transportation jurisdiction and intersections with stop control. Per the Highway Capacity Manual, overall average intersection delay and LOS are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, Level of Service is based on average delay of the worst individual lane (or movements sharing a lane).

Table 10

General Plan Buildout (Year 2040) With Project
Intersection Capacity Utilization/Delay and Levels of Service

Intersection	Traffic Control[1]	Intersection Approach Lanes[2]												Peak Hour V/C [Delay]-LOS[3]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Orange Avenue (NS) at:															
Spring Street (EW) - #1	TS	1	2	1	1	1	1	1	2	d	1	2	d	0.969-E	0.994-E
Willow Street (EW) - #2	TS	1	1	1	1	1	1	1	2.5	0.5	1	2.5	0.5	0.898-D	1.039-F
Burnett Street (EW) - #3	TS	1	1	d	1	1	d	-	<1>	-	-	<1>	-	0.780-C	0.748-C
Hill Street (EW) - #4	TS	1	0.5	0.5	1	0.5	0.5	0.5	0.5	1	0.5	0.5	d	0.889-D	0.773-C
Pacific Coast Highway (EW) - #5	TS	1	2	1>	1	2	1	1	2.5	0.5	1	2.5	0.5	[29.1]-C	[27.6]-C
Gundry Avenue (NS) at:															
Hill Street (EW) - #6	CSS	0.5	-	0.5	-	-	-	-	0.5	0.5	0.5	0.5	-	[15.7]-C	[12.9]-B
Walnut Avenue (NS) at:															
Spring Street (EW) - #7	TS	1	1	d	1	0.5	0.5	1	1.5	0.5	1	1.5	0.5	0.742-C	0.785-C
Willow Street (EW) - #8	TS	1	1.5	0.5	1	2	d	1	2.5	0.5	1	2.5	0.5	0.602-B	0.787-C
Burnett Street (EW) - #9	AWS	0.5	0.5	d	0.5	0.5	d	-	<1>	-	-	<1>	-	[33.7]-D	[23.0]-C
Hill Street (EW) - #10	AWS	-	<1>	-	0.5	0.5	1	-	<1>	-	-	<1>	-	[23.9]-C	[19.7]-C
20th Street/Alamitos Avenue (EW) - #11	TS	1	0.5	0.5	1	0.5	0.5	-	<1>	-	-	<1>	-	0.666-B	0.586-A
Pacific Coast Highway (EW) - #12	TS	-	<1>	-	-	<1>	-	1	2.5	0.5	1	2.5	0.5	[17.9]-B	[15.8]-B
Gaviota Avenue (NS) at:															
Hill Street (EW) - #13	CSS	-	<1>	-	-	<1>	-	-	<1>	-	-	<1>	-	[13.3]-B	[14.5]-B
Cherry Avenue (NS) at:															
Spring Street (EW) - #14	TS	1	2.5	0.5	2	2.5	0.5	1	2.5	0.5	1	2.5	1.5	0.899-D	0.870-D
Willow Street (EW) - #15	TS	1	3	1>	2	2.5	0.5	2	2.5	0.5	2	2.5	0.5	0.860-D	1.036-F
Burnett Street (EW) - #16	TS	1	2	1	1	2	1	-	<1>	-	0.5	0.5	1	0.750-C	0.744-C
Hill Street (EW) - #17	TS	1	2	d	1	2	1	-	<1>	-	-	<1>	-	0.715-C	0.778-C
21st Street (EW) - #18	TS	1	2	d	1	2	1	0.5	0.5	d	1	0.5	0.5	0.786-C	0.722-C
20th Street (EW) - #19	TS	1	1.5	0.5	1	1.5	0.5	1	0.5	0.5	-	<1>	-	0.627-B	0.583-A
Pacific Coast Highway (EW) - #20	TS	1	1.5	0.5	1	2	1>	1	2.5	0.5	1	2.5	0.5	[41.5]-D	[31.5]-C

[1] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

[2] L = Left; T = Through; R = Right; d = De Facto Right Turn Lane; <1> = Shared Left/Through/Right Lane; > = Right Turn Overlap

[3] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; [Delay]-LOS is reported for intersections under California Department of Transportation jurisdiction and intersections with stop control. Per the Highway Capacity Manual, overall average intersection delay and LOS are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, Level of Service is based on average delay of the worst individual lane (or movements sharing a lane).

Table 11

General Plan Buildout (Year 2040) Significant Impact Evaluation

Signalized Intersections							
	Peak Hour V/C [Delay]-LOS[1]				Change in V/C or Delay		Significant Impact?
	Without Project		With Project				
Intersection	Morning	Evening	Morning	Evening	Morning Peak Hour	Evening Peak Hour	
Orange Avenue (NS) at:							
Spring Street (EW) - #1	0.950-E	0.988-E	0.969-E	0.994-E	+0.019	+0.006	No
Willow Street (EW) - #2	0.890-D	1.020-F	0.898-D	1.039-F	+0.008	+0.019	No
Burnett Street (EW) - #3	0.774-C	0.738-C	0.780-C	0.748-C	+0.006	+0.010	No
Hill Street (EW) - #4	0.856-D	0.771-C	0.889-D	0.773-C	+0.033	+0.002	No *
Pacific Coast Highway (EW) - #5	[29.0]-C	[27.4]-C	[29.1]-C	[27.6]-C	+0.1	+0.2	No
Walnut Avenue (NS) at:							
Spring Street (EW) - #7	0.737-C	0.780-C	0.742-C	0.785-C	+0.005	+0.005	No
Willow Street (EW) - #8	0.602-B	0.785-C	0.602-B	0.787-C	0.000	+0.002	No
20th Street/Alamitos Avenue (EW) - #11	0.619-B	0.563-A	0.666-B	0.586-A	+0.047	+0.023	No *
Pacific Coast Highway (EW) - #12	[13.5]-B	[12.9]-B	[17.9]-B	[15.8]-B	+4.4	+2.9	No
Cherry Avenue (NS) at:							
Spring Street (EW) - #14	0.898-D	0.868-D	0.899-D	0.870-D	+0.001	+0.002	No
Willow Street (EW) - #15	0.855-D	1.030-F	0.860-D	1.036-F	+0.005	+0.006	No
Burnett Street (EW) - #16	0.746-C	0.727-C	0.750-C	0.744-C	+0.004	+0.017	No
Hill Street (EW) - #17	0.708-C	0.748-C	0.715-C	0.778-C	+0.007	+0.030	No *
21st Street (EW) - #18	0.784-C	0.714-C	0.786-C	0.722-C	+0.002	+0.008	No
20th Street (EW) - #19	0.627-B	0.583-A	0.627-B	0.583-A	0.000	0.000	No
Pacific Coast Highway (EW) - #20	[40.6]-D	[31.3]-C	[41.5]-D	[31.5]-C	+0.9	+0.2	No

Unsignalized Intersections							
	Peak Hour Delay-LOS						Significant Impact?
	Without Project		With Project		Acceptable LOS?	Traffic Signal Warranted?	
Intersection	Morning	Evening	Morning	Evening			
Gundry Avenue (NS) at:							
Hill Street (EW) - #6	14.4-B	11.9-B	15.7-C	12.9-B	Yes	-	No
Walnut Avenue (NS) at:							
Burnett Street (EW) - #9	32.8-D	22.2-C	33.7-D	23.0-C	Yes	-	No
Hill Street (EW) - #10	17.3-C	16.0-C	23.9-C	19.7-C	Yes	-	No
Gaviota Avenue (NS) at:							
Hill Street (EW) - #13	12.3-B	13.4-B	13.3-B	14.5-B	Yes	-	No

[1] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; see Tables 9 and 10.

* V/C increases by 0.02 or more; however, the intersection is forecast to operate within acceptable LOS. Therefore, the impact is considered less than significant and no mitigation is proposed.

VII. CONGESTION MANAGEMENT PROGRAM

A. Congestion Management Program Screening Filter

In accordance with the 2010 Los Angeles County Congestion Management Program (CMP), the following criteria are used to determine if a Congestion Management Program monitored facility requires analysis for potential project-related transportation impacts:

- All Congestion Management Program arterial monitoring intersections, including monitored freeway on- or off-ramp intersections, where the proposed project will add 50 or more trips during either the morning or evening weekday peak hours;
- Mainline freeway monitoring locations where the project will add 150 or more trips, in either direction, during either the morning or evening weekday peak hours.

The proposed project is forecast to satisfy the above criteria for the Congestion Management Program monitored intersection of Orange Avenue at Pacific Coast Highway. The Congestion Management Program uses the Intersection Capacity Utilization methodology as previously described in the Methodology chapter.

B. Thresholds of Significance

A significant Congestion Management Program transportation impact is defined to occur if the proposed project increases traffic demand on a Congestion Management Program facility by 2% or more of capacity ($V/C \geq 0.02$), causing or worsening Level of Service F ($V/C > 1.00$).

C. Congestion Management Program Intersection Impact Evaluation

Table 12 shows a summary of the Congestion Management Program study intersection volume-to-capacity and Level of Service for the previously evaluated scenarios based on existing lane geometry. As shown in Table 12, the proposed project is forecast to result in no significant traffic impacts at Congestion Management Program monitored intersections for the evaluated scenarios.

Level of Service worksheets for the Congestion Management Program impact analysis are provided in Appendix D.

D. Congestion Management Program Transit Impact Review

The Congestion Management Program requires documentation of existing transit services in the project vicinity and estimation of the number of trips assigned to transit.

As discussed in the Existing Conditions chapter, Figure 5 shows the existing transit routes available in the project vicinity. As shown on Figure 5, Long Beach Transit Routes 171, 172, 173, and 174 run along Pacific Coast Highway, with bus stops located within 1/3-mile walking distance from the project site at Walnut Avenue. Long Beach Transit Routes 71 and 72 run along Orange Avenue, with bus stops located within approximately 1/4-mile walking

distance at Wesley Drive and 20th Street. Long Beach Transit Routes 21 and 22 run along Cherry Avenue, with bus stops located within approximately 1/4-mile walking distance at Alamitos Avenue/21st Street. A Metro Blue Line (light rail) station is located just over one mile west of the project site at Long Beach Boulevard/Pacific Coast Highway.

Table 13 shows the transit trip analysis in accordance with the Congestion Management Program requirements. The number of project trips assigned to transit is derived by converting the project generated vehicle trips (see Table 2) to person trips and applying the transit factors in accordance with the Congestion Management Program guidelines. Since there is fixed route service, but no Congestion Management Program transit corridors within one quarter mile of the project site, the default factor of 3.5% of total person trips generated was used to determine the number of trips assigned to transit.

As shown in Table 13, the proposed project is forecast to generate approximately 97 daily transit trips, including 8 transit trip during the morning peak hour and 9 transit trips during the evening peak hour.

Table 12

Congestion Management Program Impact Analysis

Existing Conditions							
	Peak Hour V/C-LOS[1]				Change in V/C		Significant Impact?
	Without Project		With Project				
Intersection	Morning	Evening	Morning	Evening	Morning Peak Hour	Evening Peak Hour	
Orange Avenue (NS) at: Pacific Coast Highway (EW) - #5	0.662-B	0.754-C	0.664-B	0.761-C	+0.002	+0.007	No

Opening Year (2020)							
	Peak Hour V/C-LOS[1]				Change in V/C		Significant Impact?
	Without Project		With Project				
Intersection	Morning	Evening	Morning	Evening	Morning Peak Hour	Evening Peak Hour	
Orange Avenue (NS) at: Pacific Coast Highway (EW) - #5	0.684-B	0.772-C	0.686-B	0.779-C	+0.002	+0.007	No

General Plan Buildout (Year 2040)							
	Peak Hour V/C-LOS[1]				Change in V/C		Significant Impact?
	Without Project		With Project				
Intersection	Morning	Evening	Morning	Evening	Morning Peak Hour	Evening Peak Hour	
Orange Avenue (NS) at: Pacific Coast Highway (EW) - #5	0.797-C	0.872-D	0.798-C	0.879-D	+0.001	+0.007	No

[1] V/C = Volume/Capacity; LOS = Level of Service.

Table 13

Congestion Management Program Transit Trips Analysis

Project Trip Generation		Vehicle to Person Trips Factor[1]	Percent of Total Person Trips[1]	Trips Generated						
				Morning Peak Hour			Evening Peak Hour			
				In	Out	Total	In	Out	Total	Daily
Vehicle Trip Generation[2]	Passenger Cars			153	27	180	48	134	182	1,972
Transit Trip Generation[3]	Person Trips Generated	1.4	-	214	38	252	67	188	255	2,761
	Transit Trips Generated	-	3.5%	7	1	8	2	7	9	97

[1] Source: Los Angeles County Metropolitan Transportation Authority,2010 Congestion Management Program, Appendix D - Section D.8.4.

[2] See Table 2.

[3] Transit trip generation is calculated for passenger cars only.

VIII. GENERAL PLAN AMENDMENT/ZONE CHANGE ASSESSMENT

The western portion of the project site is currently zoned Light Industrial. The eastern portion of the project site is currently zoned Commercial Office and therefore requires a zone change to Light Industrial. For informational purposes, a trip generation comparison has been prepared for the eastern portion of the project site to assess the difference in trips associated with the proposed General Plan Amendment/Zone Change.

The eastern portion of the proposed project consists of four buildings totaling 37,090 square feet plus 5,000 square feet of mezzanine, for a total of 42,090 square feet of gross floor area.

A. Trip Generation for Eastern Project Site

Table 14 shows the trip generation forecast for the eastern portion of the project site only based upon regression/linear equations obtained from the Institute of Transportation Engineers, Trip Generation Manual, 10th Edition, 2017. As shown in Table 14, the eastern portion of the project site is forecast to generate a total of approximately 1,337 daily trips in passenger car equivalents, including 70 passenger car equivalent trips during the morning peak hour and 78 passenger car equivalent trips during the evening peak hour.

B. Trip Generation for Comparable Commercial Office Land Use

Table 15 shows the trip generation for a commercial office development of comparable size based upon regression/linear equations obtained from the Institute of Transportation Engineers, Trip Generation Manual, 10th Edition, 2017. As shown in Table 15, a commercial office development of comparable size is forecast to generate a total of approximately 458 daily trips, including 66 trips during the morning peak hour and 50 trips during the evening peak hour.

C. Trip Generation Comparison

Table 16 shows a comparison of trips forecast to be generated between the proposed eastern project site and a commercial office development of comparable size. As shown in Table 16, the proposed business park land use is forecast to generate approximately 879 more daily trips than a commercial office use, including 4 more trips during the morning peak hour and 28 more trips during the evening peak hour.

Table 14

Trip Generation for Eastern Project Site

Land Use	Source[1]	Setting[2]	Trip Generation Equations[3]	Directional Distribution	
				Inbound	Outbound
Business Park	ITE 770	GU/S			
Morning Peak Hour			Ln(T) = 0.97 Ln(X) + 0.49	85%	15%
Evening Peak Hour			Ln(T) = 0.90 Ln(X) + 0.85	26%	74%
Daily			T = 10.62 (X) + 715.67	50%	50%

Land Use/Time Period	Quantity	Units[4]	Vehicle Trips Generated		
			Total	Inbound	Outbound
Business Park	42.090	TSF			
Morning Peak Hour			61	52	9
Cars (85%)			52	44	8
Trucks (15%)			9	8	1
Evening Peak Hour			68	18	50
Cars (85%)			58	15	43
Trucks (15%)			10	3	7
Daily			1,163	582	581
Cars (85%)			989	495	494
Trucks (15%)			174	87	87

Time Period	PCE Factor	PCE Trips Generated[5]		
		Total	Inbound	Outbound
Morning Peak Hour				
Cars	1.0	52	44	8
Trucks	2.0	18	16	2
Total		**70**	**60**	**10**
Evening Peak Hour				
Cars	1.0	58	15	43
Trucks	2.0	20	6	14
Total		**78**	**21**	**57**
Daily				
Cars	1.0	989	495	494
Trucks	2.0	348	174	174
Total		**1,337**	**669**	**668**

[1] ITE = Institute of Transportation Engineers,Trip Generation Manual, 10th Edition, 2017; ### = Land Use Code

[2] GU/S = General Urban/Suburban

[3] T = Trips; X = Thousand Square Feet

[4] TSF = Thousand Square Feet

[5] PCE = Passenger Car Equivalent

Table 15

Trip Generation for Comparable Commercial Office Land Use

Land Use	Source[1]	Setting[2]	Trip Generation Equations[3]	Directional Distribution	
				Inbound	Outbound
General Office	ITE 710	GU/S			
Morning Peak Hour			T = 0.94 (X) + 26.49	86%	14%
Evening Peak Hour			Ln(T) = 0.95 Ln(X) + 0.36	16%	84%
Daily			Ln(T) = 0.97 Ln(X) + 2.50	50%	50%

Land Use/Time Period	Quantity	Units[4]	Vehicle Trips Generated		
			Total	Inbound	Outbound
General Office	42.090	TSF			
Morning Peak Hour			66	57	9
Evening Peak Hour			50	8	42
Daily			458	229	229

[1] ITE = Institute of Transportation Engineers,Trip Generation Manual, 10th Edition, 2017; ### = Land Use Code

[2] GU/S = General Urban/Suburban

[3] T = Trips; X = Thousand Square Feet

[4] TSF = Thousand Square Feet

Table 16

Trip Generation Comparison for Proposed Zone Change

Land Use	Quantity	Units[1]	Morning Peak Hour			Evening Peak Hour			Daily
			Inbound	Outbound	Total	Inbound	Outbound	Total	
[A] Commercial Office	42.090	TSF	57	9	66	8	42	50	458
[B] Business Park[2]	42.090	TSF	60	10	70	21	57	78	1,337
Net Change ([B] - [A])			+3	+1	+4	+13	+15	+28	+879

[1] TSF = Thousand Square Feet

[2] Based on Passenger Car Equivalent (PCE) trips.

IX. CONCLUSIONS

A. Off-Site Mitigation Measures

No off-site mitigation measure improvements were identified since the proposed project is forecast to result in no significant traffic impacts at the study intersections for the scenarios analyzed.

B. Circulation Recommendations

Site-specific circulation and access recommendations are depicted on Figure 39.

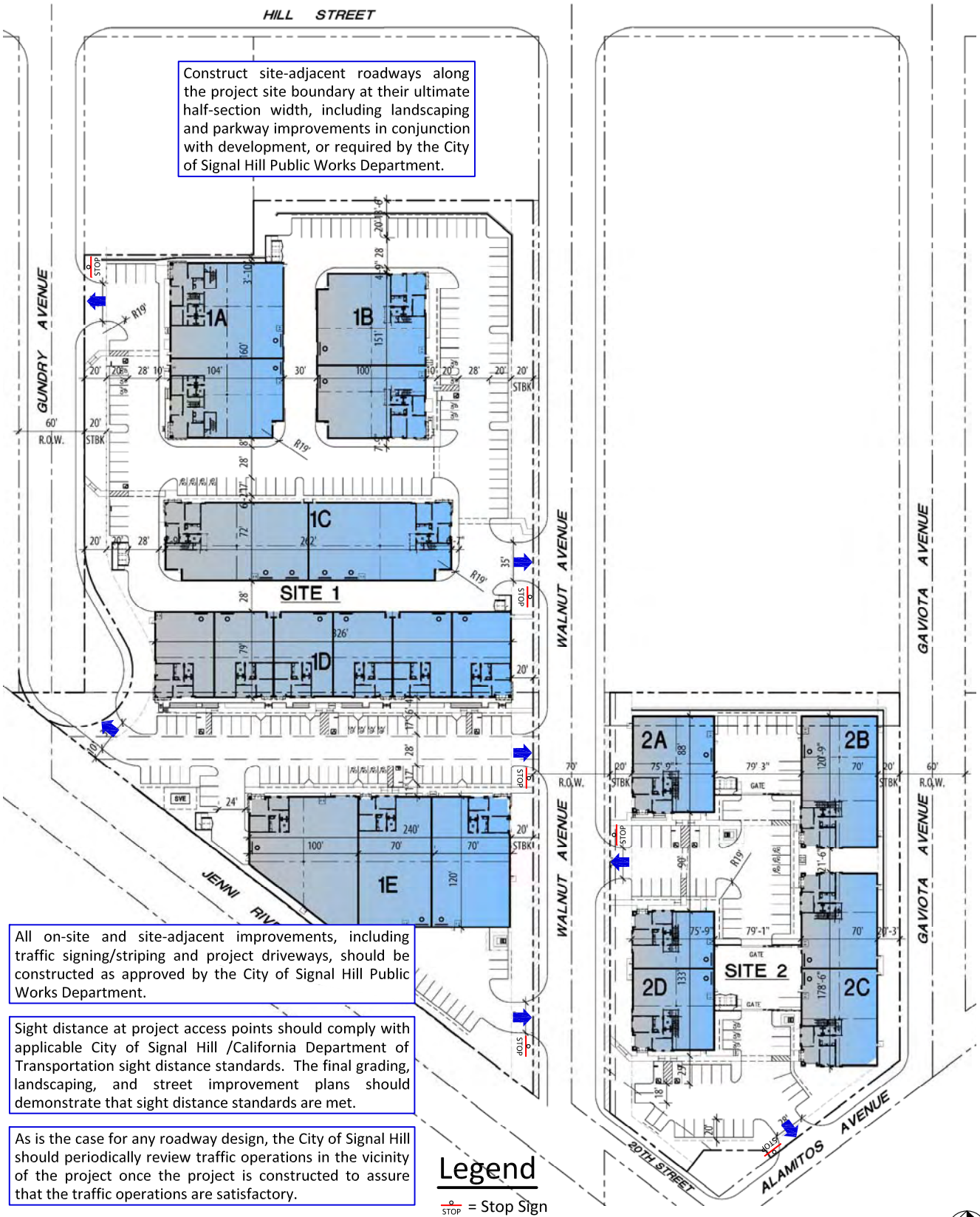
Construct site-adjacent roadways along the project site boundary at their ultimate half-section width, including landscaping and parkway improvements in conjunction with development, or required by the City of Signal Hill Public Works Department.

All on-site and site-adjacent improvements, including traffic signing/striping and project driveways, should be constructed as approved by the City of Signal Hill Public Works Department.

Sight distance at project access points should comply with applicable City of Signal Hill /California Department of Transportation sight distance standards. The final grading, landscaping, and street improvement plans should demonstrate that sight distance standards are met.

As is the case for any roadway design, the City of Signal Hill should periodically review traffic operations in the vicinity of the project once the project is constructed to assure that the traffic operations are satisfactory.

Figure 39
Circulation Recommendations



APPENDICES

Appendix A Glossary of Transportation Terms

Appendix B Intersection Turning Movement Count Worksheets

Appendix C Intersection Level of Service Worksheets

Appendix D Congestion Management Program Level of Service Worksheets

APPENDIX A

Glossary of Transportation Terms

GLOSSARY OF TRANSPORTATION TERMS

COMMON ABBREVIATIONS

AC:	Acres
ADT:	Average Daily Traffic
Caltrans:	California Department of Transportation
DU:	Dwelling Unit
ICU:	Intersection Capacity Utilization
LOS:	Level of Service
TSF:	Thousand Square Feet
V/C:	Volume/Capacity
VMT:	Vehicle Miles Traveled

TERMS

AVERAGE DAILY TRAFFIC: The total volume during a year divided by the number of days in a year. Usually only weekdays are included.

BANDWIDTH: The number of seconds of green time available for through traffic in a signal progression.

BOTTLENECK: A constriction along a travelway that limits the amount of traffic that can proceed downstream from its location.

CAPACITY: The maximum number of vehicles that can be reasonably expected to pass over a given section of a lane or a roadway in a given time period.

CHANNELIZATION: The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movements of both vehicles and pedestrians.

CLEARANCE INTERVAL: Nearly same as yellow time. If there is an all red interval after the end of a yellow, then that is also added into the clearance interval.

CORDON: An imaginary line around an area across which vehicles, persons, or other items are counted (in and out).

CYCLE LENGTH: The time period in seconds required for one complete signal cycle.

CUL-DE-SAC STREET: A local street open at one end only, and with special provisions for turning around.

DAILY CAPACITY: The daily volume of traffic that will result in a volume during the peak hour equal to the capacity of the roadway.

DELAY: The time consumed while traffic is impeded in its movement by some element over which it has no control, usually expressed in seconds per vehicle.

DEMAND RESPONSIVE SIGNAL: Same as traffic-actuated signal.

DENSITY: The number of vehicles occupying in a unit length of the through traffic lanes of a roadway at any given instant. Usually expressed in vehicles per mile.

DETECTOR: A device that responds to a physical stimulus and transmits a resulting impulse to the signal controller.

DESIGN SPEED: A speed selected for purposes of design. Features of a highway, such as curvature, superelevation, and sight distance (upon which the safe operation of vehicles is dependent) are correlated to design speed.

DIRECTIONAL SPLIT: The percent of traffic in the peak direction at any point in time.

DIVERSION: The rerouting of peak hour traffic to avoid congestion.

FORCED FLOW: Opposite of free flow.

FREE FLOW: Volumes are well below capacity. Vehicles can maneuver freely and travel is unimpeded by other traffic.

GAP: Time or distance between successive vehicles in a traffic stream, rear bumper to front bumper.

HEADWAY: Time or distance spacing between successive vehicles in a traffic stream, front bumper to front bumper.

INTERCONNECTED SIGNAL SYSTEM: A number of intersections that are connected to achieve signal progression.

LEVEL OF SERVICE: A qualitative measure of a number of factors, which include speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs.

LOOP DETECTOR: A vehicle detector consisting of a loop of wire embedded in the roadway, energized by alternating current and producing an output circuit closure when passed over by a vehicle.

MINIMUM ACCEPTABLE GAP: Smallest time headway between successive vehicles in a traffic stream into which another vehicle is willing and able to cross or merge.

MULTI-MODAL: More than one mode; such as automobile, bus transit, rail rapid transit, and bicycle transportation modes.

OFFSET: The time interval in seconds between the beginning of green at one intersection and the beginning of green at an adjacent intersection.

PLATOON: A closely grouped component of traffic that is composed of several vehicles moving, or standing ready to move, with clear spaces ahead and behind.

PASSENGER CAR EQUIVALENTS (PCE): One car is one Passenger Car Equivalent. A truck is equal to 2 or 3 Passenger Car Equivalents in that a truck requires longer to start, goes slower, and accelerates slower. Loaded trucks have a higher Passenger Car Equivalent than empty trucks.

PEAK HOUR: The 60 consecutive minutes with the highest number of vehicles.

PRETIMED SIGNAL: A type of traffic signal that directs traffic to stop and go on a predetermined time schedule without regard to traffic conditions. Also, fixed time signal.

PROGRESSION: A term used to describe the progressive movement of traffic through several signalized intersections.

SCREEN-LINE: An imaginary line or physical feature across which all trips are counted, normally to verify the validity of mathematical traffic models.

SIGNAL CYCLE: The time period in seconds required for one complete sequence of signal indications.

SIGNAL PHASE: The part of the signal cycle allocated to one or more traffic movements.

STARTING DELAY: The delay experienced in initiating the movement of queued traffic from a stop to an average running speed through a signalized intersection.

TRAFFIC-ACTUATED SIGNAL: A type of traffic signal that directs traffic to stop and go in accordance with the demands of traffic, as registered by the actuation of detectors.

TRIP: The movement of a person or vehicle from one location (origin) to another (destination). For example, from home to store to home is two trips, not one.

TRIP-END: One end of a trip at either the origin or destination (i.e., each trip has two trip-ends). A trip-end occurs when a person, object, or message is transferred to or from a vehicle.

TRIP GENERATION RATE: The quantity of trips produced and/or attracted by a specific land use stated in terms of units such as per dwelling, per acre, and per 1,000 square feet of floor space.

TRUCK: A vehicle having dual tires on one or more axles, or having more than two axles.

UNBALANCED FLOW: Heavier traffic flow in one direction than the other. On a daily basis, most facilities have balanced flow. During the peak hours, flow is seldom balanced in an urban area.

VEHICLE MILES OF TRAVEL: A measure of the amount of usage of a section of highway, obtained by multiplying the average daily traffic by length of facility in miles.

APPENDIX B

Intersection Turning Movement Count Worksheets

INTERSECTION TURNING MOVEMENT COUNTS

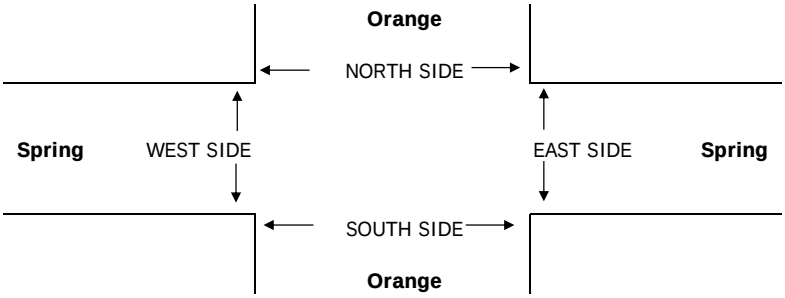
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1581
Thu, Jan 11, 18	NORTH & SOUTH:	Orange	LOCATION #:	1
	EAST & WEST:	Spring	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Orange			SOUTHBOUND Orange			EASTBOUND Spring			WESTBOUND Spring			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 1	SR 1	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL
AM	7:00 AM	7	110	5	13	114	30	14	87	8	16	131	22	557
	7:15 AM	4	111	13	22	113	34	27	150	15	18	224	39	770
	7:30 AM	9	144	20	21	151	29	19	162	16	31	220	32	854
	7:45 AM	6	174	13	23	135	35	26	163	19	34	274	42	944
	8:00 AM	9	150	11	33	119	32	16	135	15	24	224	28	796
	8:15 AM	7	119	12	21	111	26	13	146	10	16	242	25	748
	8:30 AM	10	144	23	28	98	46	15	133	13	12	179	20	721
	8:45 AM	13	124	8	31	111	32	24	137	12	16	210	24	742
	VOLUMES	65	1,076	105	192	952	264	154	1,113	108	167	1,704	232	6,132
	APPROACH %	5%	86%	8%	14%	68%	19%	11%	81%	8%	8%	81%	11%	
	APP/DEPART	1,246	/	1,463	1,408	/	1,228	1,375	/	1,408	2,103	/	2,033	0
	BEGIN PEAK HR		7:15 AM											
	VOLUMES	28	579	57	99	518	130	88	610	65	107	942	141	3,364
	APPROACH %	4%	87%	9%	13%	69%	17%	12%	80%	9%	9%	79%	12%	
	PEAK HR FACTOR		0.860			0.929			0.917			0.850		0.891
	APP/DEPART	664	/	807	747	/	691	763	/	766	1,190	/	1,100	0
PM	4:00 PM	12	138	21	28	143	60	32	230	9	13	227	56	969
	4:15 PM	10	141	17	19	114	29	30	234	20	13	163	43	833
	4:30 PM	9	142	18	30	125	44	39	231	10	12	144	45	849
	4:45 PM	18	144	11	27	149	43	30	215	14	11	163	33	858
	5:00 PM	21	141	9	25	141	44	25	239	16	13	163	41	878
	5:15 PM	10	159	20	20	149	59	35	250	14	14	192	41	963
	5:30 PM	15	120	15	31	134	46	27	242	14	6	165	33	848
	5:45 PM	15	129	15	29	125	43	30	216	27	16	149	35	829
	VOLUMES	110	1,114	126	209	1,080	368	248	1,857	124	98	1,366	327	7,027
	APPROACH %	8%	83%	9%	13%	65%	22%	11%	83%	6%	5%	76%	18%	
	APP/DEPART	1,350	/	1,694	1,657	/	1,303	2,229	/	2,187	1,791	/	1,843	0
	BEGIN PEAK HR		4:30 PM											
	VOLUMES	58	586	58	102	564	190	129	935	54	50	662	160	3,548
	APPROACH %	8%	83%	8%	12%	66%	22%	12%	84%	5%	6%	76%	18%	
	PEAK HR FACTOR		0.929			0.939			0.935			0.883		0.921
	APP/DEPART	702	/	879	856	/	668	1,118	/	1,091	872	/	910	0



INTERSECTION TURNING MOVEMENT COUNTS

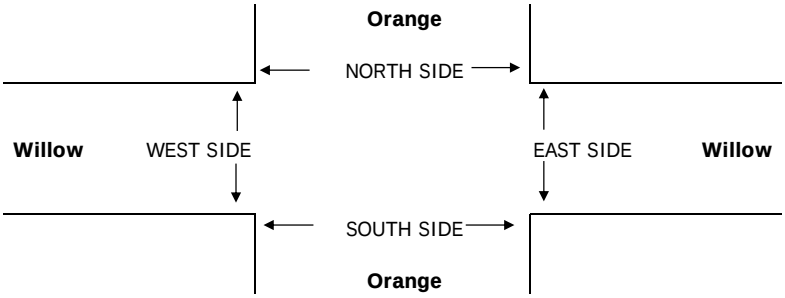
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1581
Thu, Jan 11, 18	NORTH & SOUTH:	Orange	LOCATION #:	2
	EAST & WEST:	Willow	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Orange			SOUTHBOUND Orange			EASTBOUND Willow			WESTBOUND Willow			
	LANES:	NL 1	NT 1	NR 1	SL 1	ST 1	SR 1	EL 1	ET 3	ER 0	WL 1	WT 3	WR 0	TOTAL
AM	7:00 AM	20	82	20	3	72	30	26	154	10	18	248	10	693
	7:15 AM	16	109	18	7	110	21	13	201	13	10	261	19	798
	7:30 AM	24	110	14	8	127	15	14	242	27	21	315	20	937
	7:45 AM	30	145	20	7	105	28	27	243	18	10	277	8	918
	8:00 AM	13	115	31	9	94	24	23	240	14	14	308	22	907
	8:15 AM	15	122	27	16	113	16	20	206	13	24	228	12	812
	8:30 AM	12	106	10	9	91	14	33	243	15	30	219	14	796
	8:45 AM	9	108	15	19	118	15	35	168	16	38	208	25	774
	VOLUMES	139	897	155	78	830	163	191	1,697	126	165	2,064	130	6,635
	APPROACH %	12%	75%	13%	7%	77%	15%	9%	84%	6%	7%	87%	6%	
	APP/DEPART	1,191	/	1,212	1,071	/	1,119	2,014	/	1,932	2,359	/	2,372	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	82	492	92	40	439	83	84	931	72	69	1,128	62	3,574
	APPROACH %	12%	74%	14%	7%	78%	15%	8%	86%	7%	5%	90%	5%	
	PEAK HR FACTOR		0.854			0.937			0.944			0.884		0.954
	APP/DEPART	666	/	636	562	/	580	1,087	/	1,063	1,259	/	1,295	0
PM	4:00 PM	15	104	20	14	139	17	32	281	14	32	241	17	926
	4:15 PM	9	92	16	22	110	12	21	366	15	22	273	21	979
	4:30 PM	17	111	22	17	134	29	18	315	17	30	240	22	972
	4:45 PM	13	113	28	10	105	20	15	377	16	29	268	21	1,015
	5:00 PM	12	114	25	26	126	18	27	347	21	32	257	18	1,023
	5:15 PM	7	108	28	18	128	13	27	393	21	36	309	25	1,113
	5:30 PM	19	125	20	19	141	16	20	334	16	38	243	17	1,008
	5:45 PM	18	99	27	15	115	14	27	359	16	34	246	22	992
	VOLUMES	110	866	186	141	998	139	187	2,772	136	253	2,077	163	8,028
	APPROACH %	9%	75%	16%	11%	78%	11%	6%	90%	4%	10%	83%	7%	
	APP/DEPART	1,162	/	1,213	1,278	/	1,386	3,095	/	3,100	2,493	/	2,329	0
	BEGIN PEAK HR		4:45 PM											
	VOLUMES	51	460	101	73	500	67	89	1,451	74	135	1,077	81	4,159
	APPROACH %	8%	75%	17%	11%	78%	10%	6%	90%	5%	10%	83%	6%	
	PEAK HR FACTOR		0.933			0.909			0.915			0.874		0.934
	APP/DEPART	612	/	628	640	/	708	1,614	/	1,626	1,293	/	1,197	0



INTERSECTION TURNING MOVEMENT COUNTS

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

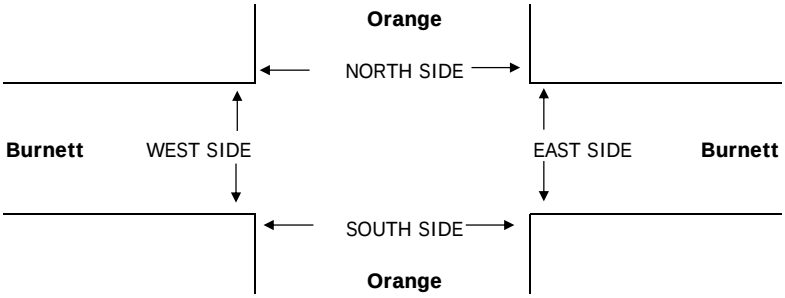
DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1581
Thu, Jan 11, 18	NORTH & SOUTH:	Orange	LOCATION #:	3
	EAST & WEST:	Burnett	CONTROL:	SIGNAL

NOTES:

PM NB queue

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

		NORTHBOUND (Orange)			SOUTHBOUND (Orange)			EASTBOUND (Burnett)			WESTBOUND (Burnett)			
	LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
AM	7:00 AM	1	118	2	4	91	0	2	9	1	5	4	6	243
	7:15 AM	5	129	6	5	109	2	5	10	5	13	4	6	299
	7:30 AM	2	156	4	9	171	1	9	27	11	19	16	6	431
	7:45 AM	9	163	12	11	112	1	5	40	11	21	17	6	408
	8:00 AM	7	155	8	5	124	3	7	21	4	9	23	7	373
	8:15 AM	3	142	6	7	129	6	3	8	2	8	8	3	325
	8:30 AM	1	122	5	10	121	6	10	17	3	7	11	7	320
	8:45 AM	1	111	5	9	146	8	6	14	5	6	14	6	331
	VOLUMES	29	1,096	48	60	1,003	27	47	146	42	88	97	47	2,730
	APPROACH %	2%	93%	4%	6%	92%	2%	20%	62%	18%	38%	42%	20%	
	APP/DEPART	1,173	/	1,190	1,090	/	1,134	235	/	254	232	/	152	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	21	616	30	32	536	11	24	96	28	57	64	22	1,537
	APPROACH %	3%	92%	4%	6%	93%	2%	16%	65%	19%	40%	45%	15%	
	PEAK HR FACTOR		0.906			0.800			0.661			0.813		0.892
	APP/DEPART	667	/	662	579	/	621	148	/	158	143	/	96	0
PM	4:00 PM	5	114	9	8	144	8	0	7	6	7	20	10	338
	4:15 PM	3	116	6	11	151	5	6	7	5	12	11	8	341
	4:30 PM	7	135	9	14	145	4	2	10	3	7	16	12	364
	4:45 PM	3	137	7	5	157	5	3	11	4	11	13	6	362
	5:00 PM	3	139	9	11	146	4	5	6	5	12	15	10	365
	5:15 PM	2	136	11	6	175	6	5	13	8	10	14	6	392
	5:30 PM	3	156	7	7	155	11	3	15	2	12	18	9	398
	5:45 PM	2	121	8	2	173	8	4	13	5	6	19	5	366
	VOLUMES	28	1,054	66	64	1,246	51	28	82	38	77	126	66	2,926
	APPROACH %	2%	92%	6%	5%	92%	4%	19%	55%	26%	29%	47%	25%	
	APP/DEPART	1,148	/	1,148	1,361	/	1,361	148	/	212	269	/	205	0
	BEGIN PEAK HR		5:00 PM											
	VOLUMES	10	552	35	26	649	29	17	47	20	40	66	30	1,521
	APPROACH %	2%	92%	6%	4%	92%	4%	20%	56%	24%	29%	49%	22%	
	PEAK HR FACTOR		0.899			0.941			0.808			0.872		0.955
	APP/DEPART	597	/	599	704	/	709	84	/	108	136	/	105	0



INTERSECTION TURNING MOVEMENT COUNTS

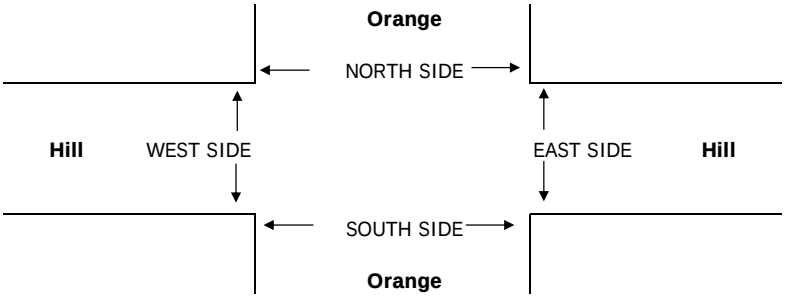
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1581
Thu, Jan 11, 18	NORTH & SOUTH:	Orange	LOCATION #:	4
	EAST & WEST:	Hill	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Orange			SOUTHBOUND Orange			EASTBOUND Hill			WESTBOUND Hill			
	LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 0	EL 0	ET 1	ER 1	WL 0	WT 1	WR 0	TOTAL
AM	7:00 AM	6	102	4	4	69	7	13	8	4	6	8	10	241
	7:15 AM	3	122	3	2	106	3	21	17	6	7	12	13	315
	7:30 AM	7	176	7	5	159	4	26	27	11	11	34	16	483
	7:45 AM	15	186	8	10	126	6	33	32	8	16	44	23	507
	8:00 AM	9	150	4	9	112	4	10	16	8	18	30	12	382
	8:15 AM	9	155	3	4	129	11	9	15	11	2	16	6	370
	8:30 AM	9	118	1	7	120	6	7	39	9	4	17	6	343
	8:45 AM	7	106	2	8	138	9	7	54	12	4	30	4	381
	VOLUMES	65	1,115	32	49	959	50	126	208	69	68	191	90	3,022
	APPROACH %	5%	92%	3%	5%	91%	5%	31%	52%	17%	19%	55%	26%	
	APP/DEPART	1,212	/	1,331	1,058	/	1,096	403	/	289	349	/	306	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	40	667	22	28	526	25	78	90	38	47	124	57	1,742
	APPROACH %	5%	91%	3%	5%	91%	4%	38%	44%	18%	21%	54%	25%	
	PEAK HR FACTOR		0.872			0.862			0.705			0.687		0.859
	APP/DEPART	729	/	802	579	/	611	206	/	140	228	/	189	0
PM	4:00 PM	7	117	4	10	140	12	3	30	8	8	24	7	370
	4:15 PM	16	129	4	4	136	7	9	30	7	3	30	5	380
	4:30 PM	9	137	4	10	132	12	9	28	12	5	23	6	387
	4:45 PM	10	141	10	5	135	7	8	13	11	6	12	8	366
	5:00 PM	8	139	9	4	140	9	7	23	8	10	27	6	390
	5:15 PM	6	135	8	7	153	11	7	37	6	10	30	12	422
	5:30 PM	12	160	8	9	145	9	14	24	7	12	25	9	434
	5:45 PM	5	129	8	7	154	14	8	23	9	10	21	7	395
	VOLUMES	73	1,087	55	56	1,135	81	65	208	68	64	192	60	3,144
	APPROACH %	6%	89%	5%	4%	89%	6%	19%	61%	20%	20%	61%	19%	
	APP/DEPART	1,215	/	1,212	1,272	/	1,267	341	/	319	316	/	346	0
	BEGIN PEAK HR		5:00 PM											
	VOLUMES	31	563	33	27	592	43	36	107	30	42	103	34	1,641
	APPROACH %	5%	90%	5%	4%	89%	6%	21%	62%	17%	23%	58%	19%	
	PEAK HR FACTOR		0.871			0.946			0.865			0.861		0.945
	APP/DEPART	627	/	633	662	/	664	173	/	167	179	/	177	0



INTERSECTION TURNING MOVEMENT COUNTS

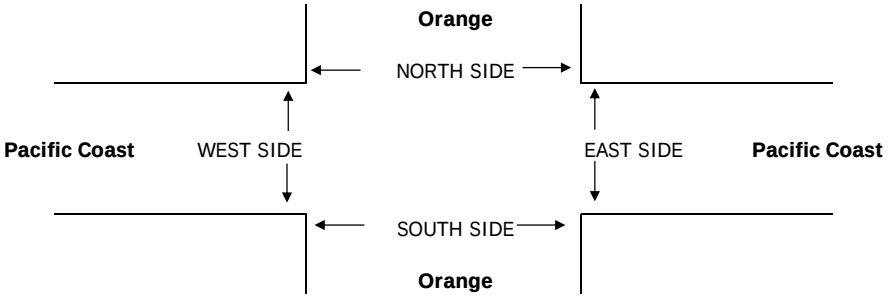
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1581
Thu, Jan 11, 18	NORTH & SOUTH:	Orange	LOCATION #:	5
	EAST & WEST:	Pacific Coast	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Orange			SOUTHBOUND Orange			EASTBOUND Pacific Coast			WESTBOUND Pacific Coast			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 3	ER 0	WL 1	WT 3	WR 0	TOTAL
AM	7:00 AM	17	66	21	11	51	22	10	131	13	33	283	11	669
	7:15 AM	23	104	31	21	74	26	19	197	11	43	352	10	911
	7:30 AM	25	133	53	7	97	40	31	220	17	71	351	30	1,075
	7:45 AM	25	138	70	10	89	17	33	264	28	69	348	38	1,129
	8:00 AM	25	136	44	15	85	18	21	183	11	56	309	23	926
	8:15 AM	23	106	41	15	86	17	27	202	19	38	284	31	889
	8:30 AM	18	99	30	16	75	32	23	200	18	38	274	33	856
	8:45 AM	17	89	42	24	90	24	23	194	12	55	275	31	876
	VOLUMES	173	871	332	119	647	196	187	1,591	129	403	2,476	207	7,331
	APPROACH %	13%	63%	24%	12%	67%	20%	10%	83%	7%	13%	80%	7%	
	APP/DEPART	1,376	/	1,265	962	/	1,179	1,907	/	2,042	3,086	/	2,845	0
	BEGIN PEAK HR		7:15 AM											
	VOLUMES	98	511	198	53	345	101	104	864	67	239	1,360	101	4,041
	APPROACH %	12%	63%	25%	11%	69%	20%	10%	83%	6%	14%	80%	6%	
	PEAK HR FACTOR		0.866			0.866			0.796			0.934		0.895
	APP/DEPART	807	/	716	499	/	651	1,035	/	1,115	1,700	/	1,559	0
PM	4:00 PM	18	98	47	24	107	14	19	305	31	33	225	28	949
	4:15 PM	17	106	75	19	115	20	19	298	33	54	224	21	1,001
	4:30 PM	15	116	54	27	114	16	27	333	31	40	209	30	1,012
	4:45 PM	21	118	74	22	111	28	21	376	15	40	183	27	1,036
	5:00 PM	19	142	74	17	137	21	18	353	17	40	191	22	1,051
	5:15 PM	18	123	67	25	101	22	28	363	24	48	213	15	1,047
	5:30 PM	19	130	70	25	131	21	16	348	29	41	237	18	1,085
	5:45 PM	17	100	66	13	130	33	22	319	35	54	238	24	1,051
	VOLUMES	144	933	527	172	946	175	170	2,695	215	350	1,720	185	8,232
	APPROACH %	9%	58%	33%	13%	73%	14%	6%	88%	7%	16%	76%	8%	
	APP/DEPART	1,604	/	1,287	1,293	/	1,512	3,080	/	3,394	2,255	/	2,039	0
	BEGIN PEAK HR		5:00 PM											
	VOLUMES	73	495	277	80	499	97	84	1,383	105	183	879	79	4,234
	APPROACH %	9%	59%	33%	12%	74%	14%	5%	88%	7%	16%	77%	7%	
	PEAK HR FACTOR		0.899			0.955			0.947			0.903		0.976
	APP/DEPART	845	/	658	676	/	788	1,572	/	1,740	1,141	/	1,048	0



INTERSECTION TURNING MOVEMENT COUNTS

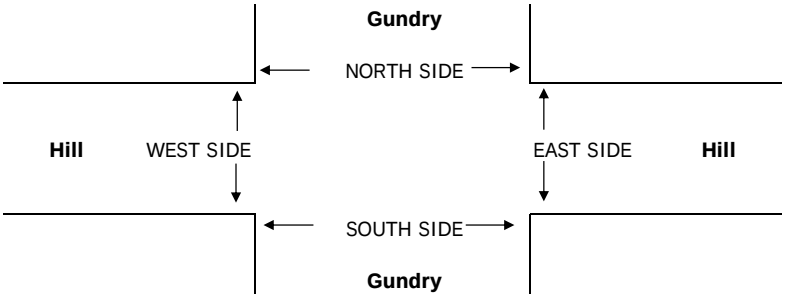
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1581
Thu, Jan 11, 18	NORTH & SOUTH:	Gundry	LOCATION #:	6
	EAST & WEST:	Hill	CONTROL:	STOP N

NOTES:

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

		NORTHBOUND Gundry			SOUTHBOUND Gundry			EASTBOUND Hill			WESTBOUND Hill			
	LANES:	NL 0	NT X	NR 0	SL X	ST X	SR X	EL X	ET 1	ER 0	WL 0	WT 1	WR X	TOTAL
AM	7:00 AM	8	0	1	0	0	0	0	13	2	0	14	0	38
	7:15 AM	7	0	3	0	0	0	0	20	1	0	26	0	57
	7:30 AM	1	0	2	0	0	0	0	35	0	1	64	0	103
	7:45 AM	4	0	1	0	0	0	1	40	4	3	89	0	142
	8:00 AM	4	0	0	0	0	0	0	25	0	1	49	0	79
	8:15 AM	2	0	3	0	0	0	1	18	0	1	21	0	46
	8:30 AM	1	0	2	0	0	0	0	45	1	3	30	0	82
	8:45 AM	2	0	2	0	0	0	1	57	0	1	43	0	106
	VOLUMES	29	0	14	0	0	0	3	253	8	10	336	0	653
	APPROACH %	67%	0%	33%	0%	0%	0%	1%	96%	3%	3%	97%	0%	
	APP/DEPART	43	/	0	0	/	15	264	/	270	346	/	368	0
	BEGIN PEAK HR		7:15 AM											
	VOLUMES	16	0	6	0	0	0	1	120	5	5	228	0	381
	APPROACH %	73%	0%	27%	0%	0%	0%	1%	95%	4%	2%	98%	0%	
	PEAK HR FACTOR		0.550			0.000			0.700			0.633		0.671
	APP/DEPART	22	/	0	0	/	8	126	/	128	233	/	245	0
PM	4:00 PM	0	0	4	0	0	0	0	43	2	3	32	0	84
	4:15 PM	1	0	2	0	0	0	0	39	1	2	33	0	78
	4:30 PM	3	0	1	0	0	0	0	39	1	1	31	0	76
	4:45 PM	2	0	4	0	0	0	0	23	0	2	26	0	57
	5:00 PM	3	0	2	0	0	0	0	35	0	3	41	0	84
	5:15 PM	0	0	1	0	0	0	0	47	0	0	53	0	101
	5:30 PM	1	0	1	0	0	0	0	37	1	0	42	0	82
	5:45 PM	0	0	2	0	0	0	0	27	3	1	43	0	76
	VOLUMES	10	0	17	0	0	0	0	290	8	12	301	0	638
	APPROACH %	37%	0%	63%	0%	0%	0%	0%	97%	3%	4%	96%	0%	
	APP/DEPART	27	/	0	0	/	18	298	/	309	313	/	311	0
	BEGIN PEAK HR		5:00 PM											
	VOLUMES	4	0	6	0	0	0	0	146	4	4	179	0	343
	APPROACH %	40%	0%	60%	0%	0%	0%	0%	97%	3%	2%	98%	0%	
	PEAK HR FACTOR		0.500			0.000			0.798			0.863		0.849
	APP/DEPART	10	/	0	0	/	6	150	/	154	183	/	183	0



INTERSECTION TURNING MOVEMENT COUNTS

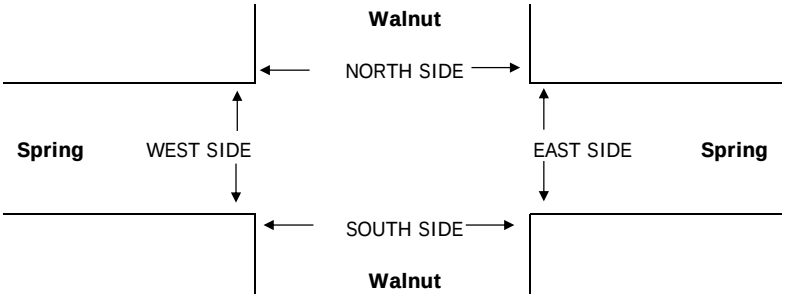
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1581
Thu, Jan 11, 18	NORTH & SOUTH:	Walnut	LOCATION #:	7
	EAST & WEST:	Spring	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Walnut			SOUTHBOUND Walnut			EASTBOUND Spring			WESTBOUND Spring			
	LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 0	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL
AM	7:00 AM	8	20	11	8	16	4	2	94	9	16	180	9	377
	7:15 AM	15	18	17	13	22	9	5	129	14	24	235	3	504
	7:30 AM	18	23	13	11	31	15	7	169	10	23	233	10	563
	7:45 AM	23	31	24	6	31	13	12	179	16	35	309	11	690
	8:00 AM	25	26	17	7	31	9	5	144	18	21	273	11	587
	8:15 AM	24	22	8	5	26	9	7	143	11	23	237	11	526
	8:30 AM	21	19	9	6	19	5	9	158	17	9	168	10	450
	8:45 AM	17	21	14	6	19	6	14	140	23	16	208	10	494
	VOLUMES	151	180	113	62	195	70	61	1,156	118	167	1,843	75	4,191
	APPROACH %	34%	41%	25%	19%	60%	21%	5%	87%	9%	8%	88%	4%	
	APP/DEPART	444	/	313	327	/	476	1,335	/	1,335	2,085	/	2,067	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	90	102	62	29	119	46	31	635	55	102	1,052	43	2,366
	APPROACH %	35%	40%	24%	15%	61%	24%	4%	88%	8%	9%	88%	4%	
	PEAK HR FACTOR		0.814			0.851			0.871			0.843		0.857
	APP/DEPART	254	/	174	194	/	274	721	/	728	1,197	/	1,190	0
PM	4:00 PM	24	57	29	9	25	7	17	262	13	18	194	21	676
	4:15 PM	24	46	33	5	32	3	20	242	14	11	181	25	636
	4:30 PM	25	47	38	11	26	5	18	281	19	15	154	13	652
	4:45 PM	20	43	36	13	27	4	16	264	25	11	165	12	636
	5:00 PM	37	65	30	11	32	8	15	247	30	18	203	19	715
	5:15 PM	24	59	33	7	24	12	24	254	17	21	216	22	713
	5:30 PM	24	56	29	14	33	7	22	238	22	12	162	7	626
	5:45 PM	29	44	24	9	14	4	32	225	19	5	153	17	575
	VOLUMES	207	417	252	79	213	50	164	2,013	159	111	1,428	136	5,229
	APPROACH %	24%	48%	29%	23%	62%	15%	7%	86%	7%	7%	85%	8%	
	APP/DEPART	876	/	716	342	/	480	2,336	/	2,347	1,675	/	1,686	0
	BEGIN PEAK HR		4:30 PM											
	VOLUMES	106	214	137	42	109	29	73	1,046	91	65	738	66	2,716
	APPROACH %	23%	47%	30%	23%	61%	16%	6%	86%	8%	7%	85%	8%	
	PEAK HR FACTOR		0.866			0.882			0.951			0.839		0.950
	APP/DEPART	457	/	353	180	/	263	1,210	/	1,227	869	/	873	0



INTERSECTION TURNING MOVEMENT COUNTS

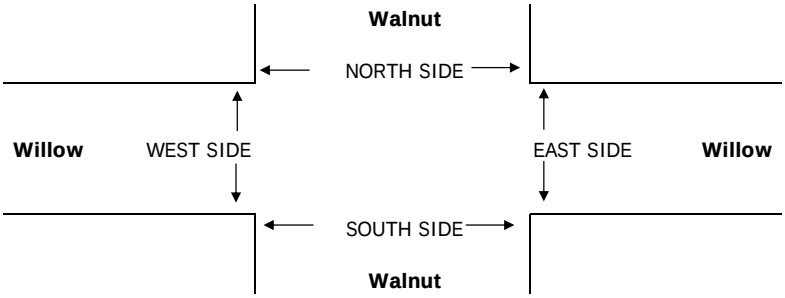
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1581
Thu, Jan 11, 18	NORTH & SOUTH:	Walnut	LOCATION #:	8
	EAST & WEST:	Willow	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Walnut			SOUTHBOUND Walnut			EASTBOUND Willow			WESTBOUND Willow			
	LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 1	ET 3	ER 0	WL 1	WT 3	WR 0	TOTAL
AM	7:00 AM	16	25	27	6	10	7	4	161	3	15	262	15	551
	7:15 AM	19	39	38	7	31	8	7	215	5	11	287	11	678
	7:30 AM	16	35	36	5	38	3	3	242	15	10	335	14	752
	7:45 AM	15	49	50	10	26	7	12	246	12	12	288	12	739
	8:00 AM	8	36	31	9	14	16	11	263	7	10	311	25	741
	8:15 AM	12	38	43	15	28	6	6	231	7	18	265	18	687
	8:30 AM	9	21	14	11	15	5	6	245	15	13	232	13	599
	8:45 AM	21	23	32	13	21	6	12	192	11	12	264	15	622
	VOLUMES	116	266	271	76	183	58	61	1,795	75	101	2,244	123	5,369
	APPROACH %	18%	41%	42%	24%	58%	18%	3%	93%	4%	4%	91%	5%	
	APP/DEPART	653	/	448	317	/	357	1,931	/	2,144	2,468	/	2,420	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	51	158	160	39	106	32	32	982	41	50	1,199	69	2,919
	APPROACH %	14%	43%	43%	22%	60%	18%	3%	93%	4%	4%	91%	5%	
	PEAK HR FACTOR		0.809			0.903			0.939			0.918		0.970
	APP/DEPART	369	/	257	177	/	197	1,055	/	1,181	1,318	/	1,284	0
PM	4:00 PM	15	51	42	24	43	9	6	308	12	22	294	17	843
	4:15 PM	16	43	37	24	30	11	8	374	13	30	278	13	877
	4:30 PM	19	39	49	30	38	12	14	345	8	24	253	16	847
	4:45 PM	11	32	39	22	34	7	14	382	12	27	271	9	860
	5:00 PM	23	55	49	25	52	16	11	379	14	23	303	15	965
	5:15 PM	9	48	44	13	34	16	14	396	18	18	315	13	938
	5:30 PM	18	44	51	20	32	12	10	363	12	26	279	23	890
	5:45 PM	8	33	32	11	26	12	12	373	12	17	245	16	797
	VOLUMES	119	345	343	169	289	95	89	2,920	101	187	2,238	122	7,017
	APPROACH %	15%	43%	43%	31%	52%	17%	3%	94%	3%	7%	88%	5%	
	APP/DEPART	807	/	557	553	/	575	3,110	/	3,434	2,547	/	2,451	0
	BEGIN PEAK HR		4:45 PM											
	VOLUMES	61	179	183	80	152	51	49	1,520	56	94	1,168	60	3,653
	APPROACH %	14%	42%	43%	28%	54%	18%	3%	94%	3%	7%	88%	5%	
	PEAK HR FACTOR		0.833			0.761			0.949			0.955		0.946
	APP/DEPART	423	/	288	283	/	302	1,625	/	1,784	1,322	/	1,279	0



INTERSECTION TURNING MOVEMENT COUNTS

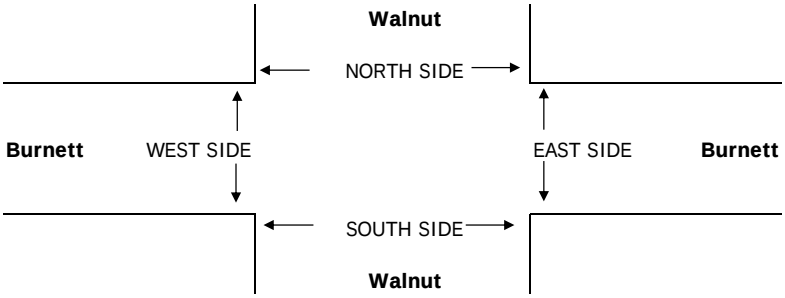
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:					
Thu, Jan 11, 18	LOCATION:	Signal Hill	PROJECT #:	SC1581
	NORTH & SOUTH:	Walnut	LOCATION #:	9
	EAST & WEST:	Burnett	CONTROL:	STOP ALL

NOTES:

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

		NORTHBOUND Walnut			SOUTHBOUND Walnut			EASTBOUND Burnett			WESTBOUND Burnett			
	LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
AM	7:00 AM	4	52	2	3	14	3	2	5	0	2	14	3	104
	7:15 AM	3	73	5	4	24	11	4	7	1	9	15	1	157
	7:30 AM	11	73	6	3	43	12	8	10	22	15	19	5	227
	7:45 AM	21	88	6	1	36	16	10	9	26	22	19	1	255
	8:00 AM	10	64	11	3	21	6	7	13	9	2	28	3	177
	8:15 AM	2	56	2	3	40	6	12	11	3	2	18	7	162
	8:30 AM	6	32	2	2	32	7	4	13	7	5	13	4	127
	8:45 AM	6	59	1	1	31	4	2	11	3	6	12	3	139
	VOLUMES	63	497	35	20	241	65	49	79	71	63	138	27	1,348
	APPROACH %	11%	84%	6%	6%	74%	20%	25%	40%	36%	28%	61%	12%	
	APP/DEPART	595	/	573	326	/	376	199	/	135	228	/	264	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	44	281	25	10	140	40	37	43	60	41	84	16	821
	APPROACH %	13%	80%	7%	5%	74%	21%	26%	31%	43%	29%	60%	11%	
	PEAK HR FACTOR		0.761			0.819			0.778			0.839		0.805
	APP/DEPART	350	/	334	190	/	242	140	/	78	141	/	167	0
PM	4:00 PM	2	75	7	2	59	6	21	16	3	10	18	1	220
	4:15 PM	3	72	4	2	60	8	9	20	3	8	17	5	211
	4:30 PM	1	91	8	5	60	5	15	25	8	4	14	2	238
	4:45 PM	5	56	3	9	50	9	5	19	2	5	15	1	179
	5:00 PM	4	81	6	6	73	2	16	14	3	2	19	5	231
	5:15 PM	5	70	4	2	70	6	17	18	2	10	16	5	225
	5:30 PM	5	77	0	5	51	11	20	11	5	3	16	0	204
	5:45 PM	7	63	4	2	47	8	9	20	3	9	13	1	186
	VOLUMES	32	585	36	33	470	55	112	143	29	51	128	20	1,694
	APPROACH %	5%	90%	6%	6%	84%	10%	39%	50%	10%	26%	64%	10%	
	APP/DEPART	653	/	717	558	/	551	284	/	212	199	/	214	0
	BEGIN PEAK HR		4:30 PM											
	VOLUMES	15	298	21	22	253	22	53	76	15	21	64	13	873
	APPROACH %	4%	89%	6%	7%	85%	7%	37%	53%	10%	21%	65%	13%	
	PEAK HR FACTOR		0.835			0.917			0.750			0.790		0.917
	APP/DEPART	334	/	364	297	/	289	144	/	119	98	/	101	0



INTERSECTION TURNING MOVEMENT COUNTS

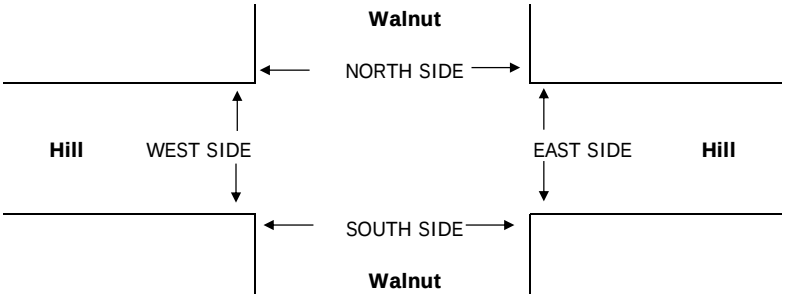
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1581
Thu, Jan 11, 18	NORTH & SOUTH:	Walnut	LOCATION #:	10
	EAST & WEST:	Hill	CONTROL:	STOP ALL

NOTES:

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

		NORTHBOUND Walnut			SOUTHBOUND Walnut			EASTBOUND Hill			WESTBOUND Hill			
	LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 1	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
AM	7:00 AM	2	38	0	1	12	7	4	8	2	3	6	4	87
	7:15 AM	3	53	1	4	19	11	3	19	0	5	16	6	140
	7:30 AM	4	49	2	16	42	46	7	20	7	5	17	11	226
	7:45 AM	10	53	4	18	38	61	6	21	11	6	21	16	265
	8:00 AM	5	52	1	10	32	19	5	17	8	7	16	2	174
	8:15 AM	4	39	4	2	30	6	3	14	6	6	12	5	131
	8:30 AM	7	28	3	5	27	8	4	25	19	10	21	4	161
	8:45 AM	15	42	2	2	39	5	6	34	18	9	25	13	210
	VOLUMES	50	354	17	58	239	163	38	158	71	51	134	61	1,394
	APPROACH %	12%	84%	4%	13%	52%	35%	14%	59%	27%	21%	54%	25%	
	APP/DEPART	421	/	451	460	/	361	267	/	233	246	/	349	0
	BEGIN PEAK HR		7:15 AM											
	VOLUMES	22	207	8	48	131	137	21	77	26	23	70	35	805
	APPROACH %	9%	87%	3%	15%	41%	43%	17%	62%	21%	18%	55%	27%	
	PEAK HR FACTOR		0.884			0.675			0.816			0.744		0.759
	APP/DEPART	237	/	263	316	/	180	124	/	133	128	/	229	0
PM	4:00 PM	4	58	6	3	57	16	7	30	4	4	20	6	215
	4:15 PM	5	47	3	10	59	10	10	25	7	0	18	3	197
	4:30 PM	2	73	10	5	46	12	6	23	9	3	19	5	213
	4:45 PM	6	37	5	5	50	10	3	22	4	5	14	5	166
	5:00 PM	6	62	6	10	54	17	11	22	4	4	25	11	232
	5:15 PM	6	56	4	13	51	15	13	29	6	6	26	10	235
	5:30 PM	7	46	7	7	60	8	4	30	6	10	24	6	215
	5:45 PM	4	37	5	4	52	17	6	19	5	1	21	6	177
	VOLUMES	40	416	46	57	429	105	60	200	45	33	167	52	1,650
	APPROACH %	8%	83%	9%	10%	73%	18%	20%	66%	15%	13%	66%	21%	
	APP/DEPART	502	/	528	591	/	504	305	/	306	252	/	312	0
	BEGIN PEAK HR		5:00 PM											
	VOLUMES	23	201	22	34	217	57	34	100	21	21	96	33	859
	APPROACH %	9%	82%	9%	11%	70%	19%	22%	65%	14%	14%	64%	22%	
	PEAK HR FACTOR		0.831			0.951			0.807			0.893		0.914
	APP/DEPART	246	/	268	308	/	256	155	/	159	150	/	176	0



INTERSECTION TURNING MOVEMENT COUNTS

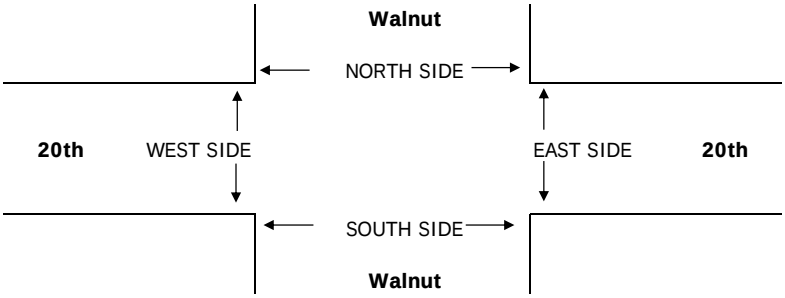
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1581
Wed, Jan 17, 18	NORTH & SOUTH:	Walnut	LOCATION #:	11
	EAST & WEST:	20th	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Walnut			SOUTHBOUND Walnut			EASTBOUND 20th			WESTBOUND 20th			
	LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 1	ET 1	ER 0	WL 1	WT 1	WR 0	TOTAL
AM	7:00 AM	6	35	3	1	14	3	8	5	0	6	8	4	93
	7:15 AM	7	41	3	2	23	6	6	16	12	6	10	8	140
	7:30 AM	22	32	14	8	35	15	22	37	31	11	29	3	259
	7:45 AM	15	55	19	11	31	18	31	28	29	17	35	6	295
	8:00 AM	5	39	8	13	36	5	5	26	10	13	31	8	199
	8:15 AM	5	29	9	10	17	7	10	25	3	4	8	5	132
	8:30 AM	3	37	21	22	22	4	5	53	12	8	37	6	230
	8:45 AM	2	37	24	21	22	6	5	54	9	11	37	20	248
	VOLUMES	65	305	101	88	200	64	92	244	106	76	195	60	1,596
	APPROACH %	14%	65%	21%	25%	57%	18%	21%	55%	24%	23%	59%	18%	
	APP/DEPART	471	/	457	352	/	382	442	/	433	331	/	324	0
	BEGIN PEAK HR		7:15 AM											
	VOLUMES	49	167	44	34	125	44	64	107	82	47	105	25	893
	APPROACH %	19%	64%	17%	17%	62%	22%	25%	42%	32%	27%	59%	14%	
	PEAK HR FACTOR		0.730			0.846			0.703			0.763		0.757
	APP/DEPART	260	/	256	203	/	254	253	/	185	177	/	198	0
PM	4:00 PM	9	44	13	4	56	8	10	13	10	5	14	9	195
	4:15 PM	7	50	14	5	44	6	8	13	12	3	16	6	184
	4:30 PM	9	42	14	9	54	7	9	14	13	11	10	5	197
	4:45 PM	5	49	18	6	43	6	11	29	7	10	12	4	200
	5:00 PM	7	53	8	7	56	6	17	17	4	10	7	4	196
	5:15 PM	9	48	9	6	47	8	10	20	10	6	6	4	183
	5:30 PM	5	49	9	9	47	11	9	17	8	13	12	9	198
	5:45 PM	5	39	7	5	45	9	4	5	2	8	16	5	150
	VOLUMES	56	374	92	51	392	61	78	128	66	66	93	46	1,503
	APPROACH %	11%	72%	18%	10%	78%	12%	29%	47%	24%	32%	45%	22%	
	APP/DEPART	522	/	498	504	/	524	272	/	271	205	/	210	0
	BEGIN PEAK HR		4:45 PM											
	VOLUMES	26	199	44	28	193	31	47	83	29	39	37	21	777
	APPROACH %	10%	74%	16%	11%	77%	12%	30%	52%	18%	40%	38%	22%	
	PEAK HR FACTOR		0.934			0.900			0.846			0.713		0.971
	APP/DEPART	269	/	267	252	/	261	159	/	155	97	/	94	0



INTERSECTION TURNING MOVEMENT COUNTS

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

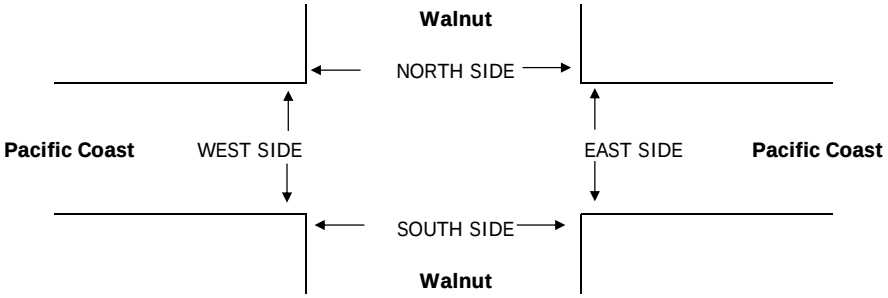
DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1581
Thu, Jan 11, 18	NORTH & SOUTH:	Walnut	LOCATION #:	12
	EAST & WEST:	Pacific Coast	CONTROL:	SIGNAL

NOTES:

AM ER construction

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

		NORTHBOUND Walnut			SOUTHBOUND Walnut			EASTBOUND Pacific Coast			WESTBOUND Pacific Coast			
	LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 1	ET 3	ER 0	WL 1	WT 3	WR 0	TOTAL
AM	7:00 AM	7	18	3	5	7	14	3	170	4	4	320	9	564
	7:15 AM	4	30	15	5	6	17	19	222	9	12	394	17	750
	7:30 AM	16	26	4	14	14	36	19	278	17	6	444	25	899
	7:45 AM	12	21	10	14	10	30	27	285	42	8	411	30	900
	8:00 AM	19	24	14	5	15	23	24	247	15	8	369	18	781
	8:15 AM	16	23	9	7	16	13	10	241	6	3	337	13	694
	8:30 AM	13	10	11	6	17	12	16	226	8	11	315	13	658
	8:45 AM	6	27	4	4	16	10	18	238	0	7	364	16	710
	VOLUMES	93	179	70	60	101	155	136	1,907	101	59	2,954	141	5,956
	APPROACH %	27%	52%	20%	19%	32%	49%	6%	89%	5%	2%	94%	4%	
	APP/DEPART	342	/	456	316	/	260	2,144	/	2,038	3,154	/	3,202	0
	BEGIN PEAK HR		7:15 AM											
	VOLUMES	51	101	43	38	45	106	89	1,032	83	34	1,618	90	3,330
	APPROACH %	26%	52%	22%	20%	24%	56%	7%	86%	7%	2%	93%	5%	
	PEAK HR FACTOR		0.855			0.738			0.850			0.917		0.925
	APP/DEPART	195	/	280	189	/	161	1,204	/	1,114	1,742	/	1,775	0
PM	4:00 PM	5	28	13	14	28	26	23	356	10	14	275	13	805
	4:15 PM	8	37	8	8	38	18	18	377	8	7	273	16	816
	4:30 PM	12	32	14	7	32	24	34	384	11	10	273	15	848
	4:45 PM	3	14	7	13	29	18	29	405	16	16	234	14	798
	5:00 PM	11	38	9	12	41	20	23	432	12	13	243	10	864
	5:15 PM	3	30	7	17	33	24	28	438	16	14	269	19	898
	5:30 PM	8	24	6	9	31	22	27	407	10	15	284	18	861
	5:45 PM	4	13	8	12	28	23	19	353	15	18	263	16	772
	VOLUMES	54	216	72	92	260	175	201	3,152	98	107	2,114	121	6,662
	APPROACH %	16%	63%	21%	17%	49%	33%	6%	91%	3%	5%	90%	5%	
	APP/DEPART	342	/	537	527	/	464	3,451	/	3,317	2,342	/	2,344	0
	BEGIN PEAK HR		4:45 PM											
	VOLUMES	25	106	29	51	134	84	107	1,682	54	58	1,030	61	3,421
	APPROACH %	16%	66%	18%	19%	50%	31%	6%	91%	3%	5%	90%	5%	
	PEAK HR FACTOR		0.690			0.909			0.956			0.906		0.952
	APP/DEPART	160	/	273	269	/	245	1,843	/	1,763	1,149	/	1,140	0



INTERSECTION TURNING MOVEMENT COUNTS

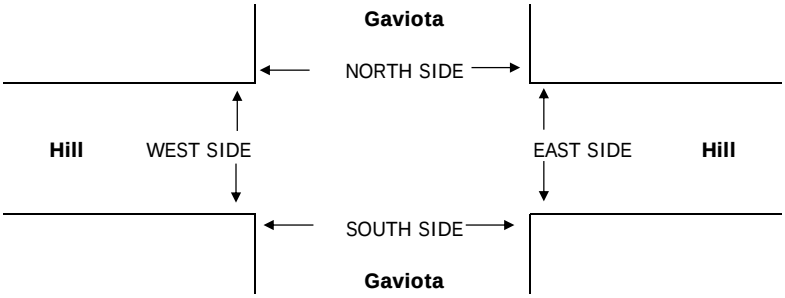
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1581
Thu, Jan 11, 18	NORTH & SOUTH:	Gaviota	LOCATION #:	13
	EAST & WEST:	Hill	CONTROL:	STOP N/S

NOTES:

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

		NORTHBOUND Gaviota			SOUTHBOUND Gaviota			EASTBOUND Hill			WESTBOUND Hill			
	LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
AM	7:00 AM	1	0	3	3	0	6	1	8	4	0	8	2	36
	7:15 AM	5	1	4	5	0	1	1	20	1	0	20	0	58
	7:30 AM	2	1	2	3	0	8	0	33	4	5	21	3	82
	7:45 AM	7	1	6	4	1	1	0	34	5	5	32	1	97
	8:00 AM	2	1	4	6	0	2	2	28	2	5	24	1	77
	8:15 AM	1	1	0	6	0	6	1	15	0	0	16	5	51
	8:30 AM	5	2	6	2	2	3	1	23	11	4	24	5	88
	8:45 AM	12	1	1	3	1	3	0	31	5	0	31	5	93
	VOLUMES	35	8	26	32	4	30	6	192	32	19	176	22	582
	APPROACH %	51%	12%	38%	48%	6%	45%	3%	83%	14%	9%	81%	10%	
	APP/DEPART	69	/	34	66	/	55	230	/	250	217	/	243	0
	BEGIN PEAK HR		7:15 AM											
	VOLUMES	16	4	16	18	1	12	3	115	12	15	97	5	314
	APPROACH %	44%	11%	44%	58%	3%	39%	2%	88%	9%	13%	83%	4%	
	PEAK HR FACTOR		0.643			0.705			0.833			0.770		0.809
	APP/DEPART	36	/	11	31	/	28	130	/	149	117	/	126	0
PM	4:00 PM	0	0	4	0	0	0	1	38	1	2	33	3	82
	4:15 PM	1	1	5	3	0	0	0	30	3	1	25	8	77
	4:30 PM	0	0	2	2	0	3	2	35	3	2	22	5	76
	4:45 PM	1	0	5	4	1	1	3	30	1	3	22	5	76
	5:00 PM	1	0	0	1	0	5	3	27	0	2	25	3	67
	5:15 PM	1	1	5	5	0	2	6	39	2	4	36	4	105
	5:30 PM	2	0	8	3	1	4	4	40	2	3	35	9	111
	5:45 PM	3	0	4	3	0	3	3	30	1	3	29	2	81
	VOLUMES	9	2	33	21	2	18	22	269	13	20	227	39	675
	APPROACH %	20%	5%	75%	51%	5%	44%	7%	88%	4%	7%	79%	14%	
	APP/DEPART	44	/	62	41	/	31	304	/	326	286	/	256	0
	BEGIN PEAK HR		5:00 PM											
	VOLUMES	7	1	17	12	1	14	16	136	5	12	125	18	364
	APPROACH %	28%	4%	68%	44%	4%	52%	10%	87%	3%	8%	81%	12%	
	PEAK HR FACTOR		0.625			0.844			0.835			0.824		0.820
	APP/DEPART	25	/	35	27	/	15	157	/	167	155	/	147	0



INTERSECTION TURNING MOVEMENT COUNTS

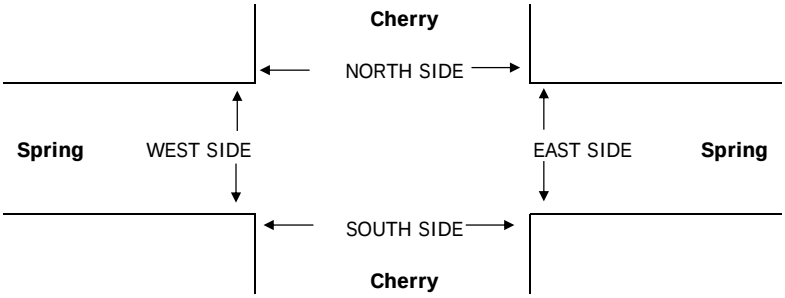
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1581
Thu, Jan 11, 18	NORTH & SOUTH:	Cherry	LOCATION #:	14
	EAST & WEST:	Spring	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Cherry			SOUTHBOUND Cherry			EASTBOUND Spring			WESTBOUND Spring			
	LANES:	NL 1	NT 3	NR 0	SL 2	ST 3	SR 0	EL 1	ET 3	ER 0	WL 1	WT 2.5	WR 1.5	TOTAL
AM	7:00 AM	9	191	21	35	190	28	21	79	15	18	167	84	858
	7:15 AM	6	261	27	57	308	44	15	121	15	20	235	71	1,180
	7:30 AM	25	267	38	63	282	40	32	153	10	24	262	78	1,274
	7:45 AM	20	259	47	89	309	36	37	145	22	24	295	83	1,366
	8:00 AM	26	286	43	64	235	31	25	135	22	40	259	99	1,265
	8:15 AM	15	257	42	65	272	30	26	111	21	17	236	98	1,190
	8:30 AM	18	226	34	51	232	40	27	137	21	25	191	92	1,094
	8:45 AM	15	259	32	71	281	39	19	117	12	26	188	86	1,145
	VOLUMES	134	2,006	284	495	2,109	288	202	998	138	194	1,833	691	9,372
	APPROACH %	6%	83%	12%	17%	73%	10%	15%	75%	10%	7%	67%	25%	
	APP/DEPART	2,424	/	2,929	2,892	/	2,440	1,338	/	1,747	2,718	/	2,256	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	86	1,069	170	281	1,098	137	120	544	75	105	1,052	358	5,095
	APPROACH %	6%	81%	13%	19%	72%	9%	16%	74%	10%	7%	69%	24%	
	PEAK HR FACTOR		0.933			0.873			0.906			0.942		0.932
	APP/DEPART	1,325	/	1,561	1,516	/	1,277	739	/	982	1,515	/	1,275	0
PM	4:00 PM	22	295	46	56	247	26	42	208	31	30	227	92	1,322
	4:15 PM	36	284	38	61	343	29	32	242	31	21	139	97	1,353
	4:30 PM	21	309	28	47	285	29	53	248	33	20	147	81	1,301
	4:45 PM	19	282	32	64	375	25	28	218	33	22	143	98	1,339
	5:00 PM	25	305	27	48	281	21	41	234	33	29	153	107	1,304
	5:15 PM	19	291	45	65	335	42	34	218	34	23	170	90	1,366
	5:30 PM	18	284	38	53	277	26	38	241	26	30	134	90	1,255
	5:45 PM	20	325	24	65	312	33	27	200	28	18	135	70	1,257
	VOLUMES	180	2,375	278	459	2,455	231	295	1,809	249	193	1,248	725	10,497
	APPROACH %	6%	84%	10%	15%	78%	7%	13%	77%	11%	9%	58%	33%	
	APP/DEPART	2,833	/	3,413	3,145	/	2,896	2,353	/	2,530	2,166	/	1,658	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	98	1,170	144	228	1,250	109	155	916	128	93	656	368	5,315
	APPROACH %	7%	83%	10%	14%	79%	7%	13%	76%	11%	8%	59%	33%	
	PEAK HR FACTOR		0.972			0.855			0.897			0.800		0.982
	APP/DEPART	1,412	/	1,705	1,587	/	1,470	1,199	/	1,278	1,117	/	862	0



INTERSECTION TURNING MOVEMENT COUNTS

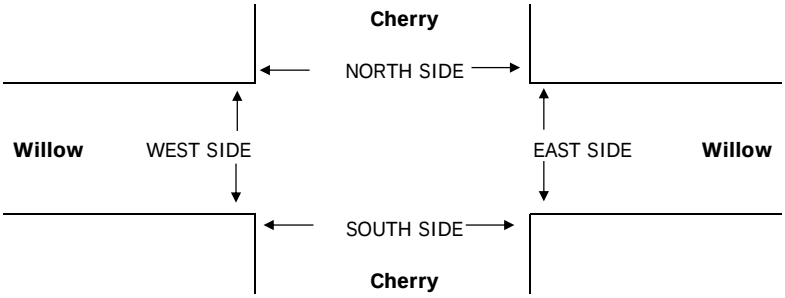
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1581
Thu, Jan 11, 18	NORTH & SOUTH:	Cherry	LOCATION #:	15
	EAST & WEST:	Willow	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Cherry			SOUTHBOUND Cherry			EASTBOUND Willow			WESTBOUND Willow			
	LANES:	NL 1	NT 3	NR 1	SL 2	ST 3	SR 0	EL 2	ET 3	ER 0	WL 2	WT 3	WR 0	TOTAL
AM	7:00 AM	31	138	32	38	131	30	21	176	10	37	229	21	894
	7:15 AM	45	240	44	34	173	34	45	177	14	59	287	25	1,177
	7:30 AM	31	249	35	37	209	35	37	220	25	55	302	27	1,262
	7:45 AM	46	291	41	37	192	39	46	214	22	62	242	30	1,262
	8:00 AM	45	251	41	41	191	39	49	225	24	55	293	34	1,288
	8:15 AM	38	231	46	40	181	36	65	204	22	62	209	23	1,157
	8:30 AM	42	188	38	40	198	32	30	215	15	61	221	32	1,112
	8:45 AM	44	195	43	54	176	47	36	189	25	52	220	29	1,110
	VOLUMES	322	1,783	320	321	1,451	292	329	1,620	157	443	2,003	221	9,262
	APPROACH %	13%	74%	13%	16%	70%	14%	16%	77%	7%	17%	75%	8%	
	APP/DEPART	2,425	/	2,333	2,064	/	2,106	2,106	/	2,261	2,667	/	2,562	0
	BEGIN PEAK HR		7:15 AM											
	VOLUMES	167	1,031	161	149	765	147	177	836	85	231	1,124	116	4,989
	APPROACH %	12%	76%	12%	14%	72%	14%	16%	76%	8%	16%	76%	8%	
	PEAK HR FACTOR		0.899			0.944			0.921			0.958		0.968
	APP/DEPART	1,359	/	1,324	1,061	/	1,104	1,098	/	1,145	1,471	/	1,416	0
PM	4:00 PM	42	209	53	58	231	46	50	330	30	72	247	49	1,417
	4:15 PM	47	219	46	83	250	42	57	318	26	61	217	51	1,417
	4:30 PM	34	223	46	78	177	41	59	319	27	83	250	58	1,395
	4:45 PM	42	209	44	78	238	49	51	321	36	65	210	39	1,382
	5:00 PM	50	233	64	78	228	41	55	344	38	82	308	39	1,560
	5:15 PM	26	204	56	67	267	54	47	330	30	77	236	54	1,448
	5:30 PM	48	198	56	75	229	40	53	324	31	80	237	37	1,408
	5:45 PM	42	200	43	83	256	48	56	294	33	79	209	45	1,388
	VOLUMES	331	1,695	408	600	1,876	361	428	2,580	251	599	1,914	372	11,415
	APPROACH %	14%	70%	17%	21%	66%	13%	13%	79%	8%	21%	66%	13%	
	APP/DEPART	2,434	/	2,494	2,837	/	2,771	3,259	/	3,591	2,885	/	2,559	0
	BEGIN PEAK HR		5:00 PM											
	VOLUMES	166	835	219	303	980	183	211	1,292	132	318	990	175	5,804
	APPROACH %	14%	68%	18%	21%	67%	12%	13%	79%	8%	21%	67%	12%	
	PEAK HR FACTOR		0.879			0.945			0.935			0.864		0.930
	APP/DEPART	1,220	/	1,220	1,466	/	1,453	1,635	/	1,815	1,483	/	1,316	0



INTERSECTION TURNING MOVEMENT COUNTS

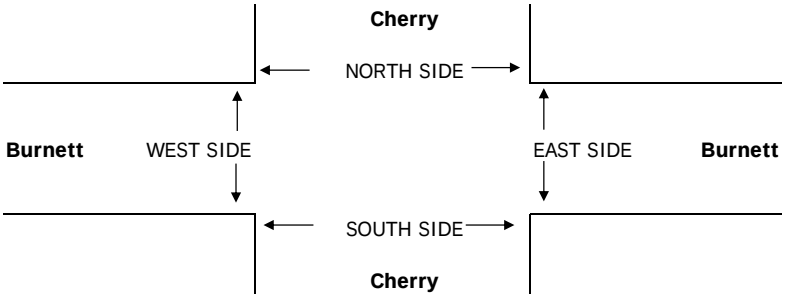
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1581
Thu, Jan 11, 18	NORTH & SOUTH:	Cherry	LOCATION #:	16
	EAST & WEST:	Burnett	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Cherry			SOUTHBOUND Cherry			EASTBOUND Burnett			WESTBOUND Burnett			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 0.3	ET 0.3	ER 0.3	WL 0.5	WT 0.5	WR 1	TOTAL
AM	7:00 AM	5	217	0	5	122	12	4	5	2	4	4	21	401
	7:15 AM	5	277	0	12	194	17	5	2	2	3	6	22	545
	7:30 AM	10	326	4	10	249	16	3	7	1	4	11	25	666
	7:45 AM	7	351	4	16	222	24	5	3	2	2	7	30	673
	8:00 AM	10	351	7	15	221	14	10	7	5	2	10	29	681
	8:15 AM	7	273	2	11	227	11	3	9	3	4	8	31	589
	8:30 AM	7	284	2	15	219	10	7	4	4	2	7	20	581
	8:45 AM	8	255	5	16	238	13	4	2	3	3	3	22	572
	VOLUMES	59	2,334	24	100	1,692	117	41	39	22	24	56	200	4,708
	APPROACH %	2%	97%	1%	5%	89%	6%	40%	38%	22%	9%	20%	71%	
	APP/DEPART	2,417	/	2,576	1,909	/	1,739	102	/	162	280	/	231	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	34	1,301	17	52	919	65	21	26	11	12	36	115	2,609
	APPROACH %	3%	96%	1%	5%	89%	6%	36%	45%	19%	7%	22%	71%	
	PEAK HR FACTOR		0.918			0.942			0.659			0.948		0.958
	APP/DEPART	1,352	/	1,438	1,036	/	942	58	/	94	163	/	135	0
PM	4:00 PM	3	225	9	31	277	9	16	6	2	5	8	28	619
	4:15 PM	7	255	3	36	320	14	9	13	4	3	9	27	700
	4:30 PM	3	262	12	35	291	8	22	13	4	6	7	34	697
	4:45 PM	0	253	8	31	316	13	10	5	8	1	7	17	669
	5:00 PM	3	270	7	31	348	12	10	11	3	12	4	35	746
	5:15 PM	2	262	6	39	321	21	11	5	10	4	6	25	712
	5:30 PM	2	279	10	31	336	11	7	5	4	9	1	30	725
	5:45 PM	2	211	6	40	328	19	11	9	4	2	6	27	665
	VOLUMES	22	2,017	61	274	2,537	107	96	67	39	42	48	223	5,533
	APPROACH %	1%	96%	3%	9%	87%	4%	48%	33%	19%	13%	15%	71%	
	APP/DEPART	2,100	/	2,338	2,918	/	2,620	202	/	400	313	/	175	0
	BEGIN PEAK HR		4:45 PM											
	VOLUMES	7	1,064	31	132	1,321	57	38	26	25	26	18	107	2,852
	APPROACH %	1%	97%	3%	9%	87%	4%	43%	29%	28%	17%	12%	71%	
	PEAK HR FACTOR		0.947			0.965			0.856			0.740		0.956
	APP/DEPART	1,102	/	1,210	1,510	/	1,373	89	/	188	151	/	81	0



INTERSECTION TURNING MOVEMENT COUNTS

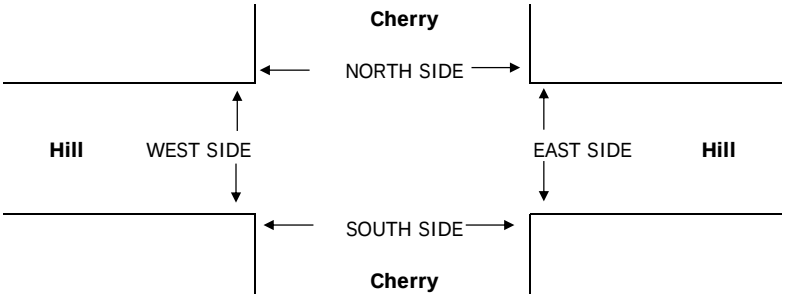
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1581
Thu, Jan 11, 18	NORTH & SOUTH:	Cherry	LOCATION #:	17
	EAST & WEST:	Hill	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Cherry			SOUTHBOUND Cherry			EASTBOUND Hill			WESTBOUND Hill			
	LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
AM	7:00 AM	2	210	0	2	132	13	16	0	6	0	0	2	383
	7:15 AM	9	258	1	0	165	15	25	0	12	3	0	8	496
	7:30 AM	10	302	1	2	254	15	23	0	18	1	2	6	634
	7:45 AM	15	329	1	3	181	28	41	0	15	3	1	8	625
	8:00 AM	9	310	1	4	218	27	25	1	14	1	0	6	616
	8:15 AM	7	259	1	2	191	18	23	0	8	1	0	3	513
	8:30 AM	9	277	3	2	207	27	15	0	19	1	1	5	566
	8:45 AM	21	245	0	5	208	20	23	0	21	0	0	10	553
	VOLUMES	82	2,190	8	20	1,556	163	191	1	113	10	4	48	4,386
	APPROACH %	4%	96%	0%	1%	89%	9%	63%	0%	37%	16%	6%	77%	
	APP/DEPART	2,280	/	2,431	1,739	/	1,686	305	/	27	62	/	242	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	41	1,200	4	11	844	88	112	1	55	6	3	23	2,388
	APPROACH %	3%	96%	0%	1%	90%	9%	67%	1%	33%	19%	9%	72%	
	PEAK HR FACTOR		0.902			0.870			0.750			0.667		0.942
	APP/DEPART	1,245	/	1,336	943	/	909	168	/	15	32	/	128	0
PM	4:00 PM	12	215	2	5	258	24	19	2	21	0	0	3	561
	4:15 PM	18	248	4	6	291	28	22	0	18	1	2	2	640
	4:30 PM	10	240	3	4	285	24	27	0	14	1	0	4	612
	4:45 PM	13	230	3	5	287	24	26	1	15	0	0	2	606
	5:00 PM	9	262	2	6	316	46	32	0	13	2	0	2	690
	5:15 PM	14	226	2	6	283	35	27	0	17	3	0	4	617
	5:30 PM	13	257	2	4	328	30	27	1	21	0	2	2	687
	5:45 PM	18	202	3	10	289	31	23	1	11	3	1	3	595
	VOLUMES	107	1,880	21	46	2,337	242	203	5	130	10	5	22	5,008
	APPROACH %	5%	94%	1%	2%	89%	9%	60%	1%	38%	27%	14%	59%	
	APP/DEPART	2,008	/	2,111	2,625	/	2,484	338	/	66	37	/	347	0
	BEGIN PEAK HR		4:45 PM											
	VOLUMES	49	975	9	21	1,214	135	112	2	66	5	2	10	2,600
	APPROACH %	5%	94%	1%	2%	89%	10%	62%	1%	37%	29%	12%	59%	
	PEAK HR FACTOR		0.946			0.931			0.918			0.607		0.942
	APP/DEPART	1,033	/	1,100	1,370	/	1,286	180	/	29	17	/	185	0



INTERSECTION TURNING MOVEMENT COUNTS

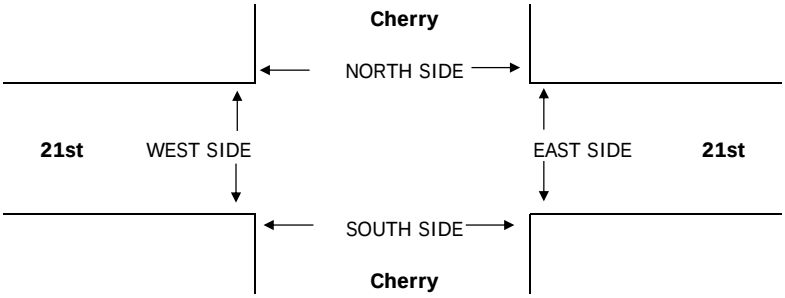
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1581
Thu, Jan 11, 18	NORTH & SOUTH:	Cherry	LOCATION #:	18
	EAST & WEST:	21st	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Cherry			SOUTHBOUND Cherry			EASTBOUND 21st			WESTBOUND 21st			
	LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 0	ET 1	ER 0	WL 1	WT 1	WR 0	TOTAL
AM	7:00 AM	1	170	3	3	114	7	4	0	2	3	1	35	343
	7:15 AM	7	227	3	7	169	19	6	2	5	3	6	37	491
	7:30 AM	17	264	2	11	203	37	23	6	18	5	24	41	651
	7:45 AM	15	255	3	20	181	27	31	9	27	2	36	50	656
	8:00 AM	11	281	3	15	197	10	22	29	13	2	15	28	626
	8:15 AM	6	235	2	16	182	14	3	3	4	2	2	31	500
	8:30 AM	6	235	5	12	187	13	11	5	9	5	5	36	529
	8:45 AM	11	217	25	16	225	8	7	2	8	7	5	26	557
	VOLUMES	74	1,884	46	100	1,458	135	107	56	86	29	94	284	4,353
	APPROACH %	4%	94%	2%	6%	86%	8%	43%	22%	35%	7%	23%	70%	
	APP/DEPART	2,004	/	2,277	1,693	/	1,574	249	/	200	407	/	302	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	49	1,035	10	62	763	88	79	47	62	11	77	150	2,433
	APPROACH %	4%	95%	1%	7%	84%	10%	42%	25%	33%	5%	32%	63%	
	PEAK HR FACTOR		0.927			0.909			0.701			0.676		0.927
	APP/DEPART	1,094	/	1,266	913	/	836	188	/	117	238	/	214	0
PM	4:00 PM	8	189	1	34	241	7	16	7	1	2	4	21	531
	4:15 PM	2	213	6	36	269	11	20	11	6	0	2	35	611
	4:30 PM	2	221	6	46	242	8	11	5	2	4	1	20	568
	4:45 PM	1	198	4	30	270	7	16	5	1	0	2	35	569
	5:00 PM	3	226	5	47	264	16	14	6	3	3	2	32	621
	5:15 PM	5	222	1	43	257	11	10	8	3	3	5	22	590
	5:30 PM	4	216	1	47	280	10	15	16	6	1	7	31	634
	5:45 PM	3	186	3	39	269	8	5	5	8	2	4	30	562
	VOLUMES	28	1,671	27	322	2,092	78	107	63	30	15	27	226	4,686
	APPROACH %	2%	97%	2%	13%	84%	3%	54%	32%	15%	6%	10%	84%	
	APP/DEPART	1,726	/	2,024	2,492	/	2,138	200	/	392	268	/	132	0
	BEGIN PEAK HR		4:45 PM											
	VOLUMES	13	862	11	167	1,071	44	55	35	13	7	16	120	2,414
	APPROACH %	1%	97%	1%	13%	84%	3%	53%	34%	13%	5%	11%	84%	
	PEAK HR FACTOR		0.947			0.951			0.696			0.917		0.952
	APP/DEPART	886	/	1,051	1,282	/	1,091	103	/	199	143	/	73	0



INTERSECTION TURNING MOVEMENT COUNTS

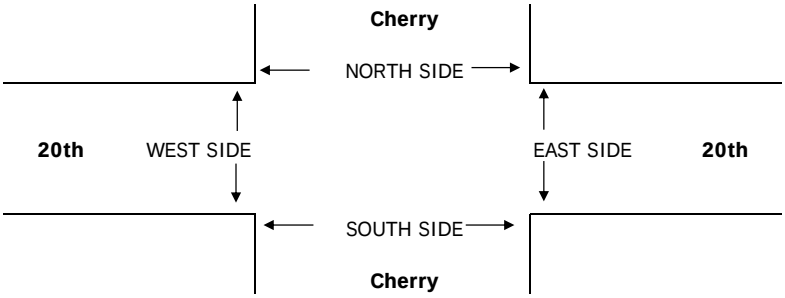
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1581
Thu, Jan 11, 18	NORTH & SOUTH:	Cherry	LOCATION #:	19
	EAST & WEST:	20th	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Cherry			SOUTHBOUND Cherry			EASTBOUND 20th			WESTBOUND 20th			
	LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 1	ET 0	ER 1	WL 0	WT 1	WR 0	TOTAL
AM	7:00 AM	1	179	2	1	124	0	0	0	4	3	1	6	321
	7:15 AM	3	210	0	1	121	4	0	0	1	3	0	8	351
	7:30 AM	5	253	2	2	202	15	3	0	7	5	2	10	506
	7:45 AM	3	275	0	3	197	9	6	1	10	4	8	8	524
	8:00 AM	5	247	2	1	204	11	12	7	23	5	12	24	553
	8:15 AM	1	231	2	0	204	5	12	0	13	5	1	8	482
	8:30 AM	6	207	5	3	201	7	22	0	28	7	2	16	504
	8:45 AM	6	205	5	3	235	11	29	2	45	9	0	14	564
	VOLUMES	30	1,807	18	14	1,488	62	84	10	131	41	26	94	3,805
	APPROACH %	2%	97%	1%	1%	95%	4%	37%	4%	58%	25%	16%	58%	
	APP/DEPART	1,855	/	1,986	1,564	/	1,664	225	/	41	161	/	114	0
	BEGIN PEAK HR		8:00 AM											
	VOLUMES	18	890	14	7	844	34	75	9	109	26	15	62	2,103
	APPROACH %	2%	97%	2%	1%	95%	4%	39%	5%	56%	25%	15%	60%	
	PEAK HR FACTOR		0.907			0.889			0.635			0.628		0.932
	APP/DEPART	922	/	1,027	885	/	981	193	/	30	103	/	65	0
PM	4:00 PM	2	200	1	2	256	3	6	0	8	1	0	4	483
	4:15 PM	1	204	0	4	267	3	5	0	7	3	0	7	501
	4:30 PM	1	219	4	6	230	4	5	0	2	3	1	13	488
	4:45 PM	0	175	2	4	257	5	7	2	9	1	0	9	471
	5:00 PM	2	204	2	6	243	4	6	2	9	6	1	9	494
	5:15 PM	0	207	4	4	288	3	4	1	4	2	0	13	530
	5:30 PM	0	225	3	3	256	6	7	1	3	4	2	8	518
	5:45 PM	0	186	2	3	267	3	4	2	8	3	3	8	489
	VOLUMES	6	1,620	18	32	2,064	31	44	8	50	23	7	71	3,974
	APPROACH %	0%	99%	1%	2%	97%	1%	43%	8%	49%	23%	7%	70%	
	APP/DEPART	1,644	/	1,735	2,127	/	2,139	102	/	58	101	/	42	0
	BEGIN PEAK HR		5:00 PM											
	VOLUMES	2	822	11	16	1,054	16	21	6	24	15	6	38	2,031
	APPROACH %	0%	98%	1%	1%	97%	1%	41%	12%	47%	25%	10%	64%	
	PEAK HR FACTOR		0.916			0.920			0.750			0.922		0.958
	APP/DEPART	835	/	881	1,086	/	1,094	51	/	33	59	/	23	0



INTERSECTION TURNING MOVEMENT COUNTS

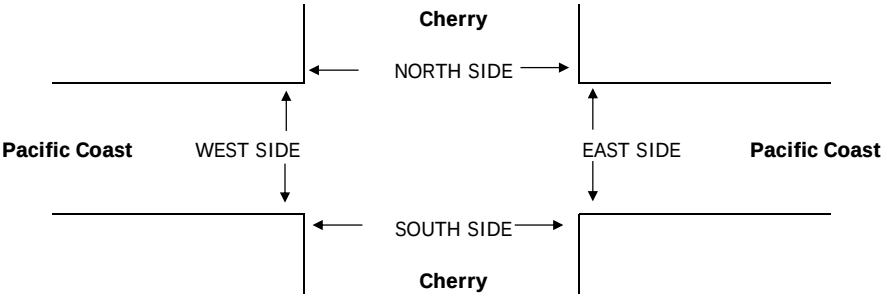
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1581
Thu, Jan 11, 18	NORTH & SOUTH:	Cherry	LOCATION #:	20
	EAST & WEST:	Pacific Coast	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Cherry			SOUTHBOUND Cherry			EASTBOUND Pacific Coast			WESTBOUND Pacific Coast			
	LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 1	ET 3	ER 0	WL 1	WT 3	WR 0	TOTAL
AM	7:00 AM	15	87	3	19	62	39	31	156	8	4	262	35	721
	7:15 AM	26	126	5	21	65	49	33	192	11	4	356	39	927
	7:30 AM	29	154	5	33	103	80	49	217	13	7	325	51	1,066
	7:45 AM	20	143	2	29	103	60	56	256	14	10	376	47	1,116
	8:00 AM	11	128	7	40	117	55	42	220	22	10	340	59	1,051
	8:15 AM	18	140	8	27	109	61	43	226	16	7	268	47	970
	8:30 AM	21	110	5	34	97	59	44	228	21	12	270	58	959
	8:45 AM	19	114	6	35	126	71	22	195	14	4	295	50	951
	VOLUMES	159	1,002	41	238	782	474	320	1,690	119	58	2,492	386	7,761
	APPROACH %	13%	83%	3%	16%	52%	32%	15%	79%	6%	2%	85%	13%	
	APP/DEPART	1,202	/	1,708	1,494	/	959	2,129	/	1,969	2,936	/	3,125	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	78	565	22	129	432	256	190	919	65	34	1,309	204	4,203
	APPROACH %	12%	85%	3%	16%	53%	31%	16%	78%	6%	2%	85%	13%	
	PEAK HR FACTOR		0.884			0.946			0.900			0.893		0.942
	APP/DEPART	665	/	959	817	/	531	1,174	/	1,070	1,547	/	1,643	0
PM	4:00 PM	19	104	13	29	111	51	35	249	11	17	175	33	847
	4:15 PM	18	100	8	56	132	71	42	352	18	16	235	47	1,095
	4:30 PM	20	108	10	37	118	52	48	313	18	20	214	49	1,007
	4:45 PM	17	100	9	52	131	65	39	376	28	23	214	38	1,092
	5:00 PM	23	109	7	56	146	65	48	348	21	12	178	43	1,056
	5:15 PM	21	116	5	50	146	59	56	367	13	19	230	36	1,118
	5:30 PM	17	106	15	35	147	52	48	344	23	24	233	46	1,090
	5:45 PM	17	88	14	44	149	59	43	354	21	17	250	45	1,101
	VOLUMES	152	831	81	359	1,080	474	359	2,703	153	148	1,729	337	8,406
	APPROACH %	14%	78%	8%	19%	56%	25%	11%	84%	5%	7%	78%	15%	
	APP/DEPART	1,064	/	1,527	1,913	/	1,381	3,215	/	3,143	2,214	/	2,355	0
	BEGIN PEAK HR		5:00 PM											
	VOLUMES	78	419	41	185	588	235	195	1,413	78	72	891	170	4,365
	APPROACH %	14%	78%	8%	18%	58%	23%	12%	84%	5%	6%	79%	15%	
	PEAK HR FACTOR		0.947			0.944			0.967			0.908		0.976
	APP/DEPART	538	/	784	1,008	/	738	1,686	/	1,639	1,133	/	1,204	0



APPENDIX C

Intersection Capacity Utilization/Delay and Level of Service Worksheets

Existing

Signal Hill Business Park

Vistro File: G:\...\AM Base.vistro
Report File: G:\...\E AM.pdf

Scenario 1 Existing
7/3/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Orange Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Thru	0.791	-	C
2	Orange Ave (NS) at Willow St (EW)	Signalized	ICU 1	NB Thru	0.733	-	C
3	Orange Ave (NS) at Burnett St (EW)	Signalized	ICU 1	NB Thru	0.633	-	B
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Right	0.704	-	C
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.612	23.2	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.047	12.5	B
7	Walnut Ave (NS) at Spring St (EW)	Signalized	ICU 1	WB Thru	0.621	-	B
8	Walnut Ave (NS) at Willow St (EW)	Signalized	ICU 1	WB Thru	0.508	-	A
9	Walnut Ave (NS) at Burnett St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.676	14.9	B
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.491	12.2	B
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	EB Thru	0.541	-	A
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	NB Thru	0.576	9.0	A
13	Gaviota Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Thru	0.008	11.5	B
14	Cherry Ave (NS) at Spring St (EW)	Signalized	ICU 1	NB Thru	0.751	-	C
15	Cherry Ave (NS) at Willow St (EW)	Signalized	ICU 1	WB Thru	0.714	-	C
16	Cherry Ave (NS) at Burnett St/Skyline Dr (EW)	Signalized	ICU 1	NB Thru	0.624	-	B
17	Cherry Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Thru	0.591	-	A
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	NB Thru	0.653	-	B

19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	NB Right	0.525	-	A
20	Cherry Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.783	28.2	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Orange Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.791

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	160.00	75.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	28	579	57	99	518	130	88	610	65	107	942	141
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	579	57	99	518	130	88	610	65	107	942	141
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	145	14	25	130	33	22	153	16	27	236	35
Total Analysis Volume [veh/h]	28	579	57	99	518	130	88	610	65	107	942	141
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.18	0.04	0.06	0.32	0.08	0.06	0.19	0.04	0.07	0.29	0.09
Intersection LOS	C											
Intersection V/C	0.791											

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.733

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	82	492	92	40	439	83	84	931	72	69	1128	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	82	492	92	40	439	83	84	931	72	69	1128	62
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	123	23	10	110	21	21	233	18	17	282	16
Total Analysis Volume [veh/h]	82	492	92	40	439	83	84	931	72	69	1128	62
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.31	0.00	0.03	0.27	0.05	0.05	0.21	0.21	0.04	0.25	0.25
Intersection LOS	C											
Intersection V/C	0.733											

Intersection Level Of Service Report
Intersection 3: Orange Ave (NS) at Burnett St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.633

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	110.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	21	616	30	32	536	11	24	96	28	57	64	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	616	30	32	536	11	24	96	28	57	64	22
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	154	8	8	134	3	6	24	7	14	16	6
Total Analysis Volume [veh/h]	21	616	30	32	536	11	24	96	28	57	64	22
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.39	0.02	0.02	0.34	0.01	0.02	0.09	0.09	0.04	0.09	0.09
Intersection LOS	B											
Intersection V/C	0.633											

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.704

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	40	667	22	28	526	25	78	90	38	47	124	57
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	40	667	22	28	526	25	78	90	38	47	124	57
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	167	6	7	132	6	20	23	10	12	31	14
Total Analysis Volume [veh/h]	40	667	22	28	526	25	78	90	38	47	124	57
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.43	0.43	0.02	0.34	0.34	0.05	0.11	0.02	0.03	0.11	0.04
Intersection LOS	C											
Intersection V/C	0.704											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	23.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.612

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	511	198	53	345	101	104	864	67	239	1360	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	98	511	198	53	345	101	104	864	67	239	1360	101
Peak Hour Factor	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	143	55	15	96	28	29	241	19	67	380	28
Total Analysis Volume [veh/h]	109	571	221	59	385	113	116	965	75	267	1520	113
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	13	34	0	25	46	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	24	24	44	24	24	24	7	38	38	16	47	47
g / C, Green / Cycle	0.26	0.26	0.48	0.26	0.26	0.26	0.08	0.43	0.43	0.18	0.52	0.52
(v / s)_i Volume / Saturation Flow Rate	0.11	0.16	0.14	0.07	0.11	0.07	0.07	0.19	0.19	0.15	0.30	0.31
s, saturation flow rate [veh/h]	998	3560	1589	841	3560	1589	1781	3560	1802	1781	3560	1805
c, Capacity [veh/h]	228	932	770	161	932	416	148	1520	769	317	1858	942
d1, Uniform Delay [s]	36.63	29.22	13.91	39.50	27.51	26.41	40.49	18.34	18.35	35.79	14.79	14.81
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.55	0.66	0.20	1.38	0.29	0.35	8.76	0.98	1.94	6.04	1.34	2.65
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.48	0.61	0.29	0.37	0.41	0.27	0.78	0.45	0.45	0.84	0.58	0.58
d, Delay for Lane Group [s/veh]	38.18	29.88	14.11	40.88	27.80	26.76	49.26	19.32	20.29	41.83	16.13	17.46
Lane Group LOS	D	C	B	D	C	C	D	B	C	D	B	B
Critical Lane Group	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.32	5.30	2.55	1.31	3.40	1.93	2.82	5.01	5.29	6.01	7.23	7.70
50th-Percentile Queue Length [ft/ln]	58.02	132.50	63.86	32.78	84.93	48.34	70.51	125.32	132.18	150.33	180.71	192.55
95th-Percentile Queue Length [veh/ln]	4.18	9.08	4.60	2.36	6.11	3.48	5.08	8.68	9.06	10.03	11.64	12.25
95th-Percentile Queue Length [ft/ln]	104.44	226.89	114.94	59.01	152.87	87.01	126.92	217.11	226.45	250.86	290.95	306.33

Movement, Approach, & Intersection Results

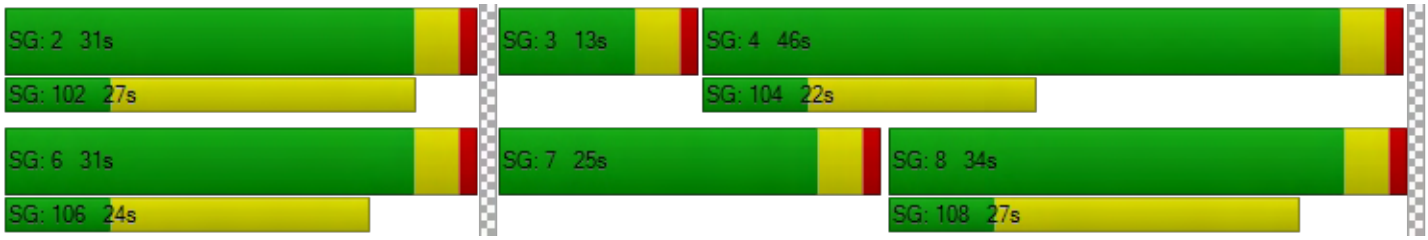
d_M, Delay for Movement [s/veh]	38.18	29.88	14.11	40.88	27.80	26.76	49.26	19.60	20.29	41.83	16.52	17.46
Movement LOS	D	C	B	D	C	C	D	B	C	D	B	B
d_A, Approach Delay [s/veh]	27.01			28.98			22.62			20.13		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	23.23											
Intersection LOS	C											
Intersection V/C	0.612											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.761	2.673	3.219	3.188
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	600	600	667	933
d_b, Bicycle Delay [s]	22.05	22.05	20.00	12.80
l_b,int, Bicycle LOS Score for Intersection	2.303	2.019	2.195	2.605
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	12.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.047

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	16	6	120	5	5	228
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	6	120	5	5	228
Peak Hour Factor	0.6710	0.6710	0.6710	0.6710	0.6710	0.6710
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	2	45	2	2	85
Total Analysis Volume [veh/h]	24	9	179	7	7	340
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	12.51	9.55	0.00	0.00	7.58	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.18	0.18	0.00	0.00	0.01	0.01
95th-Percentile Queue Length [ft/ln]	4.60	4.60	0.00	0.00	0.27	0.27
d_A, Approach Delay [s/veh]	11.70		0.00		0.15	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.78					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 7: Walnut Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.621

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	102.00	100.00	100.00	98.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	90	102	62	29	119	46	31	635	55	102	1052	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	90	102	62	29	119	46	31	635	55	102	1052	43
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	26	16	7	30	12	8	159	14	26	263	11
Total Analysis Volume [veh/h]	90	102	62	29	119	46	31	635	55	102	1052	43
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.06	0.04	0.02	0.10	0.10	0.02	0.22	0.22	0.06	0.34	0.34
Intersection LOS	B											
Intersection V/C	0.621											

Intersection Level Of Service Report
Intersection 8: Walnut Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.508

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	106.00	100.00	100.00	100.00	100.00	100.00	204.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	158	160	39	106	32	32	982	41	50	1199	69
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	51	158	160	39	106	32	32	982	41	50	1199	69
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	40	40	10	27	8	8	246	10	13	300	17
Total Analysis Volume [veh/h]	51	158	160	39	106	32	32	982	41	50	1199	69
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.10	0.10	0.02	0.03	0.02	0.02	0.21	0.21	0.03	0.26	0.26
Intersection LOS	A											
Intersection V/C	0.508											

Intersection Level Of Service Report
Intersection 9: Walnut Ave (NS) at Burnett St (EW)

Control Type:	All-way stop	Delay (sec / veh):	14.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.676

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	44	281	25	10	140	40	37	43	60	41	84	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	44	281	25	10	140	40	37	43	60	41	84	16
Peak Hour Factor	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	87	8	3	43	12	11	13	19	13	26	5
Total Analysis Volume [veh/h]	55	349	31	12	174	50	46	53	75	51	104	20
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	598	687	572	650	607	589
Degree of Utilization, x	0.68	0.05	0.32	0.08	0.29	0.30

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	5.16	0.14	1.40	0.25	1.18	1.24
95th-Percentile Queue Length [ft]	129.01	3.54	35.08	6.24	29.49	30.95
Approach Delay [s/veh]	19.50		11.29		11.30	11.67
Approach LOS	C		B		B	B
Intersection Delay [s/veh]	14.86					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	12.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.491

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	22	207	8	48	131	137	21	77	26	23	70	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	207	8	48	131	137	21	77	26	23	70	35
Peak Hour Factor	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	68	3	16	43	45	7	25	9	8	23	12
Total Analysis Volume [veh/h]	29	273	11	63	173	181	28	101	34	30	92	46
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	638	589	683	596	601
Degree of Utilization, x	0.49	0.40	0.26	0.27	0.28

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.71	1.92	1.06	1.11	1.14
95th-Percentile Queue Length [ft]	67.74	48.09	26.59	27.68	28.53
Approach Delay [s/veh]	13.96	11.55		11.30	11.31
Approach LOS	B	B		B	B
Intersection Delay [s/veh]	12.18				
Intersection LOS	B				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.541

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	167	44	34	125	44	64	107	82	47	105	25
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	167	44	34	125	44	64	107	82	47	105	25
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	42	11	9	31	11	16	27	21	12	26	6
Total Analysis Volume [veh/h]	49	167	44	34	125	44	64	107	82	47	105	25
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.13	0.13	0.02	0.11	0.11	0.04	0.16	0.16	0.03	0.11	0.11
Intersection LOS	A											
Intersection V/C	0.541											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	9.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.576

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	101	43	38	45	106	89	1032	83	34	1618	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	51	101	43	38	45	106	89	1032	83	34	1618	90
Peak Hour Factor	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	27	12	10	12	29	24	279	22	9	437	24
Total Analysis Volume [veh/h]	55	109	46	41	49	115	96	1116	90	37	1749	97
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	50.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	29	0	0	29	0	0	61	0	0	61	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	15	15	67	67	67	67	67	67
g / C, Green / Cycle	0.16	0.16	0.75	0.75	0.75	0.75	0.75	0.75
(v / s)_i Volume / Saturation Flow Rate	0.14	0.13	0.38	0.22	0.23	0.08	0.34	0.34
s, saturation flow rate [veh/h]	1488	1560	250	3560	1799	463	3560	1820
c, Capacity [veh/h]	291	300	230	2668	1348	384	2668	1364
d1, Uniform Delay [s]	36.49	36.18	11.79	3.65	3.65	5.80	4.30	4.30
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.37	2.74	5.51	0.29	0.57	0.50	0.57	1.11
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.72	0.68	0.42	0.30	0.30	0.10	0.46	0.46
d, Delay for Lane Group [s/veh]	39.86	38.92	17.31	3.93	4.22	6.30	4.87	5.42
Lane Group LOS	D	D	B	A	A	A	A	A
Critical Lane Group	Yes	No	Yes	No	No	No	No	No
50th-Percentile Queue Length [veh/ln]	4.68	4.48	1.47	1.86	1.99	0.28	3.36	3.66
50th-Percentile Queue Length [ft/ln]	116.97	111.95	36.74	46.54	49.71	7.10	84.07	91.40
95th-Percentile Queue Length [veh/ln]	8.23	7.95	2.65	3.35	3.58	0.51	6.05	6.58
95th-Percentile Queue Length [ft/ln]	205.66	198.71	66.14	83.76	89.48	12.78	151.33	164.51

Movement, Approach, & Intersection Results

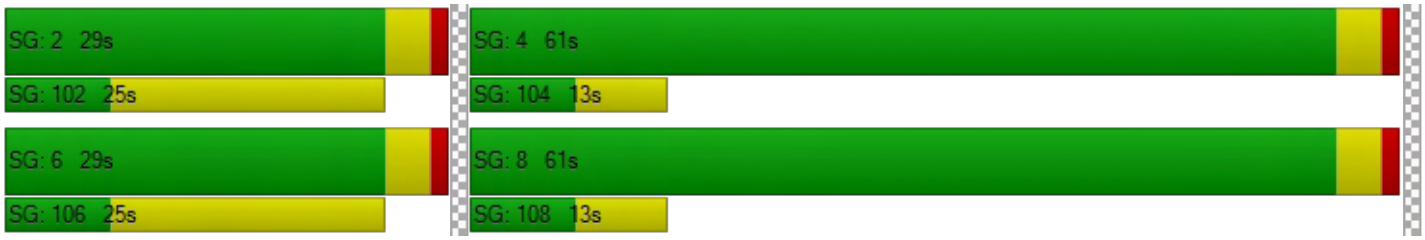
d_M, Delay for Movement [s/veh]	39.86	39.86	39.86	38.92	38.92	38.92	17.31	4.01	4.22	6.30	5.03	5.42
Movement LOS	D	D	D	D	D	D	B	A	A	A	A	A
d_A, Approach Delay [s/veh]	39.86			38.92			5.01			5.08		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	9.01											
Intersection LOS	A											
Intersection V/C	0.576											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	1.955	2.241	3.120	3.082
Crosswalk LOS	A	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	556	556	1267	1267
d_b, Bicycle Delay [s]	23.47	23.47	6.05	6.05
l_b,int, Bicycle LOS Score for Intersection	1.906	1.898	2.276	2.595
Bicycle LOS	A	A	B	B

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 13: Gaviota Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	11.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.008

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	16	4	16	18	1	12	3	115	12	15	97	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	4	16	18	1	12	3	115	12	15	97	5
Peak Hour Factor	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	1	5	6	0	4	1	36	4	5	30	2
Total Analysis Volume [veh/h]	20	5	20	22	1	15	4	142	15	19	120	6
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.01	0.02	0.04	0.00	0.02	0.00	0.00	0.00	0.01	0.00	0.00
d_M, Delay for Movement [s/veh]	11.23	11.46	9.33	11.29	11.45	9.15	7.45	0.00	0.00	7.54	0.00	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.20	0.20	0.20	0.17	0.17	0.17	0.01	0.01	0.01	0.03	0.03	0.03
95th-Percentile Queue Length [ft/ln]	5.06	5.06	5.06	4.31	4.31	4.31	0.15	0.15	0.15	0.79	0.79	0.79
d_A, Approach Delay [s/veh]	10.41			10.45			0.19			0.99		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	2.67											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.751

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	86	1069	170	281	1098	137	120	544	75	105	1052	358
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	86	1069	170	281	1098	137	120	544	75	105	1052	358
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	267	43	70	275	34	30	136	19	26	263	90
Total Analysis Volume [veh/h]	86	1069	170	281	1098	137	120	544	75	105	1052	358
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

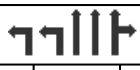
Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.26	0.26	0.09	0.26	0.26	0.08	0.13	0.13	0.07	0.22	0.22
Intersection LOS	C											
Intersection V/C	0.751											

Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.714

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	167	1031	161	149	765	147	177	836	85	231	1124	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	167	1031	161	149	765	147	177	836	85	231	1124	116
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	258	40	37	191	37	44	209	21	58	281	29
Total Analysis Volume [veh/h]	167	1031	161	149	765	147	177	836	85	231	1124	116
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.21	0.03	0.05	0.19	0.19	0.06	0.19	0.19	0.07	0.26	0.26
Intersection LOS	C											
Intersection V/C	0.714											

Intersection Level Of Service Report

Intersection 16: Cherry Ave (NS) at Burnett St/Skyline Dr (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.624

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	0	0	0	1
Pocket Length [ft]	193.00	100.00	96.00	200.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	94.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	34	1301	17	52	919	65	21	26	11	12	36	115
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	1301	17	52	919	65	21	26	11	12	36	115
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	325	4	13	230	16	5	7	3	3	9	29
Total Analysis Volume [veh/h]	34	1301	17	52	919	65	21	26	11	12	36	115
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.41	0.01	0.03	0.29	0.04	0.01	0.04	0.04	0.01	0.03	0.07
Intersection LOS	B											
Intersection V/C	0.624											

Intersection Level Of Service Report
Intersection 17: Cherry Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.591

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	0	0	0
Pocket Length [ft]	200.00	100.00	100.00	186.00	100.00	89.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	41	1200	4	11	844	88	112	1	55	6	3	23
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	41	1200	4	11	844	88	112	1	55	6	3	23
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	300	1	3	211	22	28	0	14	2	1	6
Total Analysis Volume [veh/h]	41	1200	4	11	844	88	112	1	55	6	3	23
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.38	0.00	0.01	0.26	0.06	0.07	0.11	0.11	0.00	0.02	0.02
Intersection LOS	A											
Intersection V/C	0.591											

Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.653

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	1035	10	62	763	88	79	47	62	11	77	150
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	1035	10	62	763	88	79	47	62	11	77	150
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	259	3	16	191	22	20	12	16	3	19	38
Total Analysis Volume [veh/h]	49	1035	10	62	763	88	79	47	62	11	77	150
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.32	0.01	0.04	0.24	0.06	0.05	0.08	0.04	0.01	0.14	0.14
Intersection LOS	B											
Intersection V/C	0.653											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.525

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	18	890	14	7	844	34	75	9	109	26	15	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	890	14	7	844	34	75	9	109	26	15	62
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	223	4	2	211	9	19	2	27	7	4	16
Total Analysis Volume [veh/h]	18	890	14	7	844	34	75	9	109	26	15	62
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.28	0.28	0.00	0.27	0.27	0.05	0.07	0.07	0.02	0.06	0.06
Intersection LOS	A											
Intersection V/C	0.525											

Intersection Level Of Service Report
Intersection 20: Cherry Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	28.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.783

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	118.00	135.00	100.00	100.00	180.00	100.00	100.00	186.00	100.00	100.00
Speed [mph]	30.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	78	565	22	129	432	256	190	919	65	34	1309	204
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	78	565	22	129	432	256	190	919	65	34	1309	204
Peak Hour Factor	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	150	6	34	115	68	50	244	17	9	347	54
Total Analysis Volume [veh/h]	83	600	23	137	459	272	202	976	69	36	1390	217
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	7.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	29	0	11	29	0	16	39	0	11	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	0	0	0	12	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	29	18	18	29	19	19	12	45	45	4	37	37
g / C, Green / Cycle	0.32	0.20	0.20	0.32	0.21	0.21	0.14	0.50	0.50	0.05	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.07	0.17	0.17	0.12	0.13	0.17	0.11	0.19	0.19	0.02	0.30	0.30
s, saturation flow rate [veh/h]	1175	1870	1846	1107	3560	1589	1781	3560	1807	1781	3560	1744
c, Capacity [veh/h]	384	371	366	342	735	328	241	1778	902	85	1464	717
d1, Uniform Delay [s]	22.57	34.83	34.83	24.04	32.59	34.25	38.00	14.04	14.04	41.75	22.42	22.43
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.28	5.34	5.44	0.76	0.87	5.35	7.48	0.65	1.27	3.35	3.34	6.67
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.22	0.85	0.85	0.40	0.62	0.83	0.84	0.39	0.39	0.42	0.74	0.74
d, Delay for Lane Group [s/veh]	22.85	40.17	40.27	24.79	33.46	39.59	45.48	14.68	15.31	45.10	25.76	29.10
Lane Group LOS	C	D	D	C	C	D	D	B	B	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.26	7.02	6.95	2.17	4.56	6.06	4.72	4.20	4.42	0.84	9.65	10.13
50th-Percentile Queue Length [ft/ln]	31.53	175.48	173.64	54.28	114.03	151.45	118.08	104.98	110.59	21.02	241.32	253.27
95th-Percentile Queue Length [veh/ln]	2.27	11.36	11.27	3.91	8.06	10.09	8.29	7.56	7.87	1.51	14.75	15.35
95th-Percentile Queue Length [ft/ln]	56.76	284.10	281.69	97.71	201.60	252.36	207.19	188.97	196.83	37.84	368.70	383.77

Movement, Approach, & Intersection Results

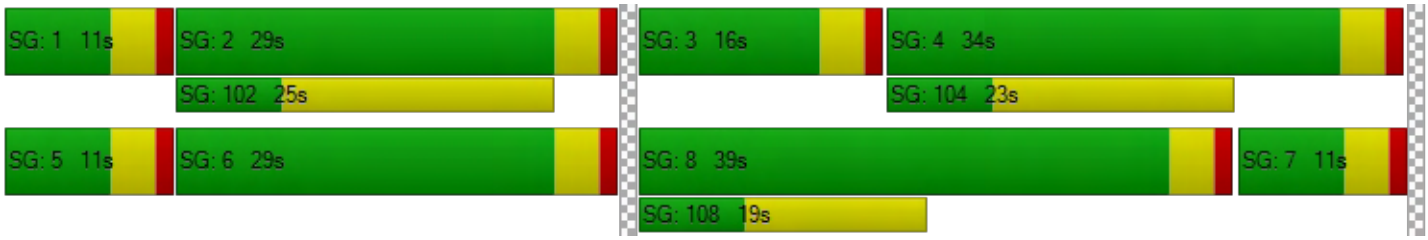
d_M, Delay for Movement [s/veh]	22.85	40.22	40.27	24.79	33.46	39.59	45.48	14.87	15.31	45.10	26.51	29.10
Movement LOS	C	D	D	C	C	D	D	B	B	D	C	C
d_A, Approach Delay [s/veh]	38.18			34.01			19.85			27.26		
Approach LOS	D			C			B			C		
d_I, Intersection Delay [s/veh]	28.23											
Intersection LOS	C											
Intersection V/C	0.783											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.547	2.759	0.000	3.088
Crosswalk LOS	B	C	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	556	556	778	667
d_b, Bicycle Delay [s]	23.47	23.47	16.81	20.00
l_b,int, Bicycle LOS Score for Intersection	2.142	2.276	2.245	2.463
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Signal Hill Business Park

Vistro File: G:\...\PM Base.vistro
Report File: G:\...\E PM.pdf

Scenario 1 Existing
7/3/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Orange Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Thru	0.812	-	D
2	Orange Ave (NS) at Willow St (EW)	Signalized	ICU 1	EB Thru	0.846	-	D
3	Orange Ave (NS) at Burnett St (EW)	Signalized	ICU 1	SB Thru	0.608	-	B
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	SB Right	0.632	-	B
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.633	21.4	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.008	11.0	B
7	Walnut Ave (NS) at Spring St (EW)	Signalized	ICU 1	EB Thru	0.656	-	B
8	Walnut Ave (NS) at Willow St (EW)	Signalized	ICU 1	EB Thru	0.650	-	B
9	Walnut Ave (NS) at Burnett St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.548	13.3	B
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	SB Thru	0.452	11.9	B
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	NB Thru	0.493	-	A
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	SB Thru	0.559	9.1	A
13	Gaviota Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Thru	0.002	12.2	B
14	Cherry Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Thru	0.729	-	C
15	Cherry Ave (NS) at Willow St (EW)	Signalized	ICU 1	EB Thru	0.853	-	D
16	Cherry Ave (NS) at Burnett St/Skyline Dr (EW)	Signalized	ICU 1	SB Thru	0.608	-	B
17	Cherry Ave (NS) at Hill St (EW)	Signalized	ICU 1	SB Thru	0.626	-	B
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	SB Thru	0.593	-	A

19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	SB Thru	0.491	-	A
20	Cherry Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.671	25.2	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Orange Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.812

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	160.00	75.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	58	586	58	102	564	190	129	935	54	50	662	160
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	58	586	58	102	564	190	129	935	54	50	662	160
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	147	15	26	141	48	32	234	14	13	166	40
Total Analysis Volume [veh/h]	58	586	58	102	564	190	129	935	54	50	662	160
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.18	0.04	0.06	0.35	0.12	0.08	0.29	0.03	0.03	0.21	0.10
Intersection LOS	D											
Intersection V/C	0.812											

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.846

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	460	101	73	500	67	89	1451	74	135	1077	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	51	460	101	73	500	67	89	1451	74	135	1077	81
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	115	25	18	125	17	22	363	19	34	269	20
Total Analysis Volume [veh/h]	51	460	101	73	500	67	89	1451	74	135	1077	81
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.29	0.00	0.05	0.31	0.04	0.06	0.32	0.32	0.08	0.24	0.24
Intersection LOS	D											
Intersection V/C	0.846											

Intersection Level Of Service Report
Intersection 3: Orange Ave (NS) at Burnett St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.608

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	110.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	10	552	35	26	649	29	17	47	20	40	66	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	552	35	26	649	29	17	47	20	40	66	30
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	138	9	7	162	7	4	12	5	10	17	8
Total Analysis Volume [veh/h]	10	552	35	26	649	29	17	47	20	40	66	30
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.35	0.02	0.02	0.41	0.02	0.01	0.05	0.05	0.03	0.09	0.09
Intersection LOS	B											
Intersection V/C	0.608											

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.632

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	31	563	33	27	592	43	36	107	30	42	103	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	563	33	27	592	43	36	107	30	42	103	34
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	141	8	7	148	11	9	27	8	11	26	9
Total Analysis Volume [veh/h]	31	563	33	27	592	43	36	107	30	42	103	34
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.37	0.37	0.02	0.40	0.40	0.02	0.09	0.02	0.03	0.09	0.02
Intersection LOS	B											
Intersection V/C	0.632											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	21.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.633

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	73	495	277	80	499	97	84	1383	105	183	879	79
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	73	495	277	80	499	97	84	1383	105	183	879	79
Peak Hour Factor	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	127	71	20	128	25	22	354	27	47	225	20
Total Analysis Volume [veh/h]	75	507	284	82	511	99	86	1417	108	188	901	81
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	11	34	0	15	38	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	38	22	22	22	6	34	34	12	40	40
g / C, Green / Cycle	0.27	0.27	0.47	0.27	0.27	0.27	0.08	0.43	0.43	0.15	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.08	0.14	0.18	0.09	0.14	0.06	0.05	0.28	0.28	0.11	0.18	0.18
s, saturation flow rate [veh/h]	889	3560	1589	892	3560	1589	1781	3560	1803	1781	3560	1792
c, Capacity [veh/h]	201	973	749	202	973	434	137	1527	773	264	1781	896
d1, Uniform Delay [s]	33.54	24.68	13.64	33.74	24.71	22.57	35.89	18.27	18.27	32.53	12.27	12.27
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.15	0.43	0.32	1.31	0.44	0.26	4.67	2.28	4.45	3.57	0.58	1.16
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.37	0.52	0.38	0.41	0.53	0.23	0.63	0.66	0.66	0.71	0.37	0.37
d, Delay for Lane Group [s/veh]	34.70	25.11	13.96	35.04	25.15	22.84	40.57	20.55	22.72	36.10	12.85	13.43
Lane Group LOS	C	C	B	D	C	C	D	C	C	D	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.40	3.91	3.06	1.57	4.01	1.43	1.75	7.27	7.83	3.60	3.35	3.52
50th-Percentile Queue Length [ft/ln]	35.07	97.74	76.41	39.18	100.34	35.78	43.86	181.80	195.85	89.90	83.70	88.01
95th-Percentile Queue Length [veh/ln]	2.52	7.04	5.50	2.82	7.22	2.58	3.16	11.69	12.42	6.47	6.03	6.34
95th-Percentile Queue Length [ft/ln]	63.12	175.94	137.53	70.52	180.62	64.41	78.96	292.36	310.61	161.82	150.65	158.42

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.70	25.11	13.96	35.04	25.15	22.84	40.57	21.17	22.72	36.10	13.01	13.43
Movement LOS	C	C	B	D	C	C	D	C	C	D	B	B
d_A, Approach Delay [s/veh]	22.29			25.99			22.31			16.75		
Approach LOS	C			C			C			B		
d_I, Intersection Delay [s/veh]	21.39											
Intersection LOS	C											
Intersection V/C	0.633											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.763	2.668	3.130	3.184
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	675	675	750	850
d_b, Bicycle Delay [s]	17.56	17.56	15.63	13.23
l_b,int, Bicycle LOS Score for Intersection	2.274	2.131	2.446	2.203
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	11.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.008

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	4	6	146	4	4	179
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	6	146	4	4	179
Peak Hour Factor	0.8490	0.8490	0.8490	0.8490	0.8490	0.8490
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	2	43	1	1	53
Total Analysis Volume [veh/h]	5	7	172	5	5	211
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.97	9.20	0.00	0.00	7.56	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.05	0.05	0.00	0.00	0.01	0.01
95th-Percentile Queue Length [ft/ln]	1.23	1.23	0.00	0.00	0.21	0.21
d_A, Approach Delay [s/veh]	9.94		0.00		0.17	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.39					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 7: Walnut Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.656

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	102.00	100.00	100.00	98.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	106	214	137	42	109	29	73	1046	91	65	738	66
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	106	214	137	42	109	29	73	1046	91	65	738	66
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	54	34	11	27	7	18	262	23	16	185	17
Total Analysis Volume [veh/h]	106	214	137	42	109	29	73	1046	91	65	738	66
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.13	0.09	0.03	0.09	0.09	0.05	0.36	0.36	0.04	0.25	0.25
Intersection LOS	B											
Intersection V/C	0.656											

Intersection Level Of Service Report
Intersection 8: Walnut Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.650

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	106.00	100.00	100.00	100.00	100.00	100.00	204.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	61	179	183	80	152	51	49	1520	56	94	1168	60
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	61	179	183	80	152	51	49	1520	56	94	1168	60
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	45	46	20	38	13	12	380	14	24	292	15
Total Analysis Volume [veh/h]	61	179	183	80	152	51	49	1520	56	94	1168	60
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.11	0.11	0.05	0.05	0.03	0.03	0.33	0.33	0.06	0.26	0.26
Intersection LOS	B											
Intersection V/C	0.650											

Intersection Level Of Service Report
Intersection 9: Walnut Ave (NS) at Burnett St (EW)

Control Type:	All-way stop	Delay (sec / veh):	13.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.548

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	15	298	21	22	253	22	53	76	15	21	64	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	298	21	22	253	22	53	76	15	21	64	13
Peak Hour Factor	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	81	6	6	69	6	14	21	4	6	17	4
Total Analysis Volume [veh/h]	16	325	23	24	276	24	58	83	16	23	70	14
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	622	712	615	705	602	594
Degree of Utilization, x	0.55	0.03	0.49	0.03	0.26	0.18

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.33	0.10	2.68	0.11	1.04	0.65
95th-Percentile Queue Length [ft]	83.20	2.50	66.92	2.64	25.98	16.30
Approach Delay [s/veh]	14.83		13.56		11.08	10.39
Approach LOS	B		B		B	B
Intersection Delay [s/veh]	13.28					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	11.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.452

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	23	201	22	34	217	57	34	100	21	21	96	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	23	201	22	34	217	57	34	100	21	21	96	33
Peak Hour Factor	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	55	6	9	59	16	9	27	6	6	26	9
Total Analysis Volume [veh/h]	25	220	24	37	237	62	37	109	23	23	105	36
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	653	606	697	618	624
Degree of Utilization, x	0.41	0.45	0.09	0.27	0.26

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.02	2.34	0.29	1.11	1.05
95th-Percentile Queue Length [ft]	50.40	58.59	7.29	27.66	26.26
Approach Delay [s/veh]	12.32	12.51		11.00	10.81
Approach LOS	B	B		B	B
Intersection Delay [s/veh]	11.89				
Intersection LOS	B				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.493

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	26	199	44	28	193	31	47	83	29	39	37	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	199	44	28	193	31	47	83	29	39	37	21
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	50	11	7	48	8	12	21	7	10	9	5
Total Analysis Volume [veh/h]	26	199	44	28	193	31	47	83	29	39	37	21
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.15	0.15	0.02	0.14	0.14	0.03	0.10	0.10	0.02	0.06	0.06
Intersection LOS	A											
Intersection V/C	0.493											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	9.1
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.559

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	25	106	29	51	134	84	107	1682	54	58	1030	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	106	29	51	134	84	107	1682	54	58	1030	61
Peak Hour Factor	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	28	8	13	35	22	28	442	14	15	270	16
Total Analysis Volume [veh/h]	26	111	30	54	141	88	112	1767	57	61	1082	64
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	33.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	29	0	0	29	0	0	51	0	0	51	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	15	15	57	57	57	57	57	57
g / C, Green / Cycle	0.19	0.19	0.71	0.71	0.71	0.71	0.71	0.71
(v / s)_i Volume / Saturation Flow Rate	0.10	0.17	0.23	0.34	0.34	0.24	0.21	0.21
s, saturation flow rate [veh/h]	1703	1712	491	3560	1840	256	3560	1817
c, Capacity [veh/h]	374	377	385	2532	1309	226	2532	1292
d1, Uniform Delay [s]	28.96	31.32	8.26	5.03	5.04	11.60	4.24	4.24
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.84	3.03	1.91	0.64	1.24	2.93	0.30	0.60
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.45	0.75	0.29	0.47	0.48	0.27	0.30	0.30
d, Delay for Lane Group [s/veh]	29.80	34.35	10.17	5.67	6.28	14.53	4.54	4.83
Lane Group LOS	C	C	B	A	A	B	A	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.87	5.42	1.07	3.43	3.77	0.79	1.81	1.95
50th-Percentile Queue Length [ft/ln]	71.74	135.61	26.84	85.81	94.36	19.73	45.27	48.87
95th-Percentile Queue Length [veh/ln]	5.17	9.24	1.93	6.18	6.79	1.42	3.26	3.52
95th-Percentile Queue Length [ft/ln]	129.14	231.11	48.31	154.45	169.85	35.51	81.49	87.97

Movement, Approach, & Intersection Results

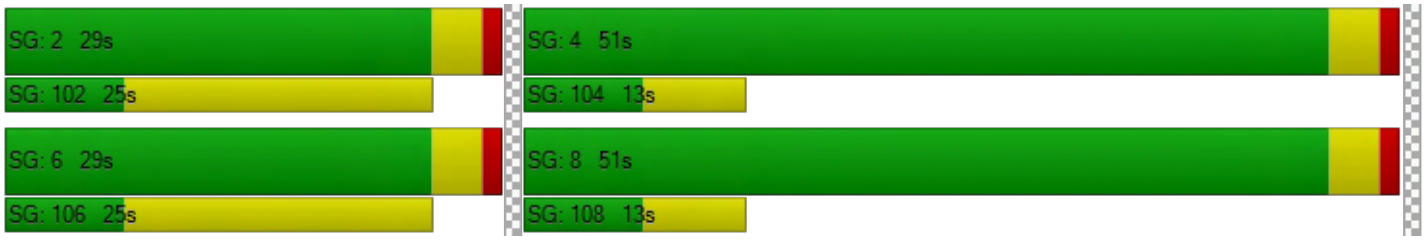
d_M, Delay for Movement [s/veh]	29.80	29.80	29.80	34.35	34.35	34.35	10.17	5.87	6.28	14.53	4.63	4.83
Movement LOS	C	C	C	C	C	C	B	A	A	B	A	A
d_A, Approach Delay [s/veh]	29.80			34.35			6.13			5.14		
Approach LOS	C			C			A			A		
d_I, Intersection Delay [s/veh]	9.12											
Intersection LOS	A											
Intersection V/C	0.559											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.003	2.278	3.061	3.090
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	625	625	1175	1175
d_b, Bicycle Delay [s]	18.91	18.91	6.81	6.81
l_b,int, Bicycle LOS Score for Intersection	1.835	2.027	2.624	2.223
Bicycle LOS	A	B	B	B

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 13: Gaviota Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	12.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	7	1	17	12	1	14	16	136	5	12	125	18
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	1	17	12	1	14	16	136	5	12	125	18
Peak Hour Factor	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	0	5	4	0	4	5	41	2	4	38	5
Total Analysis Volume [veh/h]	9	1	21	15	1	17	20	166	6	15	152	22
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.02	0.03	0.00	0.02	0.01	0.00	0.00	0.01	0.00	0.00
d_M, Delay for Movement [s/veh]	11.99	12.17	9.31	12.10	12.16	9.34	7.58	0.00	0.00	7.57	0.00	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.13	0.13	0.13	0.16	0.16	0.16	0.03	0.03	0.03	0.03	0.03	0.03
95th-Percentile Queue Length [ft/ln]	3.34	3.34	3.34	3.90	3.90	3.90	0.86	0.86	0.86	0.64	0.64	0.64
d_A, Approach Delay [s/veh]	10.18			10.68			0.79			0.60		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	2.10											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.729

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	1170	144	228	1250	109	155	916	128	93	656	368
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	98	1170	144	228	1250	109	155	916	128	93	656	368
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	293	36	57	313	27	39	229	32	23	164	92
Total Analysis Volume [veh/h]	98	1170	144	228	1250	109	155	916	128	93	656	368
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

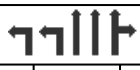
Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.27	0.27	0.07	0.28	0.28	0.10	0.22	0.22	0.06	0.16	0.16
Intersection LOS	C											
Intersection V/C	0.729											

Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.853

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	166	835	219	303	980	183	211	1292	132	318	990	175
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	166	835	219	303	980	183	211	1292	132	318	990	175
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	209	55	76	245	46	53	323	33	80	248	44
Total Analysis Volume [veh/h]	166	835	219	303	980	183	211	1292	132	318	990	175
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.17	0.04	0.09	0.24	0.24	0.07	0.30	0.30	0.10	0.24	0.24
Intersection LOS	D											
Intersection V/C	0.853											

Intersection Level Of Service Report

Intersection 16: Cherry Ave (NS) at Burnett St/Skyline Dr (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.608

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	0	0	0	1
Pocket Length [ft]	193.00	100.00	96.00	200.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	94.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	7	1064	31	132	1321	57	38	26	25	26	18	107
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	1064	31	132	1321	57	38	26	25	26	18	107
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	266	8	33	330	14	10	7	6	7	5	27
Total Analysis Volume [veh/h]	7	1064	31	132	1321	57	38	26	25	26	18	107
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.33	0.02	0.08	0.41	0.04	0.02	0.06	0.06	0.02	0.03	0.07
Intersection LOS	B											
Intersection V/C	0.608											

Intersection Level Of Service Report
Intersection 17: Cherry Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.626

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	0	0	0
Pocket Length [ft]	200.00	100.00	100.00	186.00	100.00	89.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	975	9	21	1214	135	112	2	66	5	2	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	975	9	21	1214	135	112	2	66	5	2	10
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	244	2	5	304	34	28	1	17	1	1	3
Total Analysis Volume [veh/h]	49	975	9	21	1214	135	112	2	66	5	2	10
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.30	0.01	0.01	0.38	0.08	0.07	0.11	0.11	0.00	0.01	0.01
Intersection LOS	B											
Intersection V/C	0.626											

Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.593

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	13	862	11	167	1071	44	55	35	13	7	16	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	862	11	167	1071	44	55	35	13	7	16	120
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	216	3	42	268	11	14	9	3	2	4	30
Total Analysis Volume [veh/h]	13	862	11	167	1071	44	55	35	13	7	16	120
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.27	0.01	0.10	0.33	0.03	0.03	0.06	0.01	0.00	0.09	0.09
Intersection LOS	A											
Intersection V/C	0.593											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.491

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	2	822	11	16	1054	16	21	6	24	15	6	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	822	11	16	1054	16	21	6	24	15	6	38
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	206	3	4	264	4	5	2	6	4	2	10
Total Analysis Volume [veh/h]	2	822	11	16	1054	16	21	6	24	15	6	38
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.26	0.26	0.01	0.33	0.33	0.01	0.02	0.02	0.01	0.04	0.04
Intersection LOS	A											
Intersection V/C	0.491											

Intersection Level Of Service Report
Intersection 20: Cherry Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	25.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.671

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	118.00	135.00	100.00	100.00	180.00	100.00	100.00	186.00	100.00	100.00
Speed [mph]	30.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	78	419	41	185	588	235	195	1413	78	72	891	170
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	78	419	41	185	588	235	195	1413	78	72	891	170
Peak Hour Factor	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	107	11	47	151	60	50	362	20	18	228	44
Total Analysis Volume [veh/h]	80	429	42	190	602	241	200	1448	80	74	913	174
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	29	0	11	29	0	13	29	0	11	27	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	0	0	0	12	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	16	16	27	17	17	11	35	35	6	30	30
g / C, Green / Cycle	0.34	0.20	0.20	0.34	0.21	0.21	0.14	0.44	0.44	0.07	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.07	0.13	0.13	0.16	0.17	0.15	0.11	0.28	0.28	0.04	0.21	0.21
s, saturation flow rate [veh/h]	1100	1870	1812	1210	3560	1589	1781	3560	1820	1781	3560	1721
c, Capacity [veh/h]	374	373	362	434	762	340	244	1568	802	128	1338	647
d1, Uniform Delay [s]	19.57	29.45	29.47	20.38	29.83	29.21	33.67	17.54	17.55	36.03	19.68	19.70
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.28	1.82	1.91	0.69	1.89	2.73	6.75	2.06	3.98	4.04	1.61	3.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.21	0.64	0.64	0.44	0.79	0.71	0.82	0.64	0.65	0.58	0.55	0.55
d, Delay for Lane Group [s/veh]	19.85	31.27	31.38	21.08	31.71	31.94	40.41	19.60	21.53	40.07	21.29	23.03
Lane Group LOS	B	C	C	C	C	C	D	B	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.02	4.27	4.18	2.61	5.49	4.41	4.09	7.02	7.61	1.50	5.26	5.41
50th-Percentile Queue Length [ft/ln]	25.59	106.81	104.39	65.20	137.35	110.23	102.14	175.47	190.36	37.48	131.39	135.27
95th-Percentile Queue Length [veh/ln]	1.84	7.66	7.52	4.69	9.34	7.85	7.35	11.36	12.14	2.70	9.02	9.23
95th-Percentile Queue Length [ft/ln]	46.06	191.55	187.90	117.37	233.44	196.32	183.85	284.09	303.50	67.46	225.39	230.63

Movement, Approach, & Intersection Results

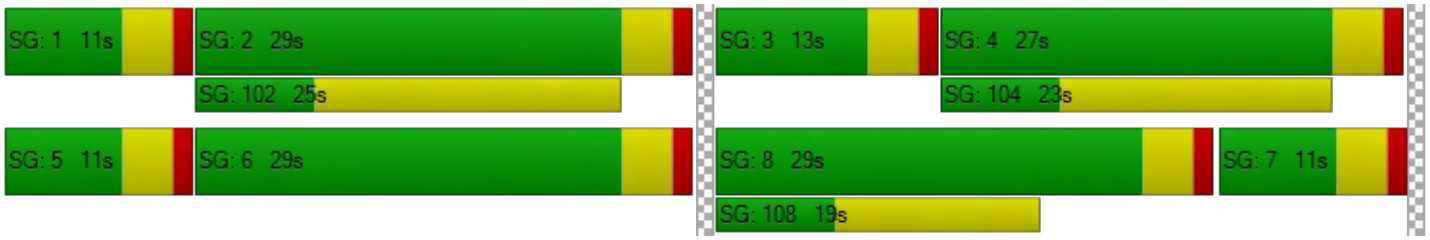
d_M, Delay for Movement [s/veh]	19.85	31.32	31.38	21.08	31.71	31.94	40.41	20.18	21.53	40.07	21.64	23.03
Movement LOS	B	C	C	C	C	C	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	29.66			29.81			22.59			23.02		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	25.24											
Intersection LOS	C											
Intersection V/C	0.671											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	0.00	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.548	2.745	0.000	3.110
Crosswalk LOS	B	B	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	625	625	625	575
d_b, Bicycle Delay [s]	18.91	18.91	18.91	20.31
l_b,int, Bicycle LOS Score for Intersection	2.014	2.412	2.510	2.198
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Existing Plus Project

Signal Hill Business Park

Vistro File: G:\...\AM Base.vistro
Report File: G:\...\EP AM.pdf

Scenario 2 Existing Plus Project
7/3/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Orange Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Thru	0.810	-	D
2	Orange Ave (NS) at Willow St (EW)	Signalized	ICU 1	NB Thru	0.748	-	C
3	Orange Ave (NS) at Burnett St (EW)	Signalized	ICU 1	NB Thru	0.639	-	B
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Right	0.736	-	C
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.614	23.3	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.073	13.4	B
7	Walnut Ave (NS) at Spring St (EW)	Signalized	ICU 1	WB Thru	0.626	-	B
8	Walnut Ave (NS) at Willow St (EW)	Signalized	ICU 1	WB Thru	0.509	-	A
9	Walnut Ave (NS) at Burnett St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.680	15.0	C
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.569	14.3	B
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	NB Thru	0.588	-	A
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	NB Thru	0.823	10.0	A
13	Gaviota Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	SB Thru	0.002	12.2	B
14	Cherry Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Thru	0.752	-	C
15	Cherry Ave (NS) at Willow St (EW)	Signalized	ICU 1	WB Thru	0.719	-	C
16	Cherry Ave (NS) at Burnett St/Skyline Dr (EW)	Signalized	ICU 1	NB Thru	0.628	-	B
17	Cherry Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Thru	0.598	-	A
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	NB Thru	0.655	-	B

19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	NB Right	0.525	-	A
20	Cherry Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.788	28.4	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Orange Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.810

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	160.00	75.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	28	579	57	99	518	130	88	610	65	107	942	141
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	5	0	0	31	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	584	57	99	549	130	88	610	65	107	942	141
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	146	14	25	137	33	22	153	16	27	236	35
Total Analysis Volume [veh/h]	28	584	57	99	549	130	88	610	65	107	942	141
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.18	0.04	0.06	0.34	0.08	0.06	0.19	0.04	0.07	0.29	0.09
Intersection LOS	D											
Intersection V/C	0.810											

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.748

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	82	492	92	40	439	83	84	931	72	69	1128	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	4	5	0	0	31	0	0	0	20	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	86	497	92	40	470	83	84	931	92	69	1128	62
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	124	23	10	118	21	21	233	23	17	282	16
Total Analysis Volume [veh/h]	86	497	92	40	470	83	84	931	92	69	1128	62
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.31	0.00	0.03	0.29	0.05	0.05	0.21	0.21	0.04	0.25	0.25
Intersection LOS	C											
Intersection V/C	0.748											

Intersection Level Of Service Report
Intersection 3: Orange Ave (NS) at Burnett St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.639

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	110.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	21	616	30	32	536	11	24	96	28	57	64	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	9	0	0	51	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	625	30	32	587	11	24	96	28	57	64	22
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	156	8	8	147	3	6	24	7	14	16	6
Total Analysis Volume [veh/h]	21	625	30	32	587	11	24	96	28	57	64	22
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.39	0.02	0.02	0.37	0.01	0.02	0.09	0.09	0.04	0.09	0.09
Intersection LOS	B											
Intersection V/C	0.639											

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.736

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	40	667	22	28	526	25	78	90	38	47	124	57
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	51	0	0	0	8	0	0	1	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	40	667	22	79	526	25	78	98	38	47	125	66
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	167	6	20	132	6	20	25	10	12	31	17
Total Analysis Volume [veh/h]	40	667	22	79	526	25	78	98	38	47	125	66
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.43	0.43	0.05	0.34	0.34	0.05	0.11	0.02	0.03	0.11	0.04
Intersection LOS	C											
Intersection V/C	0.736											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	23.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.614

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	511	198	53	345	101	104	864	67	239	1360	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	8	0	0	0	0	39	0	1	7	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	98	511	206	53	345	101	104	903	67	240	1367	101
Peak Hour Factor	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	143	58	15	96	28	29	252	19	67	382	28
Total Analysis Volume [veh/h]	109	571	230	59	385	113	116	1009	75	268	1527	113
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	13	34	0	25	46	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	24	24	44	24	24	24	7	38	38	16	47	47
g / C, Green / Cycle	0.26	0.26	0.49	0.26	0.26	0.26	0.08	0.43	0.43	0.18	0.52	0.52
(v / s)_i Volume / Saturation Flow Rate	0.11	0.16	0.14	0.07	0.11	0.07	0.07	0.20	0.20	0.15	0.31	0.31
s, saturation flow rate [veh/h]	998	3560	1589	841	3560	1589	1781	3560	1805	1781	3560	1805
c, Capacity [veh/h]	228	932	771	161	932	416	148	1517	769	318	1858	942
d1, Uniform Delay [s]	36.63	29.22	13.96	39.50	27.51	26.41	40.49	18.58	18.58	35.75	14.82	14.84
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.55	0.66	0.21	1.38	0.29	0.35	8.76	1.06	2.09	6.00	1.36	2.68
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.48	0.61	0.30	0.37	0.41	0.27	0.78	0.47	0.47	0.84	0.59	0.59
d, Delay for Lane Group [s/veh]	38.18	29.88	14.18	40.88	27.80	26.76	49.26	19.64	20.68	41.74	16.17	17.52
Lane Group LOS	D	C	B	D	C	C	D	B	C	D	B	B
Critical Lane Group	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.32	5.30	2.67	1.31	3.40	1.93	2.82	5.29	5.59	6.03	7.27	7.75
50th-Percentile Queue Length [ft/ln]	58.02	132.50	66.78	32.78	84.93	48.34	70.51	132.27	139.76	150.75	181.84	193.84
95th-Percentile Queue Length [veh/ln]	4.18	9.08	4.81	2.36	6.11	3.48	5.08	9.06	9.47	10.06	11.70	12.32
95th-Percentile Queue Length [ft/ln]	104.44	226.89	120.20	59.01	152.87	87.01	126.92	226.58	236.70	251.43	292.42	308.00

Movement, Approach, & Intersection Results

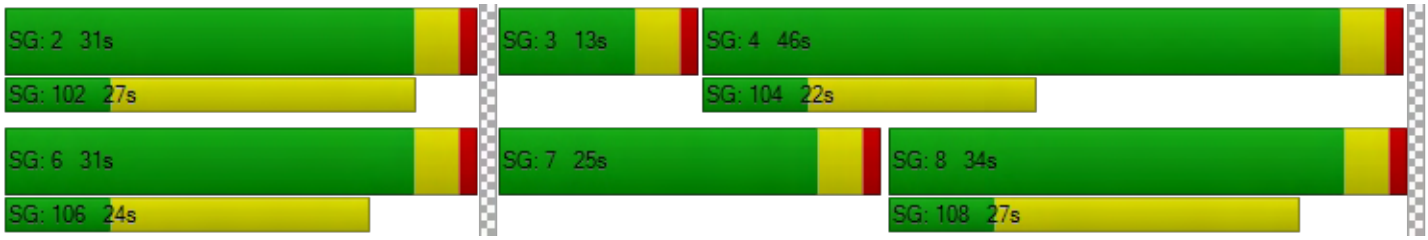
d_M, Delay for Movement [s/veh]	38.18	29.88	14.18	40.88	27.80	26.76	49.26	19.94	20.68	41.74	16.56	17.52
Movement LOS	D	C	B	D	C	C	D	B	C	D	B	B
d_A, Approach Delay [s/veh]	26.90			28.98			22.82			20.15		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	23.27											
Intersection LOS	C											
Intersection V/C	0.614											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.763	2.673	3.228	3.198
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	600	600	667	933
d_b, Bicycle Delay [s]	22.05	22.05	20.00	12.80
l_b,int, Bicycle LOS Score for Intersection	2.310	2.019	2.220	2.609
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	13.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.073

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	16	6	120	5	5	228
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	7	0	18	42	0	4
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	23	6	138	47	5	232
Peak Hour Factor	0.6710	0.6710	0.6710	0.6710	0.6710	0.6710
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	2	51	18	2	86
Total Analysis Volume [veh/h]	34	9	206	70	7	346
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.01	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	13.42	10.14	0.00	0.00	7.79	0.00
Movement LOS	B	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.28	0.28	0.00	0.00	0.01	0.01
95th-Percentile Queue Length [ft/ln]	6.90	6.90	0.00	0.00	0.29	0.29
d_A, Approach Delay [s/veh]	12.73		0.00		0.15	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.90					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 7: Walnut Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.626

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	102.00	100.00	100.00	98.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	90	102	62	29	119	46	31	635	55	102	1052	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	8	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	90	103	62	29	127	46	31	635	55	102	1052	43
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	26	16	7	32	12	8	159	14	26	263	11
Total Analysis Volume [veh/h]	90	103	62	29	127	46	31	635	55	102	1052	43
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.06	0.04	0.02	0.11	0.11	0.02	0.22	0.22	0.06	0.34	0.34
Intersection LOS	B											
Intersection V/C	0.626											

Intersection Level Of Service Report
Intersection 8: Walnut Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.509

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	106.00	100.00	100.00	100.00	100.00	100.00	204.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	158	160	39	106	32	32	982	41	50	1199	69
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	8	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	51	159	160	39	114	32	32	982	41	50	1199	69
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	40	40	10	29	8	8	246	10	13	300	17
Total Analysis Volume [veh/h]	51	159	160	39	114	32	32	982	41	50	1199	69
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.10	0.10	0.02	0.04	0.02	0.02	0.21	0.21	0.03	0.26	0.26
Intersection LOS	A											
Intersection V/C	0.509											

Intersection Level Of Service Report
Intersection 9: Walnut Ave (NS) at Burnett St (EW)

Control Type:	All-way stop	Delay (sec / veh):	15.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.680

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	44	281	25	10	140	40	37	43	60	41	84	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	8	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	44	282	25	10	148	40	37	43	60	41	84	16
Peak Hour Factor	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	88	8	3	46	12	11	13	19	13	26	5
Total Analysis Volume [veh/h]	55	350	31	12	184	50	46	53	75	51	104	20
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	595	684	571	648	603	586
Degree of Utilization, x	0.68	0.05	0.34	0.08	0.29	0.30

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	5.23	0.14	1.52	0.25	1.19	1.25
95th-Percentile Queue Length [ft]	130.86	3.56	37.93	6.25	29.76	31.22
Approach Delay [s/veh]	19.76		11.53		11.37	11.75
Approach LOS	C		B		B	B
Intersection Delay [s/veh]	15.02					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	14.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.569

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	22	207	8	48	131	137	21	77	26	23	70	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	4	1	11	0	8	0	0	0	18	53	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	208	19	48	139	137	21	77	44	76	70	35
Peak Hour Factor	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	69	6	16	46	45	7	25	14	25	23	12
Total Analysis Volume [veh/h]	34	274	25	63	183	181	28	101	58	100	92	46
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	586	542	621	557	559
Degree of Utilization, x	0.57	0.45	0.29	0.34	0.43

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.56	2.35	1.21	1.47	2.12
95th-Percentile Queue Length [ft]	88.92	58.70	30.24	36.80	52.89
Approach Delay [s/veh]	16.95	13.12		12.71	14.15
Approach LOS	C	B		B	B
Intersection Delay [s/veh]	14.34				
Intersection LOS	B				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.588

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	167	44	34	125	44	64	107	82	47	105	25
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	75	0	0	13	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	242	44	34	138	44	64	107	82	47	105	25
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	61	11	9	35	11	16	27	21	12	26	6
Total Analysis Volume [veh/h]	49	242	44	34	138	44	64	107	82	47	105	25
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.18	0.18	0.02	0.11	0.11	0.04	0.16	0.16	0.03	0.11	0.11
Intersection LOS	A											
Intersection V/C	0.588											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	10.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.823

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	101	43	38	45	106	89	1032	83	34	1618	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	5	0	8	47	0	0	0	0	28
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	51	101	43	43	45	114	136	1032	83	34	1618	118
Peak Hour Factor	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	27	12	12	12	31	37	279	22	9	437	32
Total Analysis Volume [veh/h]	55	109	46	46	49	123	147	1116	90	37	1749	128
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	50.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	29	0	0	29	0	0	61	0	0	61	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	15	15	67	67	67	67	67	67
g / C, Green / Cycle	0.16	0.16	0.75	0.75	0.75	0.75	0.75	0.75
(v / s)_i Volume / Saturation Flow Rate	0.14	0.14	0.61	0.22	0.23	0.08	0.35	0.35
s, saturation flow rate [veh/h]	1451	1531	243	3560	1799	463	3560	1806
c, Capacity [veh/h]	288	299	223	2661	1345	383	2661	1349
d1, Uniform Delay [s]	36.38	36.45	19.08	3.70	3.71	5.90	4.41	4.42
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.53	3.40	14.20	0.29	0.58	0.50	0.59	1.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.73	0.73	0.66	0.30	0.30	0.10	0.47	0.47
d, Delay for Lane Group [s/veh]	39.90	39.85	33.28	4.00	4.28	6.40	5.01	5.59
Lane Group LOS	D	D	C	A	A	A	A	A
Critical Lane Group	Yes	No	Yes	No	No	No	No	No
50th-Percentile Queue Length [veh/ln]	4.69	4.85	3.63	1.89	2.02	0.29	3.52	3.80
50th-Percentile Queue Length [ft/ln]	117.15	121.17	90.67	47.25	50.43	7.18	87.91	95.03
95th-Percentile Queue Length [veh/ln]	8.24	8.46	6.53	3.40	3.63	0.52	6.33	6.84
95th-Percentile Queue Length [ft/ln]	205.90	211.43	163.21	85.05	90.77	12.93	158.24	171.05

Movement, Approach, & Intersection Results

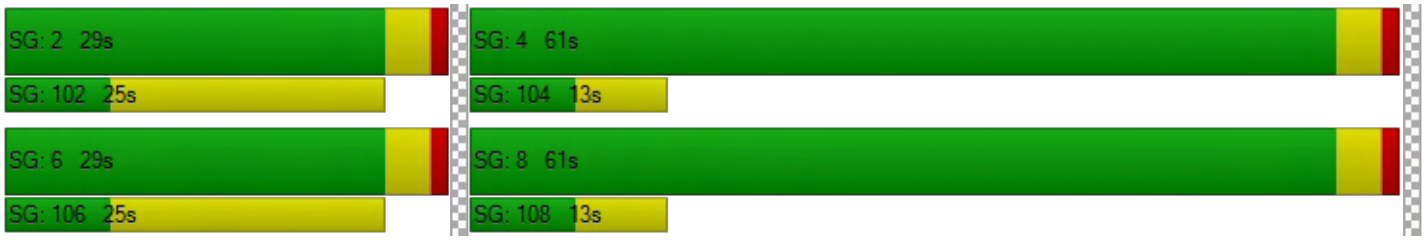
d_M, Delay for Movement [s/veh]	39.90	39.90	39.90	39.85	39.85	39.85	33.28	4.08	4.28	6.40	5.18	5.59
Movement LOS	D	D	D	D	D	D	C	A	A	A	A	A
d_A, Approach Delay [s/veh]	39.90			39.85			7.26			5.23		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	9.99											
Intersection LOS	A											
Intersection V/C	0.823											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	1.955	2.344	3.129	3.094
Crosswalk LOS	A	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	556	556	1267	1267
d_b, Bicycle Delay [s]	23.47	23.47	6.05	6.05
l_b,int, Bicycle LOS Score for Intersection	1.906	1.919	2.304	2.612
Bicycle LOS	A	A	B	B

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 13: Gaviota Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	12.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	16	4	16	18	1	12	3	115	12	15	97	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	11	0	0	53	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	4	16	18	1	12	3	126	12	15	150	5
Peak Hour Factor	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	1	5	6	0	4	1	39	4	5	46	2
Total Analysis Volume [veh/h]	20	5	20	22	1	15	4	156	15	19	185	6
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.01	0.02	0.04	0.00	0.02	0.00	0.00	0.00	0.01	0.00	0.00
d_M, Delay for Movement [s/veh]	12.06	12.18	9.47	12.14	12.19	9.56	7.59	0.00	0.00	7.57	0.00	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.22	0.22	0.22	0.19	0.19	0.19	0.01	0.01	0.01	0.03	0.03	0.03
95th-Percentile Queue Length [ft/ln]	5.54	5.54	5.54	4.84	4.84	4.84	0.16	0.16	0.16	0.80	0.80	0.80
d_A, Approach Delay [s/veh]	10.92			11.12			0.17			0.69		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	2.33											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.752

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	86	1069	170	281	1098	137	120	544	75	105	1052	358
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	1	0	19	0	0	0	0	5	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	86	1072	171	281	1117	137	120	544	75	110	1052	358
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	268	43	70	279	34	30	136	19	28	263	90
Total Analysis Volume [veh/h]	86	1072	171	281	1117	137	120	544	75	110	1052	358
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.26	0.26	0.09	0.26	0.26	0.08	0.13	0.13	0.07	0.22	0.22
Intersection LOS	C											
Intersection V/C	0.752											

Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.719

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	167	1031	161	149	765	147	177	836	85	231	1124	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	4	9	0	24	0	0	0	0	42	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	167	1035	170	149	789	147	177	836	85	273	1124	116
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	259	43	37	197	37	44	209	21	68	281	29
Total Analysis Volume [veh/h]	167	1035	170	149	789	147	177	836	85	273	1124	116
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.22	0.02	0.05	0.20	0.20	0.06	0.19	0.19	0.09	0.26	0.26
Intersection LOS	C											
Intersection V/C	0.719											

Intersection Level Of Service Report

Intersection 16: Cherry Ave (NS) at Burnett St/Skyline Dr (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.628

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	0	0	0	1
Pocket Length [ft]	193.00	100.00	96.00	200.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	94.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	34	1301	17	52	919	65	21	26	11	12	36	115
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	13	0	0	66	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	1314	17	52	985	65	21	26	11	12	36	115
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	329	4	13	246	16	5	7	3	3	9	29
Total Analysis Volume [veh/h]	34	1314	17	52	985	65	21	26	11	12	36	115
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.41	0.01	0.03	0.31	0.04	0.01	0.04	0.04	0.01	0.03	0.07
Intersection LOS	B											
Intersection V/C	0.628											

Intersection Level Of Service Report
Intersection 17: Cherry Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.598

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	0	0	0
Pocket Length [ft]	200.00	100.00	100.00	186.00	100.00	89.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	41	1200	4	11	844	88	112	1	55	6	3	23
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	2	0	0	13	53	11	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	41	1202	4	11	857	141	123	1	55	6	3	23
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	301	1	3	214	35	31	0	14	2	1	6
Total Analysis Volume [veh/h]	41	1202	4	11	857	141	123	1	55	6	3	23
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.38	0.00	0.01	0.27	0.09	0.08	0.11	0.11	0.00	0.02	0.02
Intersection LOS	A											
Intersection V/C	0.598											

Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.655

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	1035	10	62	763	88	79	47	62	11	77	150
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	13	2	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	1035	10	62	763	101	81	47	62	11	77	150
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	259	3	16	191	25	20	12	16	3	19	38
Total Analysis Volume [veh/h]	49	1035	10	62	763	101	81	47	62	11	77	150
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.32	0.01	0.04	0.24	0.06	0.05	0.08	0.04	0.01	0.14	0.14
Intersection LOS	B											
Intersection V/C	0.655											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.525

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	18	890	14	7	844	34	75	9	109	26	15	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	890	14	7	844	34	75	9	109	26	15	62
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	223	4	2	211	9	19	2	27	7	4	16
Total Analysis Volume [veh/h]	18	890	14	7	844	34	75	9	109	26	15	62
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.28	0.28	0.00	0.27	0.27	0.05	0.07	0.07	0.02	0.06	0.06
Intersection LOS	A											
Intersection V/C	0.525											

Intersection Level Of Service Report
Intersection 20: Cherry Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	28.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.788

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	118.00	135.00	100.00	100.00	180.00	100.00	100.00	186.00	100.00	100.00
Speed [mph]	30.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	78	565	22	129	432	256	190	919	65	34	1309	204
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	0	0	0	0	0	0	4	1	0	20	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	86	565	22	129	432	256	190	923	66	34	1329	204
Peak Hour Factor	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	150	6	34	115	68	50	245	18	9	353	54
Total Analysis Volume [veh/h]	91	600	23	137	459	272	202	980	70	36	1411	217
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	7.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	29	0	11	28	0	15	39	0	11	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	0	0	0	12	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	29	18	18	29	18	18	12	45	45	4	37	37
g / C, Green / Cycle	0.32	0.20	0.20	0.32	0.21	0.21	0.14	0.50	0.50	0.05	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.08	0.17	0.17	0.12	0.13	0.17	0.11	0.20	0.20	0.02	0.31	0.31
s, saturation flow rate [veh/h]	1179	1870	1846	1106	3560	1589	1781	3560	1807	1781	3560	1745
c, Capacity [veh/h]	385	371	366	343	731	326	241	1776	901	85	1464	718
d1, Uniform Delay [s]	22.66	34.79	34.80	24.01	32.70	34.36	38.03	14.07	14.08	41.75	22.55	22.56
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.31	5.28	5.37	0.75	0.89	5.57	7.58	0.65	1.28	3.35	3.50	6.98
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.24	0.84	0.84	0.40	0.63	0.83	0.84	0.39	0.39	0.42	0.75	0.75
d, Delay for Lane Group [s/veh]	22.97	40.07	40.17	24.77	33.59	39.94	45.60	14.73	15.36	45.10	26.05	29.54
Lane Group LOS	C	D	D	C	C	D	D	B	B	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.39	7.01	6.94	2.17	4.57	6.09	4.73	4.23	4.45	0.84	9.85	10.37
50th-Percentile Queue Length [ft/ln]	34.73	175.24	173.38	54.24	114.29	152.15	118.26	105.75	111.37	21.02	246.31	259.21
95th-Percentile Queue Length [veh/ln]	2.50	11.35	11.25	3.91	8.08	10.13	8.30	7.60	7.92	1.51	15.00	15.65
95th-Percentile Queue Length [ft/ln]	62.51	283.79	281.36	97.64	201.96	253.30	207.43	190.07	197.91	37.84	375.01	391.23

Movement, Approach, & Intersection Results

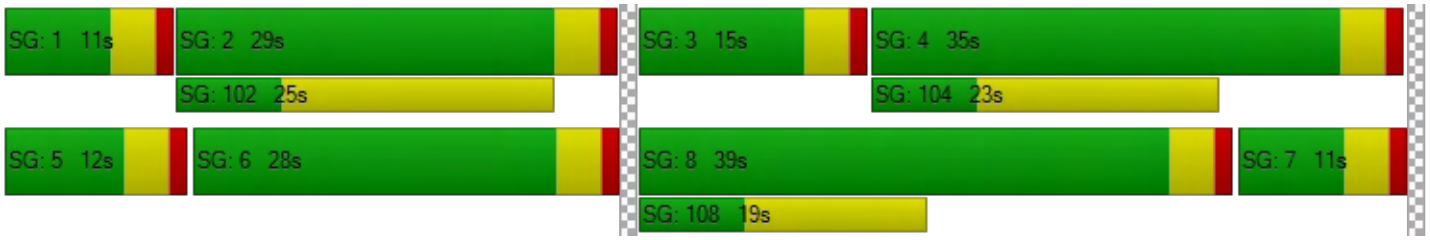
d_M, Delay for Movement [s/veh]	22.97	40.12	40.17	24.77	33.59	39.94	45.60	14.91	15.36	45.10	26.84	29.54
Movement LOS	C	D	D	C	C	D	D	B	B	D	C	C
d_A, Approach Delay [s/veh]	37.93			34.19			19.89			27.59		
Approach LOS	D			C			B			C		
d_I, Intersection Delay [s/veh]	28.36											
Intersection LOS	C											
Intersection V/C	0.788											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.549	2.759	0.000	3.092
Crosswalk LOS	B	C	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	556	533	778	689
d_b, Bicycle Delay [s]	23.47	24.20	16.81	19.34
l_b,int, Bicycle LOS Score for Intersection	2.149	2.276	2.248	2.475
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Signal Hill Business Park

Vistro File: G:\...\PM Base.vistro
Report File: G:\...\EP PM.pdf

Scenario 2 Existing Plus Project
7/3/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Orange Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Thru	0.818	-	D
2	Orange Ave (NS) at Willow St (EW)	Signalized	ICU 1	EB Thru	0.865	-	D
3	Orange Ave (NS) at Burnett St (EW)	Signalized	ICU 1	SB Thru	0.618	-	B
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	SB Right	0.634	-	B
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.641	21.5	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.082	11.7	B
7	Walnut Ave (NS) at Spring St (EW)	Signalized	ICU 1	EB Thru	0.660	-	B
8	Walnut Ave (NS) at Willow St (EW)	Signalized	ICU 1	EB Thru	0.652	-	B
9	Walnut Ave (NS) at Burnett St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.562	13.5	B
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.538	13.4	B
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	SB Right	0.521	-	A
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	SB Thru	0.610	10.9	B
13	Gaviota Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	SB Left	0.032	13.0	B
14	Cherry Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Thru	0.734	-	C
15	Cherry Ave (NS) at Willow St (EW)	Signalized	ICU 1	EB Thru	0.859	-	D
16	Cherry Ave (NS) at Burnett St/Skyline Dr (EW)	Signalized	ICU 1	SB Thru	0.624	-	B
17	Cherry Ave (NS) at Hill St (EW)	Signalized	ICU 1	SB Thru	0.656	-	B
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	SB Thru	0.601	-	B

19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	SB Thru	0.491	-	A
20	Cherry Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.677	25.3	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Orange Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.818

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	160.00	75.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	58	586	58	102	564	190	129	935	54	50	662	160
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	27	0	0	10	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	58	613	58	102	574	190	129	935	54	50	662	160
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	153	15	26	144	48	32	234	14	13	166	40
Total Analysis Volume [veh/h]	58	613	58	102	574	190	129	935	54	50	662	160
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.19	0.04	0.06	0.36	0.12	0.08	0.29	0.03	0.03	0.21	0.10
Intersection LOS	D											
Intersection V/C	0.818											

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.865

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	460	101	73	500	67	89	1451	74	135	1077	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	18	27	0	0	10	0	0	0	7	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	69	487	101	73	510	67	89	1451	81	135	1077	81
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	122	25	18	128	17	22	363	20	34	269	20
Total Analysis Volume [veh/h]	69	487	101	73	510	67	89	1451	81	135	1077	81
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.30	0.00	0.05	0.32	0.04	0.06	0.32	0.32	0.08	0.24	0.24
Intersection LOS	D											
Intersection V/C	0.865											

Intersection Level Of Service Report
Intersection 3: Orange Ave (NS) at Burnett St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.618

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	110.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	10	552	35	26	649	29	17	47	20	40	66	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	45	0	0	17	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	597	35	26	666	29	17	47	20	40	66	30
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	149	9	7	167	7	4	12	5	10	17	8
Total Analysis Volume [veh/h]	10	597	35	26	666	29	17	47	20	40	66	30
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.37	0.02	0.02	0.42	0.02	0.01	0.05	0.05	0.03	0.09	0.09
Intersection LOS	B											
Intersection V/C	0.618											

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.634

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	31	563	33	27	592	43	36	107	30	42	103	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	17	0	0	0	2	0	0	7	45
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	563	33	44	592	43	36	109	30	42	110	79
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	141	8	11	148	11	9	27	8	11	28	20
Total Analysis Volume [veh/h]	31	563	33	44	592	43	36	109	30	42	110	79
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.37	0.37	0.03	0.40	0.40	0.02	0.09	0.02	0.03	0.10	0.05
Intersection LOS	B											
Intersection V/C	0.634											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	21.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.641

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	73	495	277	80	499	97	84	1383	105	183	879	79
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	2	0	0	0	0	12	0	7	33	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	73	495	279	80	499	97	84	1395	105	190	912	79
Peak Hour Factor	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	127	71	20	128	25	22	357	27	49	234	20
Total Analysis Volume [veh/h]	75	507	286	82	511	99	86	1429	108	195	934	81
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	11	33	0	16	38	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	38	22	22	22	6	34	34	12	40	40
g / C, Green / Cycle	0.27	0.27	0.47	0.27	0.27	0.27	0.08	0.43	0.43	0.15	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.08	0.14	0.18	0.09	0.14	0.06	0.05	0.29	0.29	0.11	0.19	0.19
s, saturation flow rate [veh/h]	889	3560	1589	892	3560	1589	1781	3560	1803	1781	3560	1795
c, Capacity [veh/h]	202	977	753	204	977	436	135	1519	769	265	1780	897
d1, Uniform Delay [s]	33.39	24.58	13.54	33.58	24.61	22.48	35.94	18.45	18.45	32.56	12.35	12.36
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.13	0.43	0.32	1.28	0.44	0.26	4.92	2.38	4.64	3.93	0.62	1.22
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.37	0.52	0.38	0.40	0.52	0.23	0.64	0.67	0.67	0.73	0.38	0.38
d, Delay for Lane Group [s/veh]	34.52	25.00	13.85	34.86	25.04	22.74	40.87	20.83	23.10	36.50	12.97	13.58
Lane Group LOS	C	C	B	C	C	C	D	C	C	D	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.40	3.91	3.07	1.56	4.01	1.43	1.76	7.39	7.97	3.76	3.48	3.67
50th-Percentile Queue Length [ft/ln]	34.99	97.63	76.68	39.10	100.23	35.74	44.04	184.66	199.26	93.88	87.06	91.66
95th-Percentile Queue Length [veh/ln]	2.52	7.03	5.52	2.81	7.22	2.57	3.17	11.84	12.60	6.76	6.27	6.60
95th-Percentile Queue Length [ft/ln]	62.99	175.73	138.03	70.37	180.41	64.33	79.27	296.09	315.00	168.98	156.70	164.98

Movement, Approach, & Intersection Results

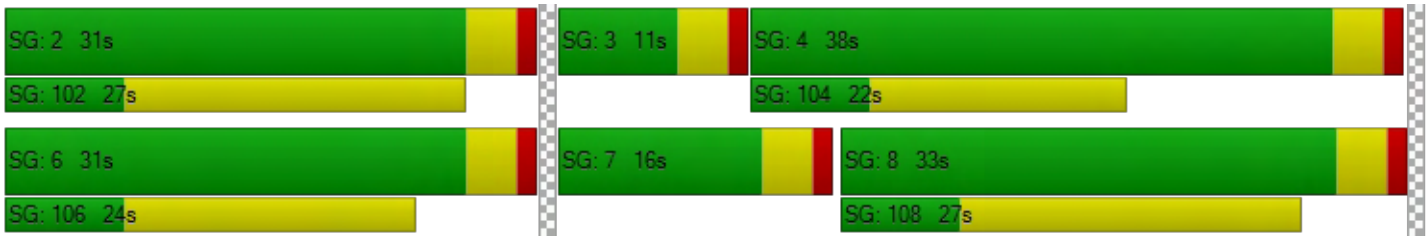
d_M, Delay for Movement [s/veh]	34.52	25.00	13.85	34.86	25.04	22.74	40.87	21.48	23.10	36.50	13.14	13.58
Movement LOS	C	C	B	C	C	C	D	C	C	D	B	B
d_A, Approach Delay [s/veh]	22.15			25.88			22.62			16.93		
Approach LOS	C			C			C			B		
d_I, Intersection Delay [s/veh]	21.47											
Intersection LOS	C											
Intersection V/C	0.641											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.765	2.668	3.138	3.193
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	675	675	725	850
d_b, Bicycle Delay [s]	17.56	17.56	16.26	13.23
l_b,int, Bicycle LOS Score for Intersection	2.276	2.131	2.452	2.225
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	11.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.082

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	4	6	146	4	4	179
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	37	0	6	13	0	16
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	41	6	152	17	4	195
Peak Hour Factor	0.8490	0.8490	0.8490	0.8490	0.8490	0.8490
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	2	45	5	1	57
Total Analysis Volume [veh/h]	48	7	179	20	5	230
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	11.75	9.78	0.00	0.00	7.61	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.30	0.30	0.00	0.00	0.01	0.01
95th-Percentile Queue Length [ft/ln]	7.41	7.41	0.00	0.00	0.22	0.22
d_A, Approach Delay [s/veh]	11.50		0.00		0.16	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	1.37					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 7: Walnut Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.660

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	102.00	100.00	100.00	98.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	106	214	137	42	109	29	73	1046	91	65	738	66
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	7	0	0	2	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	106	221	137	42	111	29	73	1046	91	65	738	66
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	55	34	11	28	7	18	262	23	16	185	17
Total Analysis Volume [veh/h]	106	221	137	42	111	29	73	1046	91	65	738	66
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.14	0.09	0.03	0.09	0.09	0.05	0.36	0.36	0.04	0.25	0.25
Intersection LOS	B											
Intersection V/C	0.660											

Intersection Level Of Service Report
Intersection 8: Walnut Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.652

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	106.00	100.00	100.00	100.00	100.00	100.00	204.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	61	179	183	80	152	51	49	1520	56	94	1168	60
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	7	0	0	2	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	61	186	183	80	154	51	49	1520	56	94	1168	60
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	47	46	20	39	13	12	380	14	24	292	15
Total Analysis Volume [veh/h]	61	186	183	80	154	51	49	1520	56	94	1168	60
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.12	0.12	0.05	0.05	0.03	0.03	0.33	0.33	0.06	0.26	0.26
Intersection LOS	B											
Intersection V/C	0.652											

Intersection Level Of Service Report
Intersection 9: Walnut Ave (NS) at Burnett St (EW)

Control Type:	All-way stop	Delay (sec / veh):	13.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.562

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	15	298	21	22	253	22	53	76	15	21	64	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	7	0	0	2	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	305	21	22	255	22	53	76	15	21	64	13
Peak Hour Factor	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	83	6	6	70	6	14	21	4	6	17	4
Total Analysis Volume [veh/h]	16	333	23	24	278	24	58	83	16	23	70	14
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	621	711	613	703	599	591
Degree of Utilization, x	0.56	0.03	0.49	0.03	0.26	0.18

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.49	0.10	2.72	0.11	1.05	0.66
95th-Percentile Queue Length [ft]	87.30	2.51	68.04	2.65	26.16	16.41
Approach Delay [s/veh]	15.20		13.68		11.14	10.44
Approach LOS	C		B		B	B
Intersection Delay [s/veh]	13.49					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	13.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.538

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	23	201	22	34	217	57	34	100	21	21	96	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	7	46	0	2	0	0	0	6	16	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	39	208	68	34	219	57	34	100	27	37	96	33
Peak Hour Factor	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	57	19	9	60	16	9	27	7	10	26	9
Total Analysis Volume [veh/h]	43	228	74	37	240	62	37	109	30	40	105	36
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	641	580	664	587	590
Degree of Utilization, x	0.54	0.48	0.09	0.30	0.31

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.21	2.57	0.31	1.25	1.30
95th-Percentile Queue Length [ft]	80.36	64.18	7.70	31.37	32.42
Approach Delay [s/veh]	14.96	13.39		11.74	11.79
Approach LOS	B	B		B	B
Intersection Delay [s/veh]	13.35				
Intersection LOS	B				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.521

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	26	199	44	28	193	31	47	83	29	39	37	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	0	0	65	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	222	44	28	258	31	47	83	29	39	37	21
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	56	11	7	65	8	12	21	7	10	9	5
Total Analysis Volume [veh/h]	26	222	44	28	258	31	47	83	29	39	37	21
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.17	0.17	0.02	0.18	0.18	0.03	0.10	0.10	0.02	0.06	0.06
Intersection LOS	A											
Intersection V/C	0.521											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	10.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.610

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	25	106	29	51	134	84	107	1682	54	58	1030	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	25	0	40	14	0	0	0	0	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	106	29	76	134	124	121	1682	54	58	1030	70
Peak Hour Factor	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	28	8	20	35	33	32	442	14	15	270	18
Total Analysis Volume [veh/h]	26	111	30	80	141	130	127	1767	57	61	1082	74
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	33.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	30	0	0	30	0	0	50	0	0	50	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	19	19	53	53	53	53	53	53
g / C, Green / Cycle	0.23	0.23	0.67	0.67	0.67	0.67	0.67	0.67
(v / s)_i Volume / Saturation Flow Rate	0.10	0.21	0.26	0.34	0.34	0.24	0.22	0.22
s, saturation flow rate [veh/h]	1688	1665	486	3560	1840	256	3560	1809
c, Capacity [veh/h]	446	444	353	2372	1226	208	2372	1206
d1, Uniform Delay [s]	25.83	29.44	11.44	6.71	6.71	15.31	5.66	5.66
k, delay calibration	0.11	0.13	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.52	3.77	2.85	0.78	1.50	3.56	0.36	0.71
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.37	0.79	0.36	0.51	0.51	0.29	0.32	0.32
d, Delay for Lane Group [s/veh]	26.35	33.21	14.28	7.48	8.22	18.87	6.02	6.38
Lane Group LOS	C	C	B	A	A	B	A	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.66	6.71	1.54	4.36	4.77	0.94	2.33	2.49
50th-Percentile Queue Length [ft/ln]	66.56	167.85	38.47	109.06	119.21	23.39	58.24	62.19
95th-Percentile Queue Length [veh/ln]	4.79	10.96	2.77	7.79	8.35	1.68	4.19	4.48
95th-Percentile Queue Length [ft/ln]	119.80	274.09	69.25	194.70	208.75	42.10	104.83	111.94

Movement, Approach, & Intersection Results

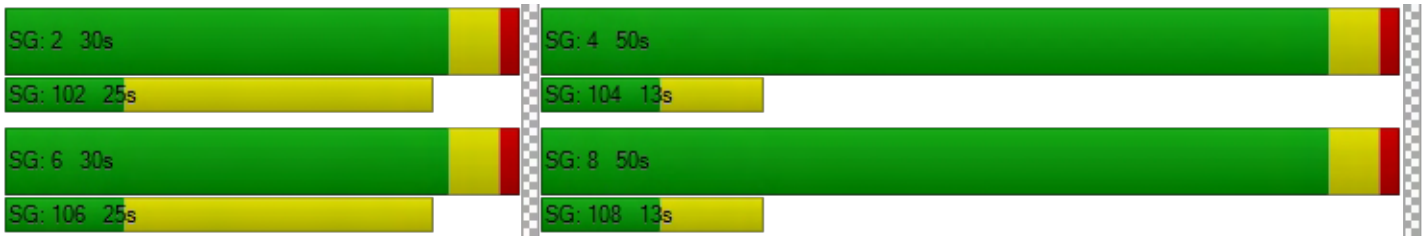
d_M, Delay for Movement [s/veh]	26.35	26.35	26.35	33.21	33.21	33.21	14.28	7.72	8.22	18.87	6.13	6.38
Movement LOS	C	C	C	C	C	C	B	A	A	B	A	A
d_A, Approach Delay [s/veh]	26.35			33.21			8.16			6.78		
Approach LOS	C			C			A			A		
d_I, Intersection Delay [s/veh]	10.91											
Intersection LOS	B											
Intersection V/C	0.610											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.003	2.330	3.068	3.132
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	650	650	1150	1150
d_b, Bicycle Delay [s]	18.23	18.23	7.23	7.23
l_b,int, Bicycle LOS Score for Intersection	1.835	2.139	2.633	2.229
Bicycle LOS	A	B	B	B

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 13: Gaviota Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	13.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.032

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	7	1	17	12	1	14	16	136	5	12	125	18
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	46	0	0	16	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	1	17	12	1	14	16	182	5	12	141	18
Peak Hour Factor	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	0	5	4	0	4	5	55	2	4	43	5
Total Analysis Volume [veh/h]	9	1	21	15	1	17	20	222	6	15	172	22
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.03	0.03	0.00	0.02	0.01	0.00	0.00	0.01	0.00	0.00
d_M, Delay for Movement [s/veh]	12.88	12.95	9.66	13.01	12.94	9.50	7.63	0.00	0.00	7.69	0.00	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.15	0.15	0.15	0.17	0.17	0.17	0.03	0.03	0.03	0.03	0.03	0.03
95th-Percentile Queue Length [ft/ln]	3.67	3.67	3.67	4.25	4.25	4.25	0.87	0.87	0.87	0.67	0.67	0.67
d_A, Approach Delay [s/veh]	10.70			11.20			0.61			0.55		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.86											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.734

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	1170	144	228	1250	109	155	916	128	93	656	368
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	17	5	0	5	0	0	0	0	2	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	98	1187	149	228	1255	109	155	916	128	95	656	368
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	297	37	57	314	27	39	229	32	24	164	92
Total Analysis Volume [veh/h]	98	1187	149	228	1255	109	155	916	128	95	656	368
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

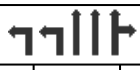
Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.28	0.28	0.07	0.28	0.28	0.10	0.22	0.22	0.06	0.16	0.16
Intersection LOS	C											
Intersection V/C	0.734											

Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.859

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	166	835	219	303	980	183	211	1292	132	318	990	175
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	22	36	0	7	0	0	0	0	13	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	166	857	255	303	987	183	211	1292	132	331	990	175
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	214	64	76	247	46	53	323	33	83	248	44
Total Analysis Volume [veh/h]	166	857	255	303	987	183	211	1292	132	331	990	175
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.18	0.06	0.09	0.24	0.24	0.07	0.30	0.30	0.10	0.24	0.24
Intersection LOS	D											
Intersection V/C	0.859											

Intersection Level Of Service Report

Intersection 16: Cherry Ave (NS) at Burnett St/Skyline Dr (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.624

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	0	0	0	1
Pocket Length [ft]	193.00	100.00	96.00	200.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	94.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	7	1064	31	132	1321	57	38	26	25	26	18	107
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	58	0	0	20	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	1122	31	132	1341	57	38	26	25	26	18	107
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	281	8	33	335	14	10	7	6	7	5	27
Total Analysis Volume [veh/h]	7	1122	31	132	1341	57	38	26	25	26	18	107
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.35	0.02	0.08	0.42	0.04	0.02	0.06	0.06	0.02	0.03	0.07
Intersection LOS	B											
Intersection V/C	0.624											

Intersection Level Of Service Report
Intersection 17: Cherry Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.656

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	0	0	0
Pocket Length [ft]	200.00	100.00	100.00	186.00	100.00	89.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	975	9	21	1214	135	112	2	66	5	2	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	12	0	0	4	16	46	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	987	9	21	1218	151	158	2	66	5	2	10
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	247	2	5	305	38	40	1	17	1	1	3
Total Analysis Volume [veh/h]	49	987	9	21	1218	151	158	2	66	5	2	10
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.31	0.01	0.01	0.38	0.09	0.10	0.14	0.14	0.00	0.01	0.01
Intersection LOS	B											
Intersection V/C	0.656											

Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.601

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	13	862	11	167	1071	44	55	35	13	7	16	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	4	12	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	862	11	167	1071	48	67	35	13	7	16	120
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	216	3	42	268	12	17	9	3	2	4	30
Total Analysis Volume [veh/h]	13	862	11	167	1071	48	67	35	13	7	16	120
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.27	0.01	0.10	0.33	0.03	0.04	0.06	0.01	0.00	0.09	0.09
Intersection LOS	B											
Intersection V/C	0.601											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.491

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	2	822	11	16	1054	16	21	6	24	15	6	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	822	11	16	1054	16	21	6	24	15	6	38
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	206	3	4	264	4	5	2	6	4	2	10
Total Analysis Volume [veh/h]	2	822	11	16	1054	16	21	6	24	15	6	38
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.26	0.26	0.01	0.33	0.33	0.01	0.02	0.02	0.01	0.04	0.04
Intersection LOS	A											
Intersection V/C	0.491											

Intersection Level Of Service Report
Intersection 20: Cherry Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	25.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.677

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	118.00	135.00	100.00	100.00	180.00	100.00	100.00	186.00	100.00	100.00
Speed [mph]	30.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	78	419	41	185	588	235	195	1413	78	72	891	170
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	0	0	0	0	0	0	18	7	0	7	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	80	419	41	185	588	235	195	1431	85	72	898	170
Peak Hour Factor	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	107	11	47	151	60	50	367	22	18	230	44
Total Analysis Volume [veh/h]	82	429	42	190	602	241	200	1466	87	74	920	174
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	79.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	29	0	11	29	0	13	29	0	11	27	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	0	0	0	12	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	16	16	27	17	17	11	35	35	6	30	30
g / C, Green / Cycle	0.34	0.20	0.20	0.34	0.21	0.21	0.14	0.44	0.44	0.07	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.07	0.13	0.13	0.16	0.17	0.15	0.11	0.29	0.29	0.04	0.21	0.21
s, saturation flow rate [veh/h]	1101	1870	1812	1210	3560	1589	1781	3560	1817	1781	3560	1722
c, Capacity [veh/h]	375	375	363	435	762	340	244	1566	799	128	1335	646
d1, Uniform Delay [s]	19.56	29.40	29.43	20.35	29.83	29.22	33.67	17.70	17.70	36.03	19.75	19.77
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.29	1.80	1.89	0.69	1.89	2.73	6.75	2.17	4.20	4.04	1.64	3.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.22	0.64	0.64	0.44	0.79	0.71	0.82	0.66	0.66	0.58	0.55	0.55
d, Delay for Lane Group [s/veh]	19.85	31.20	31.31	21.04	31.72	31.95	40.42	19.86	21.91	40.07	21.39	23.16
Lane Group LOS	B	C	C	C	C	C	D	B	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.05	4.27	4.17	2.61	5.49	4.41	4.09	7.21	7.82	1.50	5.31	5.47
50th-Percentile Queue Length [ft/ln]	26.23	106.68	104.26	65.13	137.36	110.24	102.15	180.20	195.49	37.48	132.66	136.66
95th-Percentile Queue Length [veh/ln]	1.89	7.66	7.51	4.69	9.34	7.85	7.35	11.61	12.41	2.70	9.08	9.30
95th-Percentile Queue Length [ft/ln]	47.22	191.38	187.67	117.23	233.46	196.34	183.87	290.27	310.15	67.46	227.11	232.52

Movement, Approach, & Intersection Results

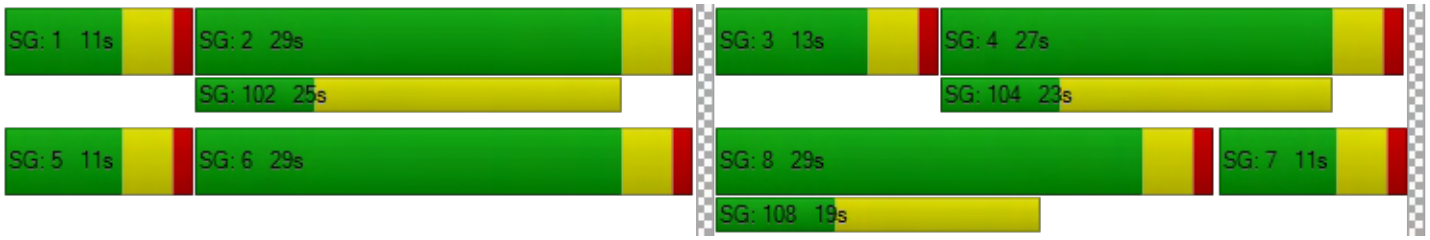
d_M, Delay for Movement [s/veh]	19.85	31.25	31.31	21.04	31.72	31.95	40.42	20.47	21.91	40.07	21.75	23.16
Movement LOS	B	C	C	C	C	C	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	29.57			29.81			22.82			23.12		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	25.33											
Intersection LOS	C											
Intersection V/C	0.677											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	0.00	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.550	2.745	0.000	3.114
Crosswalk LOS	B	B	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	625	625	625	575
d_b, Bicycle Delay [s]	18.91	18.91	18.91	20.31
l_b,int, Bicycle LOS Score for Intersection	2.016	2.412	2.524	2.202
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Opening Year Without Project

Signal Hill Business Park

Vistro File: G:\...\AM Base.vistro
Report File: G:\...\OY AM.pdf

Scenario 3 Opening Year Without Project
7/3/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Orange Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Thru	0.812	-	D
2	Orange Ave (NS) at Willow St (EW)	Signalized	ICU 1	NB Thru	0.764	-	C
3	Orange Ave (NS) at Burnett St (EW)	Signalized	ICU 1	NB Thru	0.668	-	B
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Right	0.736	-	C
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.637	24.0	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.075	12.9	B
7	Walnut Ave (NS) at Spring St (EW)	Signalized	ICU 1	WB Thru	0.633	-	B
8	Walnut Ave (NS) at Willow St (EW)	Signalized	ICU 1	WB Thru	0.520	-	A
9	Walnut Ave (NS) at Burnett St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.739	17.2	C
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.528	12.8	B
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	EB Thru	0.551	-	A
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	NB Thru	0.614	9.5	A
13	Gaviota Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Thru	0.009	11.6	B
14	Cherry Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Thru	0.768	-	C
15	Cherry Ave (NS) at Willow St (EW)	Signalized	ICU 1	WB Thru	0.732	-	C
16	Cherry Ave (NS) at Burnett St/Skyline Dr (EW)	Signalized	ICU 1	NB Thru	0.641	-	B
17	Cherry Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Thru	0.609	-	B
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	NB Thru	0.674	-	B

19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	NB Thru	0.541	-	A
20	Cherry Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.810	29.1	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Orange Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.812

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	160.00	75.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	28	579	57	99	518	130	88	610	65	107	942	141
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	16	8	19	11	0	0	8	0	4	2	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	29	607	66	120	539	133	90	630	66	113	963	149
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	152	17	30	135	33	23	158	17	28	241	37
Total Analysis Volume [veh/h]	29	607	66	120	539	133	90	630	66	113	963	149
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.19	0.04	0.08	0.34	0.08	0.06	0.20	0.04	0.07	0.30	0.09
Intersection LOS	D											
Intersection V/C	0.812											

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.764

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	82	492	92	40	439	83	84	931	72	69	1128	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	7	0	8	5	2	4	30	1	0	16	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	85	509	94	49	453	87	90	980	74	70	1167	76
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	127	24	12	113	22	23	245	19	18	292	19
Total Analysis Volume [veh/h]	85	509	94	49	453	87	90	980	74	70	1167	76
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.32	0.00	0.03	0.28	0.05	0.06	0.22	0.22	0.04	0.26	0.26
Intersection LOS	C											
Intersection V/C	0.764											

Intersection Level Of Service Report
Intersection 3: Orange Ave (NS) at Burnett St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.668

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	110.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	21	616	30	32	536	11	24	96	28	57	64	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	16	1	5	0	0	3	0	26	4	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	636	47	34	552	11	24	101	29	84	69	22
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	159	12	9	138	3	6	25	7	21	17	6
Total Analysis Volume [veh/h]	21	636	47	34	552	11	24	101	29	84	69	22
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.40	0.03	0.02	0.35	0.01	0.02	0.10	0.10	0.05	0.11	0.11
Intersection LOS	B											
Intersection V/C	0.668											

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.736

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	40	667	22	28	526	25	78	90	38	47	124	57
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	3	3	19	9	6	1	0	4	1	4
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	41	695	25	32	556	35	86	93	39	52	127	62
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	174	6	8	139	9	22	23	10	13	32	16
Total Analysis Volume [veh/h]	41	695	25	32	556	35	86	93	39	52	127	62
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.45	0.45	0.02	0.37	0.37	0.05	0.11	0.02	0.03	0.11	0.04
Intersection LOS	C											
Intersection V/C	0.736											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	24.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.637

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	511	198	53	345	101	104	864	67	239	1360	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	5	0	0	7	16	13	17	0	0	6	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	100	526	202	54	359	119	119	898	68	244	1393	103
Peak Hour Factor	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	147	56	15	100	33	33	251	19	68	389	29
Total Analysis Volume [veh/h]	112	588	226	60	401	133	133	1003	76	273	1556	115
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	14	34	0	25	45	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	24	24	44	24	24	24	8	38	38	16	46	46
g / C, Green / Cycle	0.27	0.27	0.49	0.27	0.27	0.27	0.09	0.42	0.42	0.18	0.51	0.51
(v / s)_i Volume / Saturation Flow Rate	0.11	0.17	0.14	0.07	0.11	0.08	0.07	0.20	0.20	0.15	0.31	0.31
s, saturation flow rate [veh/h]	984	3560	1589	828	3560	1589	1781	3560	1803	1781	3560	1805
c, Capacity [veh/h]	228	949	783	161	949	424	168	1490	755	323	1801	913
d1, Uniform Delay [s]	36.68	29.02	13.52	39.50	27.30	26.44	39.92	19.06	19.07	35.64	15.97	16.00
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.63	0.66	0.20	1.42	0.30	0.42	8.04	1.11	2.19	6.00	1.58	3.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.49	0.62	0.29	0.37	0.42	0.31	0.79	0.48	0.48	0.84	0.62	0.62
d, Delay for Lane Group [s/veh]	38.31	29.68	13.72	40.92	27.60	26.86	47.96	20.17	21.25	41.64	17.56	19.13
Lane Group LOS	D	C	B	D	C	C	D	C	C	D	B	B
Critical Lane Group	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.39	5.44	2.56	1.33	3.53	2.29	3.19	5.36	5.66	6.14	7.84	8.38
50th-Percentile Queue Length [ft/ln]	59.83	136.09	64.12	33.37	88.18	57.24	79.68	133.97	141.53	153.51	195.94	209.50
95th-Percentile Queue Length [veh/ln]	4.31	9.27	4.62	2.40	6.35	4.12	5.74	9.16	9.56	10.20	12.43	13.13
95th-Percentile Queue Length [ft/ln]	107.69	231.75	115.41	60.07	158.72	103.04	143.42	228.88	239.08	255.11	310.73	328.19

Movement, Approach, & Intersection Results

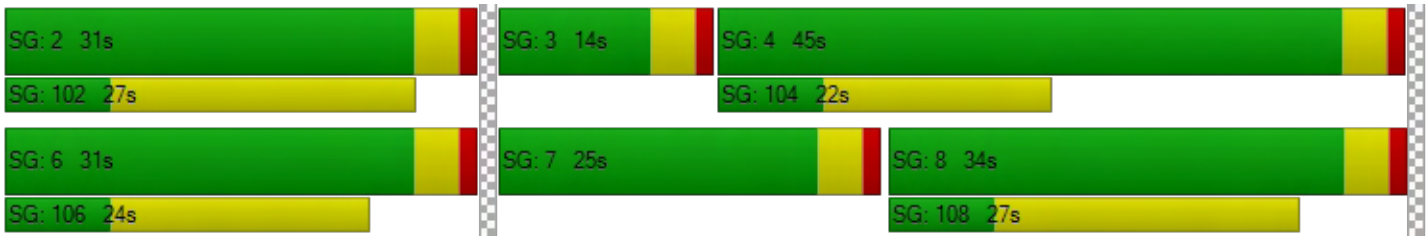
d_M, Delay for Movement [s/veh]	38.31	29.68	13.72	40.92	27.60	26.86	47.96	20.48	21.25	41.64	18.01	19.13
Movement LOS	D	C	B	D	C	C	D	C	C	D	B	B
d_A, Approach Delay [s/veh]	26.83			28.78			23.55			21.39		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	23.97											
Intersection LOS	C											
Intersection V/C	0.637											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.770	2.685	3.242	3.204
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	600	600	667	911
d_b, Bicycle Delay [s]	22.05	22.05	20.00	13.34
l_b,int, Bicycle LOS Score for Intersection	2.324	2.050	2.226	2.629
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	12.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.075

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	16	6	120	5	5	228
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	9	0	0	7	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	6	122	12	5	233
Peak Hour Factor	0.6710	0.6710	0.6710	0.6710	0.6710	0.6710
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	2	45	4	2	87
Total Analysis Volume [veh/h]	37	9	182	18	7	347
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.01	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	12.89	9.83	0.00	0.00	7.61	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.28	0.28	0.00	0.00	0.01	0.01
95th-Percentile Queue Length [ft/ln]	6.96	6.96	0.00	0.00	0.27	0.27
d_A, Approach Delay [s/veh]	12.29		0.00		0.15	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	1.03					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 7: Walnut Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.633

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	102.00	100.00	100.00	98.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	90	102	62	29	119	46	31	635	55	102	1052	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	2	0	0	1	0	0	9	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	92	106	63	30	122	47	32	657	56	104	1076	44
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	27	16	8	31	12	8	164	14	26	269	11
Total Analysis Volume [veh/h]	92	106	63	30	122	47	32	657	56	104	1076	44
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.07	0.04	0.02	0.11	0.11	0.02	0.22	0.22	0.07	0.35	0.35
Intersection LOS	B											
Intersection V/C	0.633											

Intersection Level Of Service Report
Intersection 8: Walnut Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.520

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	106.00	100.00	100.00	100.00	100.00	100.00	204.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	158	160	39	106	32	32	982	41	50	1199	69
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	22	2	5	0	1	0	0	24	14	3	7	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	74	163	168	40	109	33	33	1026	56	54	1230	70
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	41	42	10	27	8	8	257	14	14	308	18
Total Analysis Volume [veh/h]	74	163	168	40	109	33	33	1026	56	54	1230	70
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.10	0.10	0.03	0.03	0.02	0.02	0.23	0.23	0.03	0.27	0.27
Intersection LOS	A											
Intersection V/C	0.520											

Intersection Level Of Service Report
Intersection 9: Walnut Ave (NS) at Burnett St (EW)

Control Type:	All-way stop	Delay (sec / veh):	17.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.739

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	44	281	25	10	140	40	37	43	60	41	84	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	2	3	1	2	4	1	18	1	4	26	1
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	45	289	29	11	145	45	39	62	62	46	112	17
Peak Hour Factor	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	90	9	3	45	14	12	19	19	14	35	5
Total Analysis Volume [veh/h]	56	359	36	14	180	56	48	77	77	57	139	21
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	562	640	534	601	571	560
Degree of Utilization, x	0.74	0.06	0.36	0.09	0.35	0.39

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	6.31	0.18	1.65	0.31	1.59	1.82
95th-Percentile Queue Length [ft]	157.73	4.46	41.17	7.67	39.70	45.51
Approach Delay [s/veh]	23.74		12.35		12.72	13.44
Approach LOS	C		B		B	B
Intersection Delay [s/veh]	17.21					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	12.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.528

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	22	207	8	48	131	137	21	77	26	23	70	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	5	6	0	5	0	0	0	0	3	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	216	14	49	139	140	21	79	27	26	71	36
Peak Hour Factor	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	71	5	16	46	46	7	26	9	9	23	12
Total Analysis Volume [veh/h]	29	285	18	65	183	184	28	104	36	34	94	47
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	628	579	670	583	587
Degree of Utilization, x	0.53	0.43	0.27	0.29	0.30

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.10	2.14	1.12	1.19	1.25
95th-Percentile Queue Length [ft]	77.54	53.44	27.89	29.71	31.13
Approach Delay [s/veh]	14.97	12.05		11.66	11.72
Approach LOS	B	B		B	B
Intersection Delay [s/veh]	12.81				
Intersection LOS	B				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.551

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	167	44	34	125	44	64	107	82	47	105	25
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	0	9	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	176	45	35	137	45	65	109	84	48	107	26
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	44	11	9	34	11	16	27	21	12	27	7
Total Analysis Volume [veh/h]	50	176	45	35	137	45	65	109	84	48	107	26
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.14	0.14	0.02	0.11	0.11	0.04	0.16	0.16	0.03	0.11	0.11
Intersection LOS	A											
Intersection V/C	0.551											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	9.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.614

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	101	43	38	45	106	89	1032	83	34	1618	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	4	0	3	6	0	0	17	0	0	6	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	107	44	42	52	108	91	1070	85	35	1656	94
Peak Hour Factor	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	29	12	11	14	29	25	289	23	9	448	25
Total Analysis Volume [veh/h]	56	116	48	45	56	117	98	1157	92	38	1790	102
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	49.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	29	0	0	29	0	0	61	0	0	61	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	15	15	67	67	67	67	67	67
g / C, Green / Cycle	0.17	0.17	0.74	0.74	0.74	0.74	0.74	0.74
(v / s)_i Volume / Saturation Flow Rate	0.15	0.14	0.41	0.23	0.23	0.09	0.35	0.35
s, saturation flow rate [veh/h]	1472	1531	239	3560	1800	445	3560	1819
c, Capacity [veh/h]	300	308	219	2639	1335	366	2639	1348
d1, Uniform Delay [s]	36.09	35.89	13.40	3.92	3.92	6.31	4.64	4.65
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.46	2.98	6.49	0.31	0.62	0.57	0.61	1.20
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.73	0.71	0.45	0.31	0.31	0.10	0.47	0.48
d, Delay for Lane Group [s/veh]	39.55	38.87	19.89	4.24	4.54	6.88	5.25	5.85
Lane Group LOS	D	D	B	A	A	A	A	A
Critical Lane Group	Yes	No	Yes	No	No	No	No	No
50th-Percentile Queue Length [veh/ln]	4.89	4.78	1.66	2.06	2.20	0.31	3.69	4.01
50th-Percentile Queue Length [ft/ln]	122.37	119.47	41.45	51.47	54.90	7.76	92.32	100.25
95th-Percentile Queue Length [veh/ln]	8.52	8.36	2.98	3.71	3.95	0.56	6.65	7.22
95th-Percentile Queue Length [ft/ln]	213.08	209.10	74.61	92.65	98.81	13.97	166.18	180.44

Movement, Approach, & Intersection Results

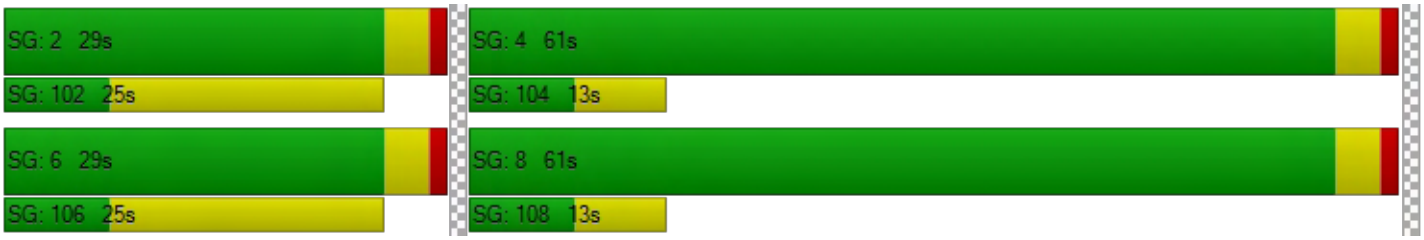
d_M, Delay for Movement [s/veh]	39.55	39.55	39.55	38.87	38.87	38.87	19.89	4.32	4.54	6.88	5.43	5.85
Movement LOS	D	D	D	D	D	D	B	A	A	A	A	A
d_A, Approach Delay [s/veh]	39.55			38.87			5.47			5.48		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	9.46											
Intersection LOS	A											
Intersection V/C	0.614											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	1.966	2.253	3.134	3.100
Crosswalk LOS	A	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	556	556	1267	1267
d_b, Bicycle Delay [s]	23.47	23.47	6.05	6.05
l_b,int, Bicycle LOS Score for Intersection	1.923	1.919	2.300	2.621
Bicycle LOS	A	A	B	B

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 13: Gaviota Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	11.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.009

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	16	4	16	18	1	12	3	115	12	15	97	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	6	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	4	16	18	1	12	3	123	12	15	102	5
Peak Hour Factor	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	1	5	6	0	4	1	38	4	5	32	2
Total Analysis Volume [veh/h]	20	5	20	22	1	15	4	152	15	19	126	6
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.01	0.02	0.04	0.00	0.02	0.00	0.00	0.00	0.01	0.00	0.00
d_M, Delay for Movement [s/veh]	11.39	11.60	9.40	11.46	11.59	9.20	7.46	0.00	0.00	7.56	0.00	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.21	0.21	0.21	0.18	0.18	0.18	0.01	0.01	0.01	0.03	0.03	0.03
95th-Percentile Queue Length [ft/ln]	5.17	5.17	5.17	4.40	4.40	4.40	0.15	0.15	0.15	0.80	0.80	0.80
d_A, Approach Delay [s/veh]	10.53			10.57			0.17			0.95		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	2.59											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.768

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	86	1069	170	281	1098	137	120	544	75	105	1052	358
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	18	0	0	27	0	0	1	8	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	90	1108	173	287	1147	140	122	556	85	107	1074	365
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	277	43	72	287	35	31	139	21	27	269	91
Total Analysis Volume [veh/h]	90	1108	173	287	1147	140	122	556	85	107	1074	365
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

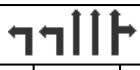
Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.27	0.27	0.09	0.27	0.27	0.08	0.13	0.13	0.07	0.22	0.22
Intersection LOS	C											
Intersection V/C	0.768											

Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.732

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	167	1031	161	149	765	147	177	836	85	231	1124	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	11	15	28	7	0	1	28	0	9	10	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	170	1063	179	180	787	150	182	881	87	245	1156	126
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	43	266	45	45	197	38	46	220	22	61	289	32
Total Analysis Volume [veh/h]	170	1063	179	180	787	150	182	881	87	245	1156	126
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.22	0.04	0.06	0.20	0.20	0.06	0.20	0.20	0.08	0.27	0.27
Intersection LOS	C											
Intersection V/C	0.732											

Intersection Level Of Service Report

Intersection 16: Cherry Ave (NS) at Burnett St/Skyline Dr (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.641

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	0	0	0	1
Pocket Length [ft]	193.00	100.00	96.00	200.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	94.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	34	1301	17	52	919	65	21	26	11	12	36	115
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	23	0	0	25	0	0	0	1	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	36	1350	17	53	962	66	21	27	12	12	37	117
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	338	4	13	241	17	5	7	3	3	9	29
Total Analysis Volume [veh/h]	36	1350	17	53	962	66	21	27	12	12	37	117
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.42	0.01	0.03	0.30	0.04	0.01	0.04	0.04	0.01	0.03	0.07
Intersection LOS	B											
Intersection V/C	0.641											

Intersection Level Of Service Report
Intersection 17: Cherry Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.609

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	0	0	0
Pocket Length [ft]	200.00	100.00	100.00	186.00	100.00	89.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	41	1200	4	11	844	88	112	1	55	6	3	23
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	18	0	0	23	3	6	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	42	1242	4	11	884	93	120	1	56	6	3	23
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	311	1	3	221	23	30	0	14	2	1	6
Total Analysis Volume [veh/h]	42	1242	4	11	884	93	120	1	56	6	3	23
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.39	0.00	0.01	0.28	0.06	0.08	0.11	0.11	0.00	0.02	0.02
Intersection LOS	B											
Intersection V/C	0.609											

Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.674

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	1035	10	62	763	88	79	47	62	11	77	150
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	0	4	19	0	0	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	1071	10	67	797	90	81	48	63	11	79	156
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	268	3	17	199	23	20	12	16	3	20	39
Total Analysis Volume [veh/h]	50	1071	10	67	797	90	81	48	63	11	79	156
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.33	0.01	0.04	0.25	0.06	0.05	0.08	0.04	0.01	0.15	0.15
Intersection LOS	B											
Intersection V/C	0.674											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.541

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	18	890	14	7	844	34	75	9	109	26	15	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	12	0	4	15	0	0	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	920	14	11	876	35	77	9	111	27	15	66
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	230	4	3	219	9	19	2	28	7	4	17
Total Analysis Volume [veh/h]	18	920	14	11	876	35	77	9	111	27	15	66
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.29	0.29	0.01	0.28	0.28	0.05	0.08	0.08	0.02	0.07	0.07
Intersection LOS	A											
Intersection V/C	0.541											

Intersection Level Of Service Report
Intersection 20: Cherry Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	29.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.810

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	118.00	135.00	100.00	100.00	180.00	100.00	100.00	186.00	100.00	100.00
Speed [mph]	30.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	78	565	22	129	432	256	190	919	65	34	1309	204
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	0	11	4	0	0	20	0	0	8	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	80	579	22	143	445	261	194	957	66	35	1343	217
Peak Hour Factor	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	154	6	38	118	69	51	254	18	9	356	58
Total Analysis Volume [veh/h]	85	615	23	152	472	277	206	1016	70	37	1426	230
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	7.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	29	0	12	30	0	15	38	0	11	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	0	0	0	12	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	30	18	18	30	20	20	12	44	44	4	36	36
g / C, Green / Cycle	0.33	0.20	0.20	0.33	0.22	0.22	0.14	0.49	0.49	0.05	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.07	0.17	0.17	0.14	0.13	0.17	0.12	0.20	0.20	0.02	0.31	0.31
s, saturation flow rate [veh/h]	1160	1870	1846	1109	3560	1589	1781	3560	1809	1781	3560	1740
c, Capacity [veh/h]	391	378	374	354	773	345	245	1736	882	86	1418	693
d1, Uniform Delay [s]	21.92	34.63	34.63	23.62	31.87	33.48	37.92	14.84	14.84	41.70	23.73	23.75
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.28	5.31	5.40	0.82	0.79	4.38	7.58	0.73	1.44	3.36	4.40	8.71
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.22	0.85	0.85	0.43	0.61	0.80	0.84	0.41	0.41	0.43	0.78	0.79
d, Delay for Lane Group [s/veh]	22.20	39.94	40.03	24.45	32.65	37.85	45.51	15.57	16.28	45.06	28.14	32.46
Lane Group LOS	C	D	D	C	C	D	D	B	B	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.27	7.17	7.10	2.39	4.63	6.03	4.82	4.55	4.79	0.86	10.50	11.12
50th-Percentile Queue Length [ft/ln]	31.71	179.36	177.49	59.67	115.80	150.67	120.51	113.65	119.87	21.58	262.60	278.04
95th-Percentile Queue Length [veh/ln]	2.28	11.57	11.47	4.30	8.16	10.05	8.42	8.04	8.39	1.55	15.82	16.59
95th-Percentile Queue Length [ft/ln]	57.08	289.18	286.73	107.40	204.04	251.32	210.53	201.06	209.64	38.85	395.48	414.77

Movement, Approach, & Intersection Results

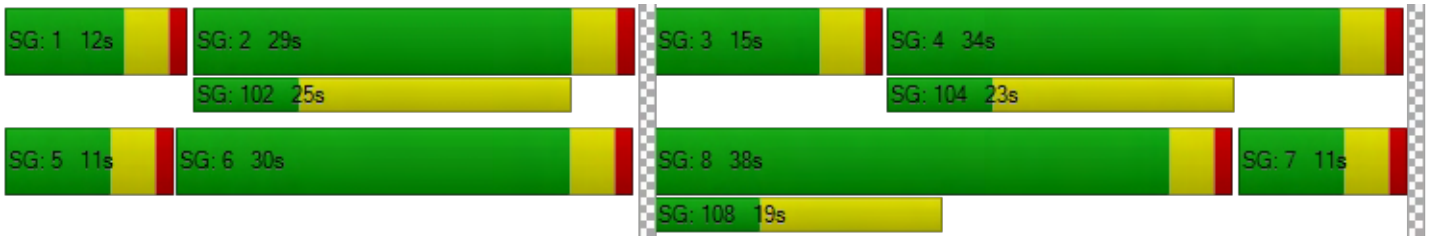
d_M, Delay for Movement [s/veh]	22.20	39.98	40.03	24.45	32.65	37.85	45.51	15.78	16.28	45.06	29.09	32.46
Movement LOS	C	D	D	C	C	D	D	B	B	D	C	C
d_A, Approach Delay [s/veh]	37.89			32.87			20.55			29.90		
Approach LOS	D			C			C			C		
d_I, Intersection Delay [s/veh]	29.11											
Intersection LOS	C											
Intersection V/C	0.810											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.553	2.770	0.000	3.111
Crosswalk LOS	B	C	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	556	578	756	667
d_b, Bicycle Delay [s]	23.47	22.76	17.42	20.00
l_b,int, Bicycle LOS Score for Intersection	2.156	2.303	2.270	2.491
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Signal Hill Business Park

Vistro File: G:\...\PM Base.vistro
Report File: G:\...\OY PM.pdf

Scenario 3 Opening Year Without Project
7/3/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Orange Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Thru	0.845	-	D
2	Orange Ave (NS) at Willow St (EW)	Signalized	ICU 1	EB Thru	0.871	-	D
3	Orange Ave (NS) at Burnett St (EW)	Signalized	ICU 1	SB Thru	0.635	-	B
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	SB Right	0.666	-	B
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.648	22.0	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.022	11.2	B
7	Walnut Ave (NS) at Spring St (EW)	Signalized	ICU 1	EB Thru	0.669	-	B
8	Walnut Ave (NS) at Willow St (EW)	Signalized	ICU 1	EB Thru	0.675	-	B
9	Walnut Ave (NS) at Burnett St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.600	14.8	B
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	SB Thru	0.475	12.3	B
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	NB Thru	0.505	-	A
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	SB Thru	0.578	9.5	A
13	Gaviota Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Thru	0.002	12.3	B
14	Cherry Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Thru	0.744	-	C
15	Cherry Ave (NS) at Willow St (EW)	Signalized	ICU 1	EB Right	0.879	-	D
16	Cherry Ave (NS) at Burnett St/Skyline Dr (EW)	Signalized	ICU 1	SB Thru	0.625	-	B
17	Cherry Ave (NS) at Hill St (EW)	Signalized	ICU 1	SB Thru	0.642	-	B
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	SB Thru	0.615	-	B

19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	SB Thru	0.505	-	A
20	Cherry Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.692	25.7	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Orange Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.845

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	160.00	75.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	58	586	58	102	564	190	129	935	54	50	662	160
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	12	6	13	18	0	0	4	0	10	8	20
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	59	610	65	117	593	194	132	958	55	61	683	183
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	153	16	29	148	49	33	240	14	15	171	46
Total Analysis Volume [veh/h]	59	610	65	117	593	194	132	958	55	61	683	183
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.19	0.04	0.07	0.37	0.12	0.08	0.30	0.03	0.04	0.21	0.11
Intersection LOS	D											
Intersection V/C	0.845											

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.871

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	460	101	73	500	67	89	1451	74	135	1077	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	7	0	16	7	5	3	22	1	0	29	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	53	476	103	90	517	73	94	1502	76	138	1128	91
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	119	26	23	129	18	24	376	19	35	282	23
Total Analysis Volume [veh/h]	53	476	103	90	517	73	94	1502	76	138	1128	91
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.30	0.00	0.06	0.32	0.05	0.06	0.33	0.33	0.09	0.25	0.25
Intersection LOS	D											
Intersection V/C	0.871											

Intersection Level Of Service Report
Intersection 3: Orange Ave (NS) at Burnett St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.635

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	110.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	10	552	35	26	649	29	17	47	20	40	66	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	31	0	8	0	0	5	0	15	3	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	569	67	27	670	30	17	53	20	56	70	33
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	142	17	7	168	8	4	13	5	14	18	8
Total Analysis Volume [veh/h]	10	569	67	27	670	30	17	53	20	56	70	33
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.36	0.04	0.02	0.42	0.02	0.01	0.06	0.06	0.04	0.10	0.10
Intersection LOS	B											
Intersection V/C	0.635											

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.666

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	31	563	33	27	592	43	36	107	30	42	103	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	3	16	5	11	1	0	3	1	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	597	37	31	620	49	48	110	31	46	106	38
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	149	9	8	155	12	12	28	8	12	27	10
Total Analysis Volume [veh/h]	32	597	37	31	620	49	48	110	31	46	106	38
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.40	0.40	0.02	0.42	0.42	0.03	0.10	0.02	0.03	0.10	0.02
Intersection LOS	B											
Intersection V/C	0.666											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	22.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.648

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	73	495	277	80	499	97	84	1383	105	183	879	79
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	0	0	6	13	18	10	0	0	17	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	74	513	283	82	515	112	104	1421	107	187	914	81
Peak Hour Factor	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	131	72	21	132	29	27	364	27	48	234	21
Total Analysis Volume [veh/h]	76	526	290	84	528	115	107	1456	110	192	936	83
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	12	34	0	15	37	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	23	23	38	23	23	23	6	34	34	12	39	39
g / C, Green / Cycle	0.28	0.28	0.48	0.28	0.28	0.28	0.08	0.42	0.42	0.15	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.09	0.15	0.18	0.10	0.15	0.07	0.06	0.29	0.29	0.11	0.19	0.19
s, saturation flow rate [veh/h]	875	3560	1589	877	3560	1589	1781	3560	1804	1781	3560	1793
c, Capacity [veh/h]	204	1002	762	204	1002	447	145	1498	759	264	1735	874
d1, Uniform Delay [s]	33.23	24.29	13.28	33.51	24.31	22.32	35.97	19.00	19.01	32.59	13.01	13.01
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.13	0.43	0.31	1.32	0.43	0.30	7.04	2.67	5.20	3.80	0.66	1.32
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.37	0.53	0.38	0.41	0.53	0.26	0.74	0.69	0.69	0.73	0.39	0.39
d, Delay for Lane Group [s/veh]	34.36	24.72	13.59	34.84	24.74	22.62	43.01	21.68	24.21	36.39	13.67	14.33
Lane Group LOS	C	C	B	C	C	C	D	C	C	D	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.42	4.03	3.07	1.60	4.12	1.66	2.26	7.73	8.37	3.69	3.63	3.82
50th-Percentile Queue Length [ft/ln]	35.38	100.72	76.78	40.07	102.93	41.50	56.47	193.23	209.25	92.27	90.66	95.41
95th-Percentile Queue Length [veh/ln]	2.55	7.25	5.53	2.89	7.41	2.99	4.07	12.29	13.11	6.64	6.53	6.87
95th-Percentile Queue Length [ft/ln]	63.68	181.29	138.20	72.13	185.27	74.70	101.65	307.22	327.87	166.09	163.19	171.73

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.36	24.72	13.59	34.84	24.74	22.62	43.01	22.40	24.21	36.39	13.86	14.33
Movement LOS	C	C	B	C	C	C	D	C	C	D	B	B
d_A, Approach Delay [s/veh]	21.92			25.57			23.84			17.46		
Approach LOS	C			C			C			B		
d_I, Intersection Delay [s/veh]	22.02											
Intersection LOS	C											
Intersection V/C	0.648											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.773	2.681	3.150	3.201
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	675	675	750	825
d_b, Bicycle Delay [s]	17.56	17.56	15.63	13.81
l_b,int, Bicycle LOS Score for Intersection	2.296	2.159	2.480	2.226
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	11.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.022

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	4	6	146	4	4	179
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	7	0	0	7	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	6	149	11	4	183
Peak Hour Factor	0.8490	0.8490	0.8490	0.8490	0.8490	0.8490
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	2	44	3	1	54
Total Analysis Volume [veh/h]	13	7	176	13	5	216
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	11.16	9.33	0.00	0.00	7.59	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.09	0.09	0.00	0.00	0.01	0.01
95th-Percentile Queue Length [ft/ln]	2.30	2.30	0.00	0.00	0.22	0.22
d_A, Approach Delay [s/veh]	10.52		0.00		0.17	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.58					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 7: Walnut Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.669

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	102.00	100.00	100.00	98.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	106	214	137	42	109	29	73	1046	91	65	738	66
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	1	0	0	6	0	0	9	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	108	219	140	43	112	30	74	1073	93	66	762	67
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	55	35	11	28	8	19	268	23	17	191	17
Total Analysis Volume [veh/h]	108	219	140	43	112	30	74	1073	93	66	762	67
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.14	0.09	0.03	0.09	0.09	0.05	0.36	0.36	0.04	0.26	0.26
Intersection LOS	B											
Intersection V/C	0.669											

Intersection Level Of Service Report
Intersection 8: Walnut Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.675

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	106.00	100.00	100.00	100.00	100.00	100.00	204.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	61	179	183	80	152	51	49	1520	56	94	1168	60
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	13	1	4	0	1	0	0	11	27	6	24	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	75	184	191	82	156	52	50	1561	84	102	1215	61
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	46	48	21	39	13	13	390	21	26	304	15
Total Analysis Volume [veh/h]	75	184	191	82	156	52	50	1561	84	102	1215	61
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.12	0.12	0.05	0.05	0.03	0.03	0.34	0.34	0.06	0.27	0.27
Intersection LOS	B											
Intersection V/C	0.675											

Intersection Level Of Service Report
Intersection 9: Walnut Ave (NS) at Burnett St (EW)

Control Type:	All-way stop	Delay (sec / veh):	14.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.600

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	15	298	21	22	253	22	53	76	15	21	64	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	2	5	1	1	2	4	32	0	3	16	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	17	306	26	23	259	24	58	110	15	24	81	15
Peak Hour Factor	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	83	7	6	71	7	16	30	4	7	22	4
Total Analysis Volume [veh/h]	19	334	28	25	282	26	63	120	16	26	88	16
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	589	669	581	661	580	566
Degree of Utilization, x	0.60	0.04	0.53	0.04	0.34	0.23

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.96	0.13	3.09	0.12	1.52	0.88
95th-Percentile Queue Length [ft]	99.08	3.27	77.16	3.07	38.04	21.99
Approach Delay [s/veh]	16.88		15.07		12.43	11.24
Approach LOS	C		C		B	B
Intersection Delay [s/veh]	14.75					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	12.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.475

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	23	201	22	34	217	57	34	100	21	21	96	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	2	0	4	0	0	0	0	3	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	23	211	24	35	225	58	35	102	21	24	98	34
Peak Hour Factor	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	58	7	10	62	16	10	28	6	7	27	9
Total Analysis Volume [veh/h]	25	231	26	38	246	63	38	112	23	26	107	37
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	644	598	687	607	613
Degree of Utilization, x	0.44	0.47	0.09	0.28	0.28

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.23	2.55	0.30	1.17	1.13
95th-Percentile Queue Length [ft]	55.64	63.65	7.54	29.26	28.23
Approach Delay [s/veh]	12.86	13.02		11.28	11.12
Approach LOS	B	B		B	B
Intersection Delay [s/veh]	12.33				
Intersection LOS	B				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.505

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	26	199	44	28	193	31	47	83	29	39	37	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	0	0	6	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	211	45	29	203	32	48	85	30	40	38	21
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	53	11	7	51	8	12	21	8	10	10	5
Total Analysis Volume [veh/h]	27	211	45	29	203	32	48	85	30	40	38	21
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.16	0.16	0.02	0.15	0.15	0.03	0.10	0.10	0.03	0.06	0.06
Intersection LOS	A											
Intersection V/C	0.505											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	9.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.578

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	25	106	29	51	134	84	107	1682	54	58	1030	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	2	4	0	0	10	0	0	17	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	114	30	54	141	86	109	1726	55	59	1068	64
Peak Hour Factor	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	30	8	14	37	23	29	453	14	15	280	17
Total Analysis Volume [veh/h]	27	120	32	57	148	90	114	1813	58	62	1122	67
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	32.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	29	0	0	29	0	0	51	0	0	51	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	16	16	56	56	56	56	56	56
g / C, Green / Cycle	0.20	0.20	0.70	0.70	0.70	0.70	0.70	0.70
(v / s)_i Volume / Saturation Flow Rate	0.10	0.17	0.24	0.35	0.35	0.25	0.22	0.22
s, saturation flow rate [veh/h]	1706	1705	471	3560	1840	244	3560	1817
c, Capacity [veh/h]	387	388	364	2505	1295	214	2505	1278
d1, Uniform Delay [s]	28.60	30.98	9.21	5.37	5.37	13.05	4.51	4.51
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.86	3.07	2.24	0.69	1.34	3.40	0.33	0.64
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.46	0.76	0.31	0.49	0.49	0.29	0.31	0.31
d, Delay for Lane Group [s/veh]	29.46	34.05	11.45	6.06	6.72	16.45	4.83	5.15
Lane Group LOS	C	C	B	A	A	B	A	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	3.06	5.64	1.19	3.73	4.10	0.87	1.98	2.14
50th-Percentile Queue Length [ft/ln]	76.55	141.04	29.72	93.24	102.53	21.83	49.61	53.46
95th-Percentile Queue Length [veh/ln]	5.51	9.54	2.14	6.71	7.38	1.57	3.57	3.85
95th-Percentile Queue Length [ft/ln]	137.78	238.43	53.49	167.84	184.55	39.29	89.30	96.23

Movement, Approach, & Intersection Results

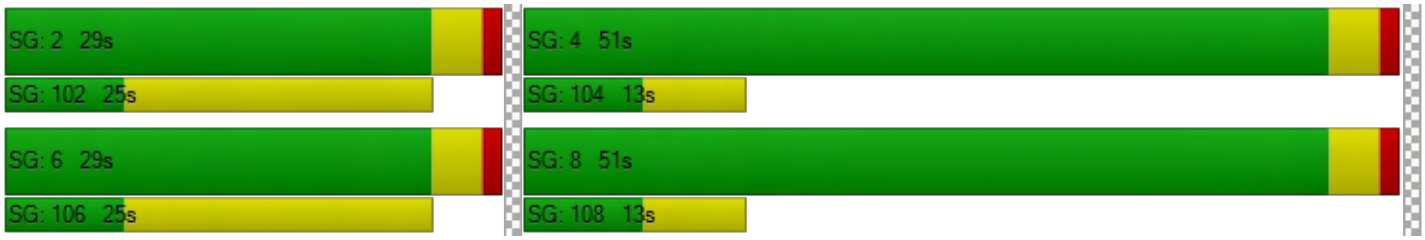
d_M, Delay for Movement [s/veh]	29.46	29.46	29.46	34.05	34.05	34.05	11.45	6.27	6.72	16.45	4.93	5.15
Movement LOS	C	C	C	C	C	C	B	A	A	B	A	A
d_A, Approach Delay [s/veh]	29.46			34.05			6.58			5.51		
Approach LOS	C			C			A			A		
d_I, Intersection Delay [s/veh]	9.51											
Intersection LOS	A											
Intersection V/C	0.578											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.014	2.289	3.075	3.108
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	625	625	1175	1175
d_b, Bicycle Delay [s]	18.91	18.91	6.81	6.81
l_b,int, Bicycle LOS Score for Intersection	1.855	2.046	2.651	2.248
Bicycle LOS	A	B	B	B

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 13: Gaviota Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	12.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	7	1	17	12	1	14	16	136	5	12	125	18
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	2	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	1	17	12	1	14	16	141	5	12	131	18
Peak Hour Factor	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	0	5	4	0	4	5	43	2	4	40	5
Total Analysis Volume [veh/h]	9	1	21	15	1	17	20	172	6	15	160	22
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.02	0.03	0.00	0.02	0.01	0.00	0.00	0.01	0.00	0.00
d_M, Delay for Movement [s/veh]	12.14	12.31	9.35	12.26	12.30	9.39	7.60	0.00	0.00	7.58	0.00	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.14	0.14	0.14	0.16	0.16	0.16	0.03	0.03	0.03	0.03	0.03	0.03
95th-Percentile Queue Length [ft/ln]	3.39	3.39	3.39	3.97	3.97	3.97	0.86	0.86	0.86	0.64	0.64	0.64
d_A, Approach Delay [s/veh]	10.26			10.78			0.77			0.58		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	2.05											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.744

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	1170	144	228	1250	109	155	916	128	93	656	368
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	26	0	0	23	0	0	2	4	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	108	1219	147	233	1298	111	158	936	135	95	670	375
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	305	37	58	325	28	40	234	34	24	168	94
Total Analysis Volume [veh/h]	108	1219	147	233	1298	111	158	936	135	95	670	375
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

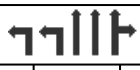
Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.28	0.28	0.07	0.29	0.29	0.10	0.22	0.22	0.06	0.16	0.16
Intersection LOS	C											
Intersection V/C	0.744											

Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.879

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	166	835	219	303	980	183	211	1292	132	318	990	175
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	7	13	13	1	0	15	0	14	29	28
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	169	858	230	322	1013	188	215	1333	135	338	1039	207
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	215	58	81	253	47	54	333	34	85	260	52
Total Analysis Volume [veh/h]	169	858	230	322	1013	188	215	1333	135	338	1039	207
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.18	0.04	0.10	0.25	0.25	0.07	0.31	0.31	0.11	0.26	0.26
Intersection LOS	D											
Intersection V/C	0.879											

Intersection Level Of Service Report

Intersection 16: Cherry Ave (NS) at Burnett St/Skyline Dr (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.625

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	0	0	0	1
Pocket Length [ft]	193.00	100.00	96.00	200.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	94.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	7	1064	31	132	1321	57	38	26	25	26	18	107
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	29	0	0	19	0	0	0	1	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	1114	32	135	1366	58	39	27	27	27	18	109
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	279	8	34	342	15	10	7	7	7	5	27
Total Analysis Volume [veh/h]	9	1114	32	135	1366	58	39	27	27	27	18	109
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.35	0.02	0.08	0.43	0.04	0.02	0.06	0.06	0.02	0.03	0.07
Intersection LOS	B											
Intersection V/C	0.625											

Intersection Level Of Service Report
Intersection 17: Cherry Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.642

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	0	0	0
Pocket Length [ft]	200.00	100.00	100.00	186.00	100.00	89.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	975	9	21	1214	135	112	2	66	5	2	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	29	0	0	17	3	2	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	1024	9	21	1255	141	116	2	67	5	2	10
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	256	2	5	314	35	29	1	17	1	1	3
Total Analysis Volume [veh/h]	50	1024	9	21	1255	141	116	2	67	5	2	10
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.32	0.01	0.01	0.39	0.09	0.07	0.12	0.12	0.00	0.01	0.01
Intersection LOS	B											
Intersection V/C	0.642											

Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.615

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	13	862	11	167	1071	44	55	35	13	7	16	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	24	0	3	14	0	0	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	903	11	173	1106	45	56	36	13	7	16	127
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	226	3	43	277	11	14	9	3	2	4	32
Total Analysis Volume [veh/h]	13	903	11	173	1106	45	56	36	13	7	16	127
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.28	0.01	0.11	0.35	0.03	0.04	0.06	0.01	0.00	0.09	0.09
Intersection LOS	B											
Intersection V/C	0.615											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.505

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	2	822	11	16	1054	16	21	6	24	15	6	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	19	0	3	11	0	0	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	857	11	19	1086	16	21	6	24	15	6	44
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	214	3	5	272	4	5	2	6	4	2	11
Total Analysis Volume [veh/h]	2	857	11	19	1086	16	21	6	24	15	6	44
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.27	0.27	0.01	0.34	0.34	0.01	0.02	0.02	0.01	0.04	0.04
Intersection LOS	A											
Intersection V/C	0.505											

Intersection Level Of Service Report
Intersection 20: Cherry Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	25.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.692

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	118.00	135.00	100.00	100.00	180.00	100.00	100.00	186.00	100.00	100.00
Speed [mph]	30.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	78	419	41	185	588	235	195	1413	78	72	891	170
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	5	0	8	3	0	0	12	0	0	19	14
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	80	432	42	197	603	240	199	1453	80	73	928	187
Peak Hour Factor	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	111	11	50	154	61	51	372	20	19	238	48
Total Analysis Volume [veh/h]	82	443	43	202	618	246	204	1489	82	75	951	192
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	79.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	29	0	11	29	0	13	29	0	11	27	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	0	0	0	12	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	16	16	27	17	17	11	35	35	6	30	30
g / C, Green / Cycle	0.34	0.20	0.20	0.34	0.22	0.22	0.14	0.44	0.44	0.07	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.08	0.13	0.13	0.17	0.17	0.15	0.11	0.29	0.29	0.04	0.22	0.22
s, saturation flow rate [veh/h]	1088	1870	1813	1197	3560	1589	1781	3560	1820	1781	3560	1714
c, Capacity [veh/h]	374	384	372	434	779	348	248	1547	791	129	1310	631
d1, Uniform Delay [s]	19.36	29.18	29.21	20.28	29.63	28.97	33.58	18.11	18.11	36.03	20.45	20.46
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.29	1.80	1.88	0.78	1.88	2.65	6.78	2.34	4.53	4.09	1.94	4.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.22	0.64	0.65	0.47	0.79	0.71	0.82	0.67	0.67	0.58	0.59	0.59
d, Delay for Lane Group [s/veh]	19.65	30.98	31.09	21.05	31.51	31.62	40.36	20.45	22.64	40.12	22.39	24.47
Lane Group LOS	B	C	C	C	C	C	D	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.04	4.39	4.29	2.77	5.63	4.48	4.17	7.43	8.09	1.52	5.73	5.90
50th-Percentile Queue Length [ft/ln]	26.00	109.77	107.24	69.26	140.70	111.97	104.14	185.72	202.25	38.01	143.27	147.38
95th-Percentile Queue Length [veh/ln]	1.87	7.83	7.69	4.99	9.52	7.95	7.50	11.90	12.75	2.74	9.66	9.88
95th-Percentile Queue Length [ft/ln]	46.80	195.68	192.16	124.66	237.96	198.73	187.45	297.47	318.87	68.42	241.42	246.93

Movement, Approach, & Intersection Results

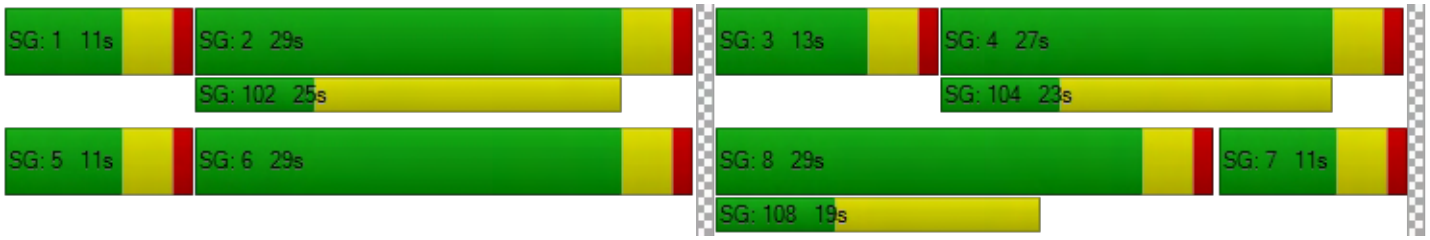
d_M, Delay for Movement [s/veh]	19.65	31.03	31.09	21.05	31.51	31.62	40.36	21.11	22.64	40.12	22.78	24.47
Movement LOS	B	C	C	C	C	C	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	29.39			29.55			23.39			24.12		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	25.74											
Intersection LOS	C											
Intersection V/C	0.692											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	0.00	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.555	2.756	0.000	3.133
Crosswalk LOS	B	C	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	625	625	625	575
d_b, Bicycle Delay [s]	18.91	18.91	18.91	20.31
l_b,int, Bicycle LOS Score for Intersection	2.028	2.439	2.536	2.230
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Opening Year With Project

Signal Hill Business Park

Vistro File: G:\...\AM Base.vistro
Report File: G:\...\OYP AM.pdf

Scenario 4 Opening Year With Project
7/3/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Orange Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Thru	0.832	-	D
2	Orange Ave (NS) at Willow St (EW)	Signalized	ICU 1	NB Thru	0.773	-	C
3	Orange Ave (NS) at Burnett St (EW)	Signalized	ICU 1	NB Thru	0.673	-	B
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Right	0.768	-	C
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.639	24.0	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.106	13.9	B
7	Walnut Ave (NS) at Spring St (EW)	Signalized	ICU 1	WB Thru	0.638	-	B
8	Walnut Ave (NS) at Willow St (EW)	Signalized	ICU 1	WB Thru	0.520	-	A
9	Walnut Ave (NS) at Burnett St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.744	17.5	C
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.614	15.4	C
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	NB Right	0.598	-	A
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.873	10.7	B
13	Gaviota Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	SB Thru	0.002	12.4	B
14	Cherry Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Thru	0.768	-	C
15	Cherry Ave (NS) at Willow St (EW)	Signalized	ICU 1	WB Thru	0.737	-	C
16	Cherry Ave (NS) at Burnett St/Skyline Dr (EW)	Signalized	ICU 1	NB Thru	0.645	-	B
17	Cherry Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Thru	0.617	-	B
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	NB Thru	0.675	-	B

19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	NB Thru	0.541	-	A
20	Cherry Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.815	29.0	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Orange Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.832

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	160.00	75.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	28	579	57	99	518	130	88	610	65	107	942	141
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	21	8	19	42	0	0	8	0	4	2	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	29	612	66	120	570	133	90	630	66	113	963	149
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	153	17	30	143	33	23	158	17	28	241	37
Total Analysis Volume [veh/h]	29	612	66	120	570	133	90	630	66	113	963	149
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.19	0.04	0.08	0.36	0.08	0.06	0.20	0.04	0.07	0.30	0.09
Intersection LOS	D											
Intersection V/C	0.832											

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.773

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	82	492	92	40	439	83	84	931	72	69	1128	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	12	0	8	36	2	4	30	21	0	16	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	514	94	49	484	87	90	980	94	70	1167	76
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	129	24	12	121	22	23	245	24	18	292	19
Total Analysis Volume [veh/h]	89	514	94	49	484	87	90	980	94	70	1167	76
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.32	0.00	0.03	0.30	0.05	0.06	0.22	0.22	0.04	0.26	0.26
Intersection LOS	C											
Intersection V/C	0.773											

Intersection Level Of Service Report
Intersection 3: Orange Ave (NS) at Burnett St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.673

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	110.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	21	616	30	32	536	11	24	96	28	57	64	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	17	16	1	56	0	0	3	0	26	4	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	645	47	34	603	11	24	101	29	84	69	22
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	161	12	9	151	3	6	25	7	21	17	6
Total Analysis Volume [veh/h]	21	645	47	34	603	11	24	101	29	84	69	22
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.40	0.03	0.02	0.38	0.01	0.02	0.10	0.10	0.05	0.11	0.11
Intersection LOS	B											
Intersection V/C	0.673											

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.768

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	40	667	22	28	526	25	78	90	38	47	124	57
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	3	54	19	9	6	9	0	4	2	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	41	695	25	83	556	35	86	101	39	52	128	71
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	174	6	21	139	9	22	25	10	13	32	18
Total Analysis Volume [veh/h]	41	695	25	83	556	35	86	101	39	52	128	71
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.45	0.45	0.05	0.37	0.37	0.05	0.12	0.02	0.03	0.11	0.04
Intersection LOS	C											
Intersection V/C	0.768											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	24.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.639

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	511	198	53	345	101	104	864	67	239	1360	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	5	8	0	7	16	13	56	0	1	13	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	100	526	210	54	359	119	119	937	68	245	1400	103
Peak Hour Factor	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	147	59	15	100	33	33	262	19	68	391	29
Total Analysis Volume [veh/h]	112	588	235	60	401	133	133	1047	76	274	1564	115
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	14	34	0	25	45	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	24	24	44	24	24	24	8	38	38	16	46	46
g / C, Green / Cycle	0.27	0.27	0.49	0.27	0.27	0.27	0.09	0.42	0.42	0.18	0.51	0.51
(v / s)_i Volume / Saturation Flow Rate	0.11	0.17	0.15	0.07	0.11	0.08	0.07	0.21	0.21	0.15	0.31	0.31
s, saturation flow rate [veh/h]	984	3560	1589	828	3560	1589	1781	3560	1806	1781	3560	1805
c, Capacity [veh/h]	228	949	784	161	949	424	168	1488	755	325	1801	913
d1, Uniform Delay [s]	36.68	29.02	13.57	39.50	27.30	26.44	39.92	19.31	19.31	35.60	16.01	16.04
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.63	0.66	0.21	1.42	0.30	0.42	8.04	1.21	2.37	5.97	1.60	3.16
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.49	0.62	0.30	0.37	0.42	0.31	0.79	0.50	0.50	0.84	0.62	0.62
d, Delay for Lane Group [s/veh]	38.31	29.68	13.78	40.92	27.60	26.86	47.96	20.51	21.68	41.56	17.61	19.20
Lane Group LOS	D	C	B	D	C	C	D	C	C	D	B	B
Critical Lane Group	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.39	5.44	2.68	1.33	3.53	2.29	3.19	5.65	5.98	6.16	7.89	8.44
50th-Percentile Queue Length [ft/ln]	59.83	136.09	66.99	33.37	88.18	57.24	79.68	141.23	149.48	153.94	197.33	211.11
95th-Percentile Queue Length [veh/ln]	4.31	9.27	4.82	2.40	6.35	4.12	5.74	9.55	9.99	10.23	12.50	13.21
95th-Percentile Queue Length [ft/ln]	107.69	231.75	120.59	60.07	158.72	103.04	143.42	238.67	249.73	255.68	312.52	330.25

Movement, Approach, & Intersection Results

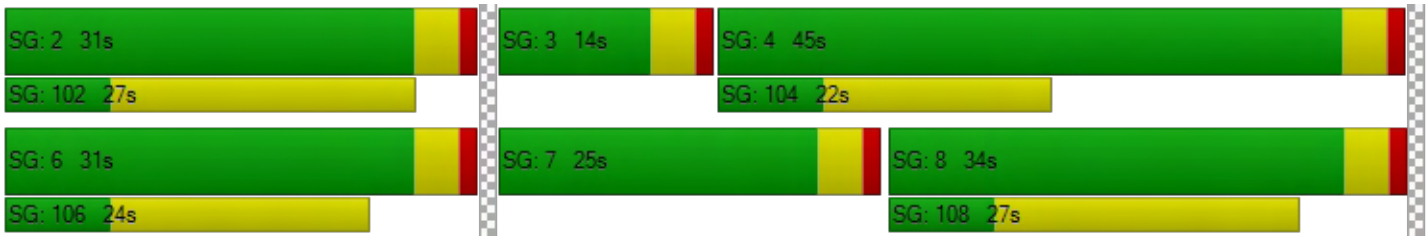
d_M, Delay for Movement [s/veh]	38.31	29.68	13.78	40.92	27.60	26.86	47.96	20.85	21.68	41.56	18.07	19.20
Movement LOS	D	C	B	D	C	C	D	C	C	D	B	B
d_A, Approach Delay [s/veh]	26.72			28.78			23.77			21.43		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	24.02											
Intersection LOS	C											
Intersection V/C	0.639											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.772	2.685	3.251	3.214
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	600	600	667	911
d_b, Bicycle Delay [s]	22.05	22.05	20.00	13.34
l_b,int, Bicycle LOS Score for Intersection	2.331	2.050	2.250	2.634
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	13.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.106

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	16	6	120	5	5	228
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	0	18	49	0	4
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	6	140	54	5	237
Peak Hour Factor	0.6710	0.6710	0.6710	0.6710	0.6710	0.6710
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	2	52	20	2	88
Total Analysis Volume [veh/h]	48	9	209	80	7	353
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.01	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	13.90	10.51	0.00	0.00	7.82	0.00
Movement LOS	B	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.39	0.39	0.00	0.00	0.01	0.01
95th-Percentile Queue Length [ft/ln]	9.87	9.87	0.00	0.00	0.29	0.29
d_A, Approach Delay [s/veh]	13.37		0.00		0.15	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	1.16					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 7: Walnut Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.638

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	102.00	100.00	100.00	98.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	90	102	62	29	119	46	31	635	55	102	1052	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	0	0	9	0	0	9	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	92	107	63	30	130	47	32	657	56	104	1076	44
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	27	16	8	33	12	8	164	14	26	269	11
Total Analysis Volume [veh/h]	92	107	63	30	130	47	32	657	56	104	1076	44
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.07	0.04	0.02	0.11	0.11	0.02	0.22	0.22	0.07	0.35	0.35
Intersection LOS	B											
Intersection V/C	0.638											

Intersection Level Of Service Report
Intersection 8: Walnut Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.520

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	106.00	100.00	100.00	100.00	100.00	100.00	204.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	158	160	39	106	32	32	982	41	50	1199	69
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	22	3	5	0	9	0	0	24	14	3	7	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	74	164	168	40	117	33	33	1026	56	54	1230	70
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	41	42	10	29	8	8	257	14	14	308	18
Total Analysis Volume [veh/h]	74	164	168	40	117	33	33	1026	56	54	1230	70
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.10	0.10	0.03	0.04	0.02	0.02	0.23	0.23	0.03	0.27	0.27
Intersection LOS	A											
Intersection V/C	0.520											

Intersection Level Of Service Report
Intersection 9: Walnut Ave (NS) at Burnett St (EW)

Control Type:	All-way stop	Delay (sec / veh):	17.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.744

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	44	281	25	10	140	40	37	43	60	41	84	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	3	1	10	4	1	18	1	4	26	1
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	45	290	29	11	153	45	39	62	62	46	112	17
Peak Hour Factor	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	90	9	3	48	14	12	19	19	14	35	5
Total Analysis Volume [veh/h]	56	360	36	14	190	56	48	77	77	57	139	21
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	559	637	533	600	567	556
Degree of Utilization, x	0.74	0.06	0.38	0.09	0.36	0.39

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	6.42	0.18	1.78	0.31	1.61	1.84
95th-Percentile Queue Length [ft]	160.42	4.49	44.58	7.69	40.13	46.00
Approach Delay [s/veh]	24.18		12.66		12.83	13.56
Approach LOS	C		B		B	B
Intersection Delay [s/veh]	17.47					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	15.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.614

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	22	207	8	48	131	137	21	77	26	23	70	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	4	6	17	0	13	0	0	0	18	56	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	217	25	49	147	140	21	79	45	79	71	36
Peak Hour Factor	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	71	8	16	48	46	7	26	15	26	23	12
Total Analysis Volume [veh/h]	34	286	33	65	194	184	28	104	59	104	94	47
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	575	531	606	541	544
Degree of Utilization, x	0.61	0.49	0.30	0.35	0.45

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.15	2.65	1.28	1.58	2.31
95th-Percentile Queue Length [ft]	103.83	66.31	31.93	39.53	57.82
Approach Delay [s/veh]	18.72	13.88		13.25	14.92
Approach LOS	C	B		B	B
Intersection Delay [s/veh]	15.37				
Intersection LOS	C				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.598

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	167	44	34	125	44	64	107	82	47	105	25
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	81	0	0	22	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	251	45	35	150	45	65	109	84	48	107	26
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	63	11	9	38	11	16	27	21	12	27	7
Total Analysis Volume [veh/h]	50	251	45	35	150	45	65	109	84	48	107	26
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.19	0.19	0.02	0.12	0.12	0.04	0.16	0.16	0.03	0.11	0.11
Intersection LOS	A											
Intersection V/C	0.598											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	10.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.873

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	101	43	38	45	106	89	1032	83	34	1618	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	4	0	8	6	8	47	17	0	0	6	30
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	107	44	47	52	116	138	1070	85	35	1656	122
Peak Hour Factor	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	29	12	13	14	31	37	289	23	9	448	33
Total Analysis Volume [veh/h]	56	116	48	51	56	125	149	1157	92	38	1790	132
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	49.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	29	0	0	29	0	0	61	0	0	61	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	16	16	66	66	66	66	66	66
g / C, Green / Cycle	0.17	0.17	0.74	0.74	0.74	0.74	0.74	0.74
(v / s)_i Volume / Saturation Flow Rate	0.15	0.15	0.64	0.23	0.23	0.09	0.36	0.36
s, saturation flow rate [veh/h]	1441	1503	232	3560	1800	445	3560	1805
c, Capacity [veh/h]	301	311	212	2624	1327	363	2624	1330
d1, Uniform Delay [s]	35.74	36.00	22.25	4.06	4.06	6.52	4.85	4.86
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.40	3.58	17.64	0.32	0.63	0.58	0.65	1.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.73	0.75	0.70	0.32	0.32	0.10	0.49	0.49
d, Delay for Lane Group [s/veh]	39.13	39.58	39.88	4.38	4.69	7.10	5.49	6.14
Lane Group LOS	D	D	D	A	A	A	A	A
Critical Lane Group	No	Yes	Yes	No	No	No	No	No
50th-Percentile Queue Length [veh/ln]	4.87	5.16	4.32	2.12	2.26	0.32	3.91	4.23
50th-Percentile Queue Length [ft/ln]	121.71	129.08	108.02	53.05	56.51	7.93	97.87	105.69
95th-Percentile Queue Length [veh/ln]	8.49	8.89	7.73	3.82	4.07	0.57	7.05	7.60
95th-Percentile Queue Length [ft/ln]	212.18	222.24	193.24	95.50	101.71	14.28	176.16	189.99

Movement, Approach, & Intersection Results

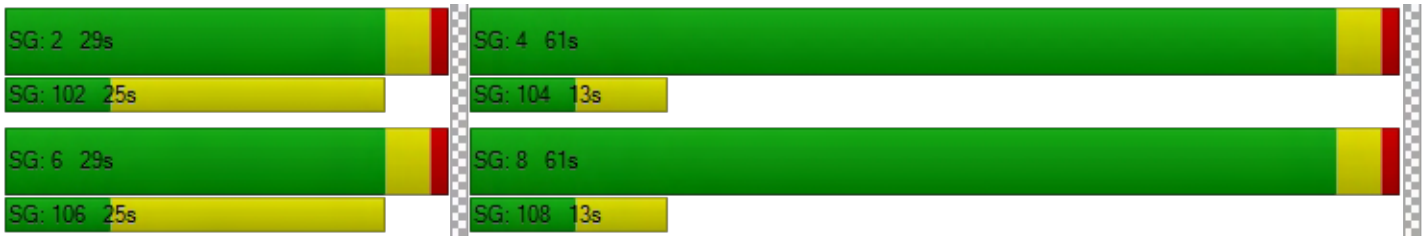
d_M, Delay for Movement [s/veh]	39.13	39.13	39.13	39.58	39.58	39.58	39.88	4.46	4.69	7.10	5.68	6.14
Movement LOS	D	D	D	D	D	D	D	A	A	A	A	A
d_A, Approach Delay [s/veh]	39.13			39.58			8.25			5.74		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	10.65											
Intersection LOS	B											
Intersection V/C	0.873											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	1.966	2.356	3.142	3.114
Crosswalk LOS	A	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	556	556	1267	1267
d_b, Bicycle Delay [s]	23.47	23.47	6.05	6.05
l_b,int, Bicycle LOS Score for Intersection	1.923	1.942	2.329	2.638
Bicycle LOS	A	A	B	B

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 13: Gaviota Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	12.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	16	4	16	18	1	12	3	115	12	15	97	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	17	0	0	56	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	4	16	18	1	12	3	134	12	15	155	5
Peak Hour Factor	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	1	5	6	0	4	1	41	4	5	48	2
Total Analysis Volume [veh/h]	20	5	20	22	1	15	4	166	15	19	192	6
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.01	0.02	0.04	0.00	0.02	0.00	0.00	0.00	0.01	0.00	0.00
d_M, Delay for Movement [s/veh]	12.25	12.35	9.54	12.34	12.36	9.62	7.60	0.00	0.00	7.59	0.00	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.23	0.23	0.23	0.20	0.20	0.20	0.01	0.01	0.01	0.03	0.03	0.03
95th-Percentile Queue Length [ft/ln]	5.66	5.66	5.66	4.95	4.95	4.95	0.16	0.16	0.16	0.81	0.81	0.81
d_A, Approach Delay [s/veh]	11.06			11.27			0.16			0.66		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	2.27											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.768

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	86	1069	170	281	1098	137	120	544	75	105	1052	358
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	21	1	0	46	0	0	1	8	5	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	90	1111	174	287	1166	140	122	556	85	112	1074	365
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	278	44	72	292	35	31	139	21	28	269	91
Total Analysis Volume [veh/h]	90	1111	174	287	1166	140	122	556	85	112	1074	365
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

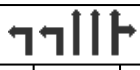
Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.27	0.27	0.09	0.27	0.27	0.08	0.13	0.13	0.07	0.22	0.22
Intersection LOS	C											
Intersection V/C	0.768											

Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.737

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	167	1031	161	149	765	147	177	836	85	231	1124	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	24	28	31	0	1	28	0	51	10	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	170	1067	188	180	811	150	182	881	87	287	1156	126
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	43	267	47	45	203	38	46	220	22	72	289	32
Total Analysis Volume [veh/h]	170	1067	188	180	811	150	182	881	87	287	1156	126
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.22	0.03	0.06	0.20	0.20	0.06	0.20	0.20	0.09	0.27	0.27
Intersection LOS	C											
Intersection V/C	0.737											

Intersection Level Of Service Report

Intersection 16: Cherry Ave (NS) at Burnett St/Skyline Dr (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.645

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	0	0	0	1
Pocket Length [ft]	193.00	100.00	96.00	200.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	94.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	34	1301	17	52	919	65	21	26	11	12	36	115
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	36	0	0	91	0	0	0	1	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	36	1363	17	53	1028	66	21	27	12	12	37	117
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	341	4	13	257	17	5	7	3	3	9	29
Total Analysis Volume [veh/h]	36	1363	17	53	1028	66	21	27	12	12	37	117
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.43	0.01	0.03	0.32	0.04	0.01	0.04	0.04	0.01	0.03	0.07
Intersection LOS	B											
Intersection V/C	0.645											

Intersection Level Of Service Report
Intersection 17: Cherry Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.617

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	0	0	0
Pocket Length [ft]	200.00	100.00	100.00	186.00	100.00	89.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	41	1200	4	11	844	88	112	1	55	6	3	23
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	20	0	0	36	56	17	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	42	1244	4	11	897	146	131	1	56	6	3	23
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	311	1	3	224	37	33	0	14	2	1	6
Total Analysis Volume [veh/h]	42	1244	4	11	897	146	131	1	56	6	3	23
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.39	0.00	0.01	0.28	0.09	0.08	0.12	0.12	0.00	0.02	0.02
Intersection LOS	B											
Intersection V/C	0.617											

Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.675

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	1035	10	62	763	88	79	47	62	11	77	150
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	0	4	19	13	2	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	1071	10	67	797	103	83	48	63	11	79	156
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	268	3	17	199	26	21	12	16	3	20	39
Total Analysis Volume [veh/h]	50	1071	10	67	797	103	83	48	63	11	79	156
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.33	0.01	0.04	0.25	0.06	0.05	0.08	0.04	0.01	0.15	0.15
Intersection LOS	B											
Intersection V/C	0.675											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.541

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	18	890	14	7	844	34	75	9	109	26	15	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	12	0	4	15	0	0	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	920	14	11	876	35	77	9	111	27	15	66
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	230	4	3	219	9	19	2	28	7	4	17
Total Analysis Volume [veh/h]	18	920	14	11	876	35	77	9	111	27	15	66
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.29	0.29	0.01	0.28	0.28	0.05	0.08	0.08	0.02	0.07	0.07
Intersection LOS	A											
Intersection V/C	0.541											

Intersection Level Of Service Report
Intersection 20: Cherry Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	29.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.815

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	118.00	135.00	100.00	100.00	180.00	100.00	100.00	186.00	100.00	100.00
Speed [mph]	30.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	78	565	22	129	432	256	190	919	65	34	1309	204
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	3	0	11	4	0	0	24	1	0	28	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	88	579	22	143	445	261	194	961	67	35	1363	217
Peak Hour Factor	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	154	6	38	118	69	51	255	18	9	362	58
Total Analysis Volume [veh/h]	93	615	23	152	472	277	206	1020	71	37	1447	230
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	6.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	29	0	11	29	0	15	39	0	11	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	0	0	0	12	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	29	18	18	29	19	19	12	45	45	4	36	36
g / C, Green / Cycle	0.32	0.20	0.20	0.32	0.21	0.21	0.14	0.49	0.49	0.05	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.08	0.17	0.17	0.14	0.13	0.17	0.12	0.20	0.20	0.02	0.32	0.32
s, saturation flow rate [veh/h]	1169	1870	1846	1097	3560	1589	1781	3560	1808	1781	3560	1742
c, Capacity [veh/h]	385	378	373	343	746	333	245	1757	892	86	1440	704
d1, Uniform Delay [s]	22.44	34.65	34.66	24.03	32.49	34.13	37.93	14.52	14.52	41.70	23.39	23.41
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.32	5.36	5.45	0.90	0.89	5.40	7.62	0.72	1.41	3.36	4.29	8.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.24	0.85	0.85	0.44	0.63	0.83	0.84	0.41	0.41	0.43	0.78	0.78
d, Delay for Lane Group [s/veh]	22.76	40.02	40.11	24.92	33.38	39.53	45.55	15.23	15.92	45.06	27.68	31.91
Lane Group LOS	C	D	D	C	C	D	D	B	B	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.41	7.18	7.11	2.41	4.69	6.17	4.82	4.51	4.75	0.86	10.55	11.17
50th-Percentile Queue Length [ft/ln]	35.24	179.53	177.65	60.37	117.25	154.20	120.58	112.63	118.74	21.58	263.70	279.31
95th-Percentile Queue Length [veh/ln]	2.54	11.58	11.48	4.35	8.24	10.24	8.42	7.99	8.32	1.55	15.87	16.65
95th-Percentile Queue Length [ft/ln]	63.44	289.41	286.94	108.66	206.04	256.03	210.62	199.65	208.09	38.85	396.85	416.35

Movement, Approach, & Intersection Results

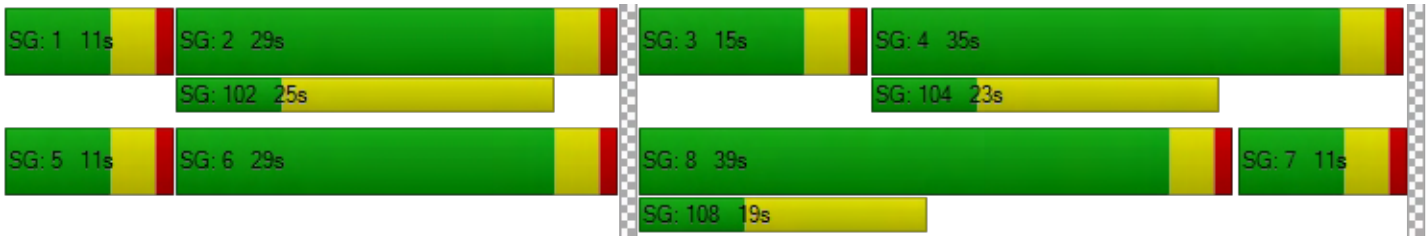
d_M, Delay for Movement [s/veh]	22.76	40.06	40.11	24.92	33.38	39.53	45.55	15.43	15.92	45.06	28.62	31.91
Movement LOS	C	D	D	C	C	D	D	B	B	D	C	C
d_A, Approach Delay [s/veh]	37.86			33.84			20.24			29.41		
Approach LOS	D			C			C			C		
d_I, Intersection Delay [s/veh]	29.04											
Intersection LOS	C											
Intersection V/C	0.815											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.555	2.770	0.000	3.115
Crosswalk LOS	B	C	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	556	556	778	689
d_b, Bicycle Delay [s]	23.47	23.47	16.81	19.34
l_b,int, Bicycle LOS Score for Intersection	2.163	2.303	2.273	2.502
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Signal Hill Business Park

Vistro File: G:\...\PM Base.vistro
Report File: G:\...\OYP PM.pdf

Scenario 4 Opening Year With Project
7/3/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Orange Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Thru	0.851	-	D
2	Orange Ave (NS) at Willow St (EW)	Signalized	ICU 1	EB Thru	0.890	-	D
3	Orange Ave (NS) at Burnett St (EW)	Signalized	ICU 1	SB Thru	0.646	-	B
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	SB Right	0.668	-	B
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.656	22.1	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.099	12.0	B
7	Walnut Ave (NS) at Spring St (EW)	Signalized	ICU 1	EB Thru	0.674	-	B
8	Walnut Ave (NS) at Willow St (EW)	Signalized	ICU 1	EB Thru	0.677	-	B
9	Walnut Ave (NS) at Burnett St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.613	15.0	C
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.569	14.0	B
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	SB Thru	0.531	-	A
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	SB Thru	0.629	11.4	B
13	Gaviota Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	SB Left	0.033	13.2	B
14	Cherry Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Thru	0.746	-	C
15	Cherry Ave (NS) at Willow St (EW)	Signalized	ICU 1	EB Right	0.885	-	D
16	Cherry Ave (NS) at Burnett St/Skyline Dr (EW)	Signalized	ICU 1	SB Thru	0.643	-	B
17	Cherry Ave (NS) at Hill St (EW)	Signalized	ICU 1	SB Thru	0.672	-	B
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	SB Thru	0.622	-	B

19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	SB Thru	0.505	-	A
20	Cherry Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.698	25.8	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Orange Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.851

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	160.00	75.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	58	586	58	102	564	190	129	935	54	50	662	160
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	39	6	13	28	0	0	4	0	10	8	20
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	59	637	65	117	603	194	132	958	55	61	683	183
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	159	16	29	151	49	33	240	14	15	171	46
Total Analysis Volume [veh/h]	59	637	65	117	603	194	132	958	55	61	683	183
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.20	0.04	0.07	0.38	0.12	0.08	0.30	0.03	0.04	0.21	0.11
Intersection LOS	D											
Intersection V/C	0.851											

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.890

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	460	101	73	500	67	89	1451	74	135	1077	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	19	34	0	16	17	5	3	22	8	0	29	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	71	503	103	90	527	73	94	1502	83	138	1128	91
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	126	26	23	132	18	24	376	21	35	282	23
Total Analysis Volume [veh/h]	71	503	103	90	527	73	94	1502	83	138	1128	91
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.31	0.00	0.06	0.33	0.05	0.06	0.33	0.33	0.09	0.25	0.25
Intersection LOS	D											
Intersection V/C	0.890											

Intersection Level Of Service Report
Intersection 3: Orange Ave (NS) at Burnett St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.646

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	110.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	10	552	35	26	649	29	17	47	20	40	66	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	51	31	0	25	0	0	5	0	15	3	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	614	67	27	687	30	17	53	20	56	70	33
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	154	17	7	172	8	4	13	5	14	18	8
Total Analysis Volume [veh/h]	10	614	67	27	687	30	17	53	20	56	70	33
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.38	0.04	0.02	0.43	0.02	0.01	0.06	0.06	0.04	0.10	0.10
Intersection LOS	B											
Intersection V/C	0.646											

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.668

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	31	563	33	27	592	43	36	107	30	42	103	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	20	16	5	11	3	0	3	8	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	597	37	48	620	49	48	112	31	46	113	83
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	149	9	12	155	12	12	28	8	12	28	21
Total Analysis Volume [veh/h]	32	597	37	48	620	49	48	112	31	46	113	83
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.40	0.40	0.03	0.42	0.42	0.03	0.10	0.02	0.03	0.10	0.05
Intersection LOS	B											
Intersection V/C	0.668											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	22.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.656

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	73	495	277	80	499	97	84	1383	105	183	879	79
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	2	0	6	13	18	22	0	7	50	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	74	513	285	82	515	112	104	1433	107	194	947	81
Peak Hour Factor	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	131	73	21	132	29	27	367	27	50	243	21
Total Analysis Volume [veh/h]	76	526	292	84	528	115	107	1468	110	199	970	83
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	12	33	0	16	37	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	23	23	39	23	23	23	6	34	34	12	39	39
g / C, Green / Cycle	0.28	0.28	0.48	0.28	0.28	0.28	0.08	0.42	0.42	0.15	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.09	0.15	0.18	0.10	0.15	0.07	0.06	0.29	0.29	0.11	0.20	0.20
s, saturation flow rate [veh/h]	875	3560	1589	877	3560	1589	1781	3560	1804	1781	3560	1796
c, Capacity [veh/h]	204	1002	766	204	1002	447	145	1490	755	268	1735	875
d1, Uniform Delay [s]	33.23	24.29	13.19	33.51	24.31	22.32	35.97	19.20	19.21	32.57	13.11	13.12
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.13	0.43	0.31	1.32	0.43	0.30	7.04	2.80	5.43	4.05	0.70	1.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.37	0.53	0.38	0.41	0.53	0.26	0.74	0.70	0.70	0.74	0.40	0.40
d, Delay for Lane Group [s/veh]	34.36	24.72	13.50	34.84	24.74	22.62	43.01	22.00	24.64	36.62	13.81	14.50
Lane Group LOS	C	C	B	C	C	C	D	C	C	D	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.42	4.03	3.08	1.60	4.12	1.66	2.26	7.86	8.53	3.84	3.78	3.98
50th-Percentile Queue Length [ft/ln]	35.38	100.72	77.00	40.07	102.93	41.50	56.47	196.59	213.24	96.07	94.44	99.51
95th-Percentile Queue Length [veh/ln]	2.55	7.25	5.54	2.89	7.41	2.99	4.07	12.46	13.32	6.92	6.80	7.17
95th-Percentile Queue Length [ft/ln]	63.68	181.29	138.60	72.13	185.27	74.70	101.65	311.56	332.99	172.93	170.00	179.13

Movement, Approach, & Intersection Results

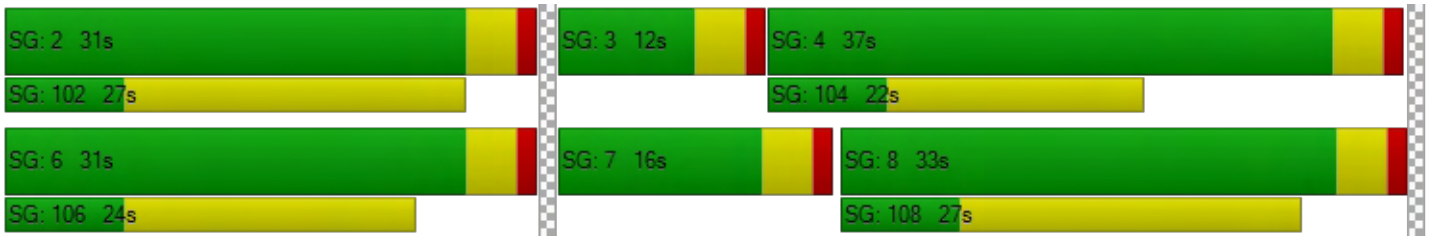
d_M, Delay for Movement [s/veh]	34.36	24.72	13.50	34.84	24.74	22.62	43.01	22.76	24.64	36.62	14.00	14.50
Movement LOS	C	C	B	C	C	C	D	C	C	D	B	B
d_A, Approach Delay [s/veh]	21.88			25.57			24.17			17.63		
Approach LOS	C			C			C			B		
d_I, Intersection Delay [s/veh]	22.15											
Intersection LOS	C											
Intersection V/C	0.656											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.774	2.681	3.158	3.210
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	675	675	725	825
d_b, Bicycle Delay [s]	17.56	17.56	16.26	13.81
l_b,int, Bicycle LOS Score for Intersection	2.297	2.159	2.486	2.248
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	12.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.099

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	4	6	146	4	4	179
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	44	0	6	20	0	16
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	48	6	155	24	4	199
Peak Hour Factor	0.8490	0.8490	0.8490	0.8490	0.8490	0.8490
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	2	46	7	1	59
Total Analysis Volume [veh/h]	57	7	183	28	5	234
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	11.99	9.96	0.00	0.00	7.63	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.36	0.36	0.00	0.00	0.01	0.01
95th-Percentile Queue Length [ft/ln]	8.97	8.97	0.00	0.00	0.22	0.22
d_A, Approach Delay [s/veh]	11.76		0.00		0.16	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	1.54					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 7: Walnut Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.674

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	102.00	100.00	100.00	98.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	106	214	137	42	109	29	73	1046	91	65	738	66
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	0	0	3	0	0	6	0	0	9	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	108	226	140	43	114	30	74	1073	93	66	762	67
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	57	35	11	29	8	19	268	23	17	191	17
Total Analysis Volume [veh/h]	108	226	140	43	114	30	74	1073	93	66	762	67
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.14	0.09	0.03	0.09	0.09	0.05	0.36	0.36	0.04	0.26	0.26
Intersection LOS	B											
Intersection V/C	0.674											

Intersection Level Of Service Report
Intersection 8: Walnut Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.677

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	106.00	100.00	100.00	100.00	100.00	100.00	204.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	61	179	183	80	152	51	49	1520	56	94	1168	60
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	13	8	4	0	3	0	0	11	27	6	24	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	75	191	191	82	158	52	50	1561	84	102	1215	61
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	48	48	21	40	13	13	390	21	26	304	15
Total Analysis Volume [veh/h]	75	191	191	82	158	52	50	1561	84	102	1215	61
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.12	0.12	0.05	0.05	0.03	0.03	0.34	0.34	0.06	0.27	0.27
Intersection LOS	B											
Intersection V/C	0.677											

Intersection Level Of Service Report
Intersection 9: Walnut Ave (NS) at Burnett St (EW)

Control Type:	All-way stop	Delay (sec / veh):	15.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.613

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	15	298	21	22	253	22	53	76	15	21	64	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	9	5	1	3	2	4	32	0	3	16	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	17	313	26	23	261	24	58	110	15	24	81	15
Peak Hour Factor	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	85	7	6	71	7	16	30	4	7	22	4
Total Analysis Volume [veh/h]	19	341	28	25	285	26	63	120	16	26	88	16
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	588	668	579	659	576	563
Degree of Utilization, x	0.61	0.04	0.54	0.04	0.35	0.23

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.15	0.13	3.16	0.12	1.53	0.89
95th-Percentile Queue Length [ft]	103.66	3.28	79.01	3.08	38.35	22.16
Approach Delay [s/veh]	17.35		15.28		12.51	11.30
Approach LOS	C		C		B	B
Intersection Delay [s/veh]	15.03					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	14.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.569

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	23	201	22	34	217	57	34	100	21	21	96	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	13	48	0	6	0	0	0	6	19	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	39	218	70	35	227	58	35	102	27	40	98	34
Peak Hour Factor	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	60	19	10	62	16	10	28	7	11	27	9
Total Analysis Volume [veh/h]	43	239	77	38	248	63	38	112	30	44	107	37
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	632	572	652	575	578
Degree of Utilization, x	0.57	0.50	0.10	0.31	0.33

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.58	2.79	0.32	1.33	1.41
95th-Percentile Queue Length [ft]	89.46	69.69	7.99	33.28	35.13
Approach Delay [s/veh]	15.95	14.00		12.09	12.20
Approach LOS	C	B		B	B
Intersection Delay [s/veh]	14.01				
Intersection LOS	B				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.531

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	26	199	44	28	193	31	47	83	29	39	37	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	31	0	0	71	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	234	45	29	268	32	48	85	30	40	38	21
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	59	11	7	67	8	12	21	8	10	10	5
Total Analysis Volume [veh/h]	27	234	45	29	268	32	48	85	30	40	38	21
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.17	0.17	0.02	0.19	0.19	0.03	0.10	0.10	0.03	0.06	0.06
Intersection LOS	A											
Intersection V/C	0.531											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	11.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.629

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	25	106	29	51	134	84	107	1682	54	58	1030	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	27	4	40	14	10	0	0	17	11
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	114	30	79	141	126	123	1726	55	59	1068	73
Peak Hour Factor	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	30	8	21	37	33	32	453	14	15	280	19
Total Analysis Volume [veh/h]	27	120	32	83	148	132	129	1813	58	62	1122	77
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	32.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	31	0	0	31	0	0	49	0	0	49	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	19	19	53	53	53	53	53	53
g / C, Green / Cycle	0.24	0.24	0.66	0.66	0.66	0.66	0.66	0.66
(v / s)_i Volume / Saturation Flow Rate	0.11	0.22	0.28	0.35	0.35	0.25	0.22	0.22
s, saturation flow rate [veh/h]	1683	1655	467	3560	1840	244	3560	1809
c, Capacity [veh/h]	458	455	336	2344	1212	198	2344	1191
d1, Uniform Delay [s]	25.48	29.15	12.38	7.13	7.13	16.67	6.00	6.00
k, delay calibration	0.11	0.14	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.54	4.31	3.31	0.85	1.64	4.09	0.39	0.77
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.39	0.80	0.38	0.53	0.53	0.31	0.34	0.34
d, Delay for Lane Group [s/veh]	26.02	33.47	15.69	7.97	8.78	20.76	6.39	6.77
Lane Group LOS	C	C	B	A	A	C	A	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.84	6.99	1.67	4.72	5.16	1.02	2.54	2.71
50th-Percentile Queue Length [ft/ln]	70.91	174.83	41.79	118.02	129.08	25.40	63.53	67.75
95th-Percentile Queue Length [veh/ln]	5.11	11.33	3.01	8.28	8.89	1.83	4.57	4.88
95th-Percentile Queue Length [ft/ln]	127.65	283.25	75.22	207.11	222.25	45.71	114.35	121.96

Movement, Approach, & Intersection Results

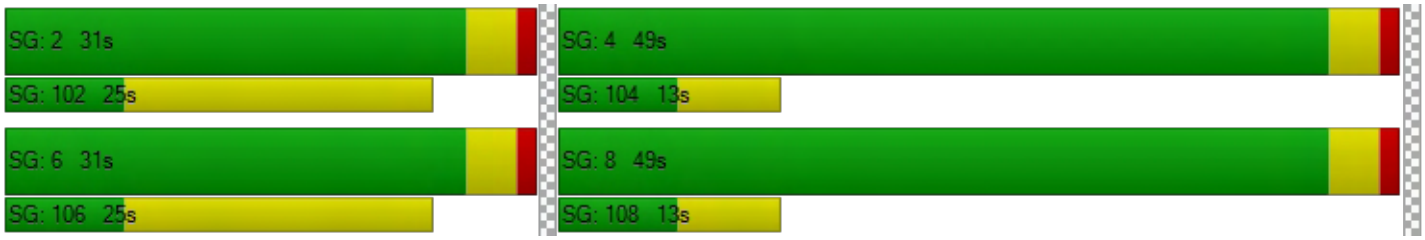
d_M, Delay for Movement [s/veh]	26.02	26.02	26.02	33.47	33.47	33.47	15.69	8.23	8.78	20.76	6.50	6.77
Movement LOS	C	C	C	C	C	C	B	A	A	C	A	A
d_A, Approach Delay [s/veh]	26.02			33.47			8.73			7.22		
Approach LOS	C			C			A			A		
d_I, Intersection Delay [s/veh]	11.40											
Intersection LOS	B											
Intersection V/C	0.629											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.014	2.341	3.083	3.150
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	675	675	1125	1125
d_b, Bicycle Delay [s]	17.56	17.56	7.66	7.66
l_b,int, Bicycle LOS Score for Intersection	1.855	2.159	2.660	2.253
Bicycle LOS	A	B	B	B

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 13: Gaviota Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	13.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.033

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	7	1	17	12	1	14	16	136	5	12	125	18
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	48	0	0	19	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	1	17	12	1	14	16	187	5	12	147	18
Peak Hour Factor	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	0	5	4	0	4	5	57	2	4	45	5
Total Analysis Volume [veh/h]	9	1	21	15	1	17	20	228	6	15	179	22
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.03	0.03	0.00	0.02	0.01	0.00	0.00	0.01	0.00	0.00
d_M, Delay for Movement [s/veh]	13.04	13.09	9.70	13.18	13.08	9.55	7.64	0.00	0.00	7.71	0.00	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.15	0.15	0.15	0.17	0.17	0.17	0.04	0.04	0.04	0.03	0.03	0.03
95th-Percentile Queue Length [ft/ln]	3.73	3.73	3.73	4.32	4.32	4.32	0.88	0.88	0.88	0.67	0.67	0.67
d_A, Approach Delay [s/veh]	10.78			11.31			0.60			0.54		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.83											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.746

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	1170	144	228	1250	109	155	916	128	93	656	368
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	43	5	0	28	0	0	2	4	2	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	108	1236	152	233	1303	111	158	936	135	97	670	375
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	309	38	58	326	28	40	234	34	24	168	94
Total Analysis Volume [veh/h]	108	1236	152	233	1303	111	158	936	135	97	670	375
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

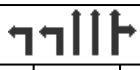
Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.29	0.29	0.07	0.29	0.29	0.10	0.22	0.22	0.06	0.16	0.16
Intersection LOS	C											
Intersection V/C	0.746											

Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.885

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	166	835	219	303	980	183	211	1292	132	318	990	175
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	28	43	13	20	1	0	15	0	27	29	28
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	169	880	266	322	1020	188	215	1333	135	351	1039	207
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	220	67	81	255	47	54	333	34	88	260	52
Total Analysis Volume [veh/h]	169	880	266	322	1020	188	215	1333	135	351	1039	207
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.18	0.06	0.10	0.25	0.25	0.07	0.31	0.31	0.11	0.26	0.26
Intersection LOS	D											
Intersection V/C	0.885											

Intersection Level Of Service Report
Intersection 16: Cherry Ave (NS) at Burnett St/Skyline Dr (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.643

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	0	0	0	1
Pocket Length [ft]	193.00	100.00	96.00	200.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	94.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	7	1064	31	132	1321	57	38	26	25	26	18	107
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	87	0	0	39	0	0	0	1	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	1172	32	135	1386	58	39	27	27	27	18	109
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	293	8	34	347	15	10	7	7	7	5	27
Total Analysis Volume [veh/h]	9	1172	32	135	1386	58	39	27	27	27	18	109
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.37	0.02	0.08	0.43	0.04	0.02	0.06	0.06	0.02	0.03	0.07
Intersection LOS	B											
Intersection V/C	0.643											

Intersection Level Of Service Report
Intersection 17: Cherry Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.672

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	0	0	0
Pocket Length [ft]	200.00	100.00	100.00	186.00	100.00	89.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	975	9	21	1214	135	112	2	66	5	2	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	41	0	0	21	19	48	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	1036	9	21	1259	157	162	2	67	5	2	10
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	259	2	5	315	39	41	1	17	1	1	3
Total Analysis Volume [veh/h]	50	1036	9	21	1259	157	162	2	67	5	2	10
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.32	0.01	0.01	0.39	0.10	0.10	0.14	0.14	0.00	0.01	0.01
Intersection LOS	B											
Intersection V/C	0.672											

Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.622

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	13	862	11	167	1071	44	55	35	13	7	16	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	24	0	3	14	4	12	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	903	11	173	1106	49	68	36	13	7	16	127
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	226	3	43	277	12	17	9	3	2	4	32
Total Analysis Volume [veh/h]	13	903	11	173	1106	49	68	36	13	7	16	127
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.28	0.01	0.11	0.35	0.03	0.04	0.07	0.01	0.00	0.09	0.09
Intersection LOS	B											
Intersection V/C	0.622											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.505

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	2	822	11	16	1054	16	21	6	24	15	6	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	19	0	3	11	0	0	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	857	11	19	1086	16	21	6	24	15	6	44
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	214	3	5	272	4	5	2	6	4	2	11
Total Analysis Volume [veh/h]	2	857	11	19	1086	16	21	6	24	15	6	44
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.27	0.27	0.01	0.34	0.34	0.01	0.02	0.02	0.01	0.04	0.04
Intersection LOS	A											
Intersection V/C	0.505											

Intersection Level Of Service Report
Intersection 20: Cherry Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	25.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.698

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	118.00	135.00	100.00	100.00	180.00	100.00	100.00	186.00	100.00	100.00
Speed [mph]	30.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	78	419	41	185	588	235	195	1413	78	72	891	170
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	5	0	8	3	0	0	30	7	0	26	14
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	82	432	42	197	603	240	199	1471	87	73	935	187
Peak Hour Factor	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	111	11	50	154	61	51	377	22	19	239	48
Total Analysis Volume [veh/h]	84	443	43	202	618	246	204	1507	89	75	958	192
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	77.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	29	0	11	29	0	13	29	0	11	27	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	0	0	0	12	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	16	16	27	17	17	11	35	35	6	30	30
g / C, Green / Cycle	0.34	0.21	0.21	0.34	0.22	0.22	0.14	0.44	0.44	0.07	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.08	0.13	0.13	0.17	0.17	0.15	0.11	0.30	0.30	0.04	0.22	0.22
s, saturation flow rate [veh/h]	1090	1870	1813	1197	3560	1589	1781	3560	1817	1781	3560	1715
c, Capacity [veh/h]	375	385	373	435	779	348	248	1545	789	129	1309	630
d1, Uniform Delay [s]	19.36	29.14	29.17	20.24	29.63	28.97	33.58	18.26	18.28	36.03	20.51	20.53
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.30	1.78	1.86	0.77	1.89	2.66	6.78	2.47	4.79	4.09	1.98	4.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.22	0.64	0.64	0.46	0.79	0.71	0.82	0.68	0.68	0.58	0.59	0.59
d, Delay for Lane Group [s/veh]	19.66	30.92	31.03	21.02	31.51	31.63	40.36	20.74	23.07	40.12	22.50	24.61
Lane Group LOS	B	C	C	C	C	C	D	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.07	4.39	4.28	2.77	5.63	4.48	4.17	7.63	8.31	1.52	5.78	5.96
50th-Percentile Queue Length [ft/ln]	26.64	109.65	107.12	69.18	140.71	111.98	104.15	190.69	207.73	38.01	144.61	148.88
95th-Percentile Queue Length [veh/ln]	1.92	7.82	7.68	4.98	9.52	7.95	7.50	12.16	13.04	2.74	9.73	9.96
95th-Percentile Queue Length [ft/ln]	47.95	195.51	191.99	124.52	237.98	198.75	187.47	303.92	325.92	68.42	243.22	248.93

Movement, Approach, & Intersection Results

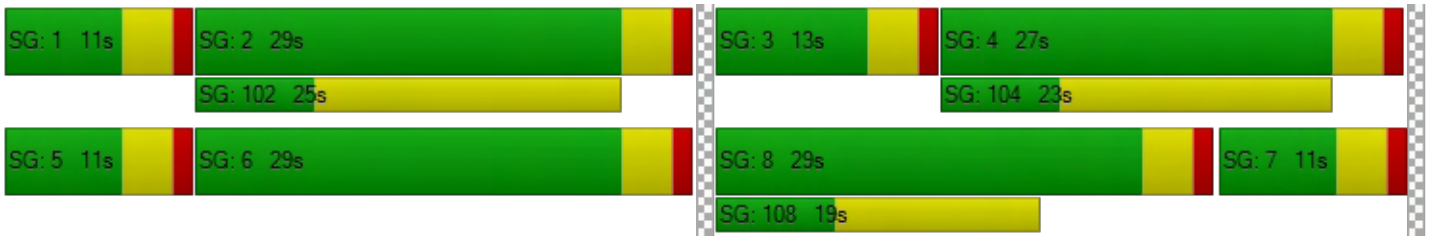
d_M, Delay for Movement [s/veh]	19.66	30.97	31.03	21.02	31.51	31.63	40.36	21.43	23.07	40.12	22.90	24.61
Movement LOS	B	C	C	C	C	C	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	29.31			29.55			23.66			24.22		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	25.85											
Intersection LOS	C											
Intersection V/C	0.698											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	0.00	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.557	2.756	0.000	3.137
Crosswalk LOS	B	C	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	625	625	625	575
d_b, Bicycle Delay [s]	18.91	18.91	18.91	20.31
l_b,int, Bicycle LOS Score for Intersection	2.030	2.439	2.550	2.233
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



General Plan Buildout Without Project

Signal Hill Business Park

Vistro File: G:\...\AM Base.vistro
Report File: G:\...\GP AM.pdf

Scenario 5 General Plan Buildout Without Project
7/3/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Orange Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Thru	0.950	-	E
2	Orange Ave (NS) at Willow St (EW)	Signalized	ICU 1	NB Thru	0.890	-	D
3	Orange Ave (NS) at Burnett St (EW)	Signalized	ICU 1	NB Thru	0.774	-	C
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Right	0.856	-	D
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.750	29.0	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.101	14.4	B
7	Walnut Ave (NS) at Spring St (EW)	Signalized	ICU 1	WB Right	0.737	-	C
8	Walnut Ave (NS) at Willow St (EW)	Signalized	ICU 1	WB Thru	0.602	-	B
9	Walnut Ave (NS) at Burnett St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.975	32.8	D
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.701	17.3	C
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	EB Right	0.619	-	B
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.978	13.5	B
13	Gaviota Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Thru	0.011	12.3	B
14	Cherry Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Thru	0.898	-	D
15	Cherry Ave (NS) at Willow St (EW)	Signalized	ICU 1	WB Thru	0.855	-	D
16	Cherry Ave (NS) at Burnett St/Skyline Dr (EW)	Signalized	ICU 1	NB Thru	0.746	-	C
17	Cherry Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Thru	0.708	-	C
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	NB Thru	0.784	-	C

19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	NB Thru	0.627	-	B
20	Cherry Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	WB Right	0.946	40.6	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Orange Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.950

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	160.00	75.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	28	579	57	99	518	130	88	610	65	107	942	141
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	16	8	19	11	0	0	8	0	4	2	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	722	78	140	643	159	107	752	79	135	1151	177
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	181	20	35	161	40	27	188	20	34	288	44
Total Analysis Volume [veh/h]	34	722	78	140	643	159	107	752	79	135	1151	177
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.23	0.05	0.09	0.40	0.10	0.07	0.24	0.05	0.08	0.36	0.11
Intersection LOS	E											
Intersection V/C	0.950											

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.890

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	82	492	92	40	439	83	84	931	72	69	1128	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	7	0	8	5	2	4	30	1	0	16	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	101	607	112	57	541	103	106	1166	89	84	1392	89
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	152	28	14	135	26	27	292	22	21	348	22
Total Analysis Volume [veh/h]	101	607	112	57	541	103	106	1166	89	84	1392	89
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.38	0.00	0.04	0.34	0.06	0.07	0.26	0.26	0.05	0.31	0.31
Intersection LOS	D											
Intersection V/C	0.890											

Intersection Level Of Service Report
Intersection 3: Orange Ave (NS) at Burnett St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.774

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	110.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	21	616	30	32	536	11	24	96	28	57	64	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	16	1	5	0	0	3	0	26	4	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	760	53	40	659	13	29	120	34	96	82	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	190	13	10	165	3	7	30	9	24	21	7
Total Analysis Volume [veh/h]	26	760	53	40	659	13	29	120	34	96	82	27
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.48	0.03	0.03	0.41	0.01	0.02	0.11	0.11	0.06	0.13	0.13
Intersection LOS	C											
Intersection V/C	0.774											

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.856

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	40	667	22	28	526	25	78	90	38	47	124	57
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	3	3	19	9	6	1	0	4	1	4
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	829	30	37	661	40	101	111	46	61	152	74
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	207	8	9	165	10	25	28	12	15	38	19
Total Analysis Volume [veh/h]	49	829	30	37	661	40	101	111	46	61	152	74
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.54	0.54	0.02	0.44	0.44	0.06	0.13	0.03	0.04	0.13	0.05
Intersection LOS	D											
Intersection V/C	0.856											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	29.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.750

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	511	198	53	345	101	104	864	67	239	1360	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	5	0	0	7	16	13	17	0	0	6	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	120	628	242	65	428	139	140	1071	82	292	1665	123
Peak Hour Factor	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	175	68	18	120	39	39	299	23	82	465	34
Total Analysis Volume [veh/h]	134	702	270	73	478	155	156	1197	92	326	1860	137
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	16	41	0	28	53	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	27	52	27	27	27	11	40	40	21	50	50
g / C, Green / Cycle	0.27	0.27	0.52	0.27	0.27	0.27	0.11	0.40	0.40	0.21	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.15	0.20	0.17	0.10	0.13	0.10	0.09	0.24	0.24	0.18	0.37	0.38
s, saturation flow rate [veh/h]	916	3560	1589	745	3560	1589	1781	3560	1802	1781	3560	1806
c, Capacity [veh/h]	198	962	820	125	962	429	189	1439	729	366	1794	910
d1, Uniform Delay [s]	43.52	33.18	14.13	47.39	30.77	29.51	43.82	23.36	23.36	38.63	19.55	19.69
k, delay calibration	0.11	0.11	0.13	0.11	0.11	0.11	0.11	0.50	0.50	0.16	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.99	1.08	0.28	4.23	0.40	0.51	8.87	1.82	3.55	10.79	2.73	5.50
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.68	0.73	0.33	0.58	0.50	0.36	0.83	0.59	0.59	0.89	0.74	0.74
d, Delay for Lane Group [s/veh]	47.51	34.26	14.41	51.62	31.16	30.02	52.69	25.18	26.92	49.42	22.28	25.19
Lane Group LOS	D	C	B	D	C	C	D	C	C	D	C	C
Critical Lane Group	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	3.49	7.65	3.43	1.96	4.85	3.05	4.18	7.93	8.38	8.66	11.85	12.94
50th-Percentile Queue Length [ft/ln]	87.29	191.24	85.75	49.12	121.37	76.20	104.55	198.26	209.52	216.58	296.21	323.48
95th-Percentile Queue Length [veh/ln]	6.28	12.19	6.17	3.54	8.47	5.49	7.53	12.55	13.13	13.49	17.49	18.84
95th-Percentile Queue Length [ft/ln]	157.12	304.64	154.35	88.41	211.70	137.16	188.19	313.72	328.22	337.26	437.34	470.96

Movement, Approach, & Intersection Results

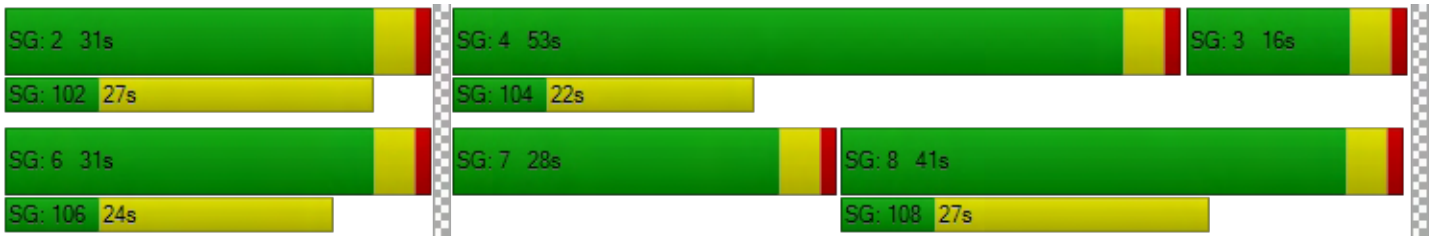
d_M, Delay for Movement [s/veh]	47.51	34.26	14.41	51.62	31.16	30.02	52.69	25.68	26.92	49.42	23.12	25.19
Movement LOS	D	C	B	D	C	C	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	31.02			33.03			28.67			26.94		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	28.97											
Intersection LOS	C											
Intersection V/C	0.750											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.837	2.734	3.373	3.330
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	540	540	740	980
d_b, Bicycle Delay [s]	26.65	26.65	19.85	13.01
l_b,int, Bicycle LOS Score for Intersection	2.472	2.142	2.354	2.837
Bicycle LOS	B	B	B	C

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	14.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.101

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	16	6	120	5	5	228
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	9	0	0	7	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	29	7	146	13	6	278
Peak Hour Factor	0.6710	0.6710	0.6710	0.6710	0.6710	0.6710
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	3	54	5	2	104
Total Analysis Volume [veh/h]	43	10	218	19	9	414
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.01	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	14.39	10.38	0.00	0.00	7.70	0.00
Movement LOS	B	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.38	0.38	0.00	0.00	0.01	0.01
95th-Percentile Queue Length [ft/ln]	9.47	9.47	0.00	0.00	0.34	0.34
d_A, Approach Delay [s/veh]	13.63		0.00		0.16	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	1.11					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 7: Walnut Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.737

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	102.00	100.00	100.00	98.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	90	102	62	29	119	46	31	635	55	102	1052	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	2	0	0	1	0	0	9	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	126	76	35	146	56	38	784	67	124	1286	52
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	32	19	9	37	14	10	196	17	31	322	13
Total Analysis Volume [veh/h]	110	126	76	35	146	56	38	784	67	124	1286	52
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.08	0.05	0.02	0.13	0.13	0.02	0.27	0.27	0.08	0.42	0.42
Intersection LOS	C											
Intersection V/C	0.737											

Intersection Level Of Service Report
Intersection 8: Walnut Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.602

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	106.00	100.00	100.00	100.00	100.00	100.00	204.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	158	160	39	106	32	32	982	41	50	1199	69
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	22	2	5	0	1	0	0	24	14	3	7	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	84	195	200	48	130	39	39	1222	64	64	1470	84
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	49	50	12	33	10	10	306	16	16	368	21
Total Analysis Volume [veh/h]	84	195	200	48	130	39	39	1222	64	64	1470	84
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.12	0.12	0.03	0.04	0.02	0.02	0.27	0.27	0.04	0.32	0.32
Intersection LOS	B											
Intersection V/C	0.602											

Intersection Level Of Service Report
Intersection 9: Walnut Ave (NS) at Burnett St (EW)

Control Type:	All-way stop	Delay (sec / veh):	32.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.975

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	44	281	25	10	140	40	37	43	60	41	84	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	2	3	1	2	4	1	18	1	4	26	1
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	54	345	34	13	173	53	46	70	74	54	128	21
Peak Hour Factor	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	107	11	4	54	16	14	22	23	17	40	7
Total Analysis Volume [veh/h]	67	429	42	16	215	66	57	87	92	67	159	26
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	508	573	473	526	497	491
Degree of Utilization, x	0.98	0.07	0.49	0.13	0.47	0.51

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	12.87	0.24	2.63	0.43	2.52	2.89
95th-Percentile Queue Length [ft]	321.87	5.92	65.84	10.69	62.91	72.29
Approach Delay [s/veh]	56.27		15.84		16.61	17.85
Approach LOS	F		C		C	C
Intersection Delay [s/veh]	32.80					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	17.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.701

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	22	207	8	48	131	137	21	77	26	23	70	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	5	6	0	5	0	0	0	0	3	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	258	16	59	165	167	26	94	32	31	85	43
Peak Hour Factor	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	85	5	19	54	55	9	31	11	10	28	14
Total Analysis Volume [veh/h]	36	340	21	78	217	220	34	124	42	41	112	57
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	567	525	600	518	523
Degree of Utilization, x	0.70	0.56	0.37	0.39	0.40

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	5.56	3.43	1.68	1.81	1.92
95th-Percentile Queue Length [ft]	139.04	85.79	41.95	45.14	48.02
Approach Delay [s/veh]	22.87	15.47		14.26	14.44
Approach LOS	C	C		B	B
Intersection Delay [s/veh]	17.34				
Intersection LOS	C				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.619

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	167	44	34	125	44	64	107	82	47	105	25
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	0	9	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	210	54	41	162	54	78	131	100	57	128	31
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	53	14	10	41	14	20	33	25	14	32	8
Total Analysis Volume [veh/h]	60	210	54	41	162	54	78	131	100	57	128	31
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.17	0.17	0.03	0.14	0.14	0.05	0.19	0.19	0.04	0.14	0.14
Intersection LOS	B											
Intersection V/C	0.619											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	13.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.978

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	101	43	38	45	106	89	1032	83	34	1618	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	4	0	3	6	0	0	17	0	0	6	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	62	127	52	49	61	129	109	1276	101	41	1980	112
Peak Hour Factor	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	34	14	13	16	35	29	345	27	11	535	30
Total Analysis Volume [veh/h]	67	137	56	53	66	139	118	1379	109	44	2141	121
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	57.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	29	0	0	29	0	0	71	0	0	71	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	71	71	71	71	71	71
g / C, Green / Cycle	0.21	0.21	0.71	0.71	0.71	0.71	0.71	0.71
(v / s)_i Volume / Saturation Flow Rate	0.19	0.18	0.71	0.28	0.28	0.12	0.42	0.42
s, saturation flow rate [veh/h]	1366	1442	166	3560	1801	354	3560	1819
c, Capacity [veh/h]	333	347	152	2526	1277	278	2526	1291
d1, Uniform Delay [s]	37.94	37.41	33.62	5.84	5.84	10.02	7.27	7.31
k, delay calibration	0.18	0.15	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.58	4.46	31.22	0.46	0.90	1.22	1.02	2.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.78	0.74	0.78	0.39	0.39	0.16	0.59	0.60
d, Delay for Lane Group [s/veh]	44.52	41.87	64.85	6.30	6.75	11.24	8.29	9.35
Lane Group LOS	D	D	E	A	A	B	A	A
Critical Lane Group	Yes	No	Yes	No	No	No	No	No
50th-Percentile Queue Length [veh/ln]	6.72	6.38	4.26	3.71	3.91	0.53	7.03	7.66
50th-Percentile Queue Length [ft/ln]	167.96	159.45	106.40	92.76	97.83	13.35	175.71	191.38
95th-Percentile Queue Length [veh/ln]	10.97	10.52	7.64	6.68	7.04	0.96	11.38	12.19
95th-Percentile Queue Length [ft/ln]	274.23	262.99	190.98	166.98	176.10	24.02	284.41	304.82

Movement, Approach, & Intersection Results

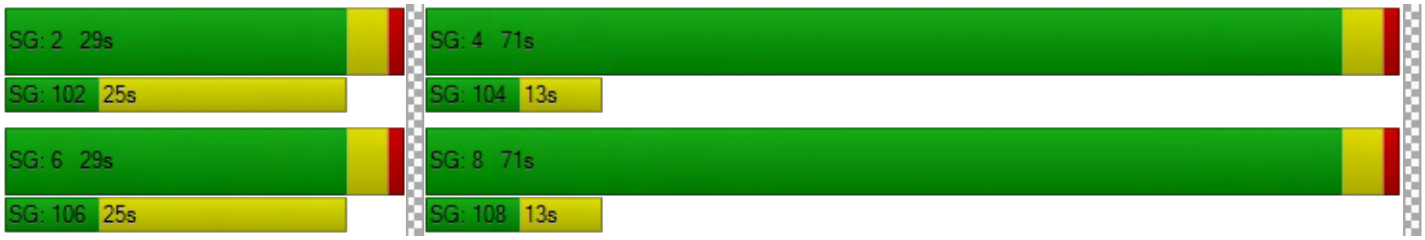
d_M, Delay for Movement [s/veh]	44.52	44.52	44.52	41.87	41.87	41.87	64.85	6.43	6.75	11.24	8.61	9.35
Movement LOS	D	D	D	D	D	D	E	A	A	B	A	A
d_A, Approach Delay [s/veh]	44.52			41.87			10.74			8.70		
Approach LOS	D			D			B			A		
d_I, Intersection Delay [s/veh]	13.47											
Intersection LOS	B											
Intersection V/C	0.978											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.016	2.319	3.245	3.203
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	500	500	1340	1340
d_b, Bicycle Delay [s]	28.13	28.13	5.45	5.45
l_b,int, Bicycle LOS Score for Intersection	1.989	1.985	2.443	2.828
Bicycle LOS	A	A	B	C

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 13: Gaviota Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	12.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	16	4	16	18	1	12	3	115	12	15	97	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	6	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	5	20	22	1	15	4	146	15	18	121	6
Peak Hour Factor	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	2	6	7	0	5	1	45	5	6	37	2
Total Analysis Volume [veh/h]	25	6	25	27	1	19	5	180	19	22	150	7
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.01	0.03	0.05	0.00	0.02	0.00	0.00	0.00	0.02	0.00	0.00
d_M, Delay for Movement [s/veh]	12.24	12.33	9.73	12.33	12.31	9.47	7.52	0.00	0.00	7.64	0.00	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.29	0.29	0.29	0.24	0.24	0.24	0.01	0.01	0.01	0.04	0.04	0.04
95th-Percentile Queue Length [ft/ln]	7.13	7.13	7.13	6.02	6.02	6.02	0.21	0.21	0.21	0.99	0.99	0.99
d_A, Approach Delay [s/veh]	11.13			11.17			0.18			0.94		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	2.79											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.898

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	86	1069	170	281	1098	137	120	544	75	105	1052	358
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	18	0	0	27	0	0	1	8	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	107	1322	207	343	1367	167	146	665	100	128	1284	437
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	331	52	86	342	42	37	166	25	32	321	109
Total Analysis Volume [veh/h]	107	1322	207	343	1367	167	146	665	100	128	1284	437
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

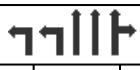
Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.32	0.32	0.11	0.32	0.32	0.09	0.16	0.16	0.08	0.27	0.27
Intersection LOS	D											
Intersection V/C	0.898											

Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.855

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	167	1031	161	149	765	147	177	836	85	231	1124	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	11	15	28	7	0	1	28	0	9	10	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	204	1269	211	210	940	179	217	1048	104	291	1381	150
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	317	53	53	235	45	54	262	26	73	345	38
Total Analysis Volume [veh/h]	204	1269	211	210	940	179	217	1048	104	291	1381	150
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.26	0.04	0.07	0.23	0.23	0.07	0.24	0.24	0.09	0.32	0.32
Intersection LOS	D											
Intersection V/C	0.855											

Intersection Level Of Service Report
Intersection 16: Cherry Ave (NS) at Burnett St/Skyline Dr (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.746

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	0	0	0	1
Pocket Length [ft]	193.00	100.00	96.00	200.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	94.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	34	1301	17	52	919	65	21	26	11	12	36	115
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	23	0	0	25	0	0	0	1	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	42	1610	21	63	1146	79	26	32	14	15	44	140
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	403	5	16	287	20	7	8	4	4	11	35
Total Analysis Volume [veh/h]	42	1610	21	63	1146	79	26	32	14	15	44	140
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.50	0.01	0.04	0.36	0.05	0.02	0.05	0.05	0.01	0.04	0.09
Intersection LOS	C											
Intersection V/C	0.746											

Intersection Level Of Service Report
Intersection 17: Cherry Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.708

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	0	0	0
Pocket Length [ft]	200.00	100.00	100.00	186.00	100.00	89.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	41	1200	4	11	844	88	112	1	55	6	3	23
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	18	0	0	23	3	6	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	1482	5	13	1053	110	143	1	67	7	4	28
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	371	1	3	263	28	36	0	17	2	1	7
Total Analysis Volume [veh/h]	50	1482	5	13	1053	110	143	1	67	7	4	28
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.46	0.00	0.01	0.33	0.07	0.09	0.13	0.13	0.00	0.02	0.02
Intersection LOS	C											
Intersection V/C	0.708											

Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.784

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	1035	10	62	763	88	79	47	62	11	77	150
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	0	4	19	0	0	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	1278	12	80	950	107	96	57	76	13	94	186
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	320	3	20	238	27	24	14	19	3	24	47
Total Analysis Volume [veh/h]	60	1278	12	80	950	107	96	57	76	13	94	186
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.40	0.01	0.05	0.30	0.07	0.06	0.10	0.05	0.01	0.18	0.18
Intersection LOS	C											
Intersection V/C	0.784											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.627

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	18	890	14	7	844	34	75	9	109	26	15	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	12	0	4	15	0	0	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	1098	17	13	1045	41	92	11	133	32	18	79
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	275	4	3	261	10	23	3	33	8	5	20
Total Analysis Volume [veh/h]	22	1098	17	13	1045	41	92	11	133	32	18	79
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.35	0.35	0.01	0.34	0.34	0.06	0.09	0.09	0.02	0.08	0.08
Intersection LOS	B											
Intersection V/C	0.627											

Intersection Level Of Service Report
Intersection 20: Cherry Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	40.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.946

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	118.00	135.00	100.00	100.00	180.00	100.00	100.00	186.00	100.00	100.00
Speed [mph]	30.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	78	565	22	129	432	256	190	919	65	34	1309	204
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	0	11	4	0	0	20	0	0	8	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	95	692	27	168	531	312	232	1141	79	41	1605	258
Peak Hour Factor	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	184	7	45	141	83	62	303	21	11	426	68
Total Analysis Volume [veh/h]	101	735	29	178	564	331	246	1211	84	44	1704	274
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	6.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	29	0	11	29	0	18	49	0	11	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	0	0	0	12	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	34	23	23	34	23	23	16	49	49	5	39	39
g / C, Green / Cycle	0.34	0.23	0.23	0.34	0.23	0.23	0.16	0.49	0.49	0.05	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.09	0.21	0.21	0.18	0.16	0.21	0.14	0.24	0.24	0.02	0.37	0.38
s, saturation flow rate [veh/h]	1085	1870	1845	991	3560	1589	1781	3560	1809	1781	3560	1741
c, Capacity [veh/h]	345	425	420	299	824	368	278	1753	890	89	1375	672
d1, Uniform Delay [s]	24.59	37.60	37.60	27.08	35.11	37.32	41.34	16.99	16.99	46.30	30.01	30.20
k, delay calibration	0.11	0.22	0.22	0.16	0.11	0.23	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.47	13.43	13.60	2.74	1.01	14.90	9.12	0.98	1.93	4.20	16.88	28.65
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.29	0.90	0.90	0.60	0.68	0.90	0.88	0.49	0.49	0.49	0.96	0.97
d, Delay for Lane Group [s/veh]	25.05	51.03	51.20	29.82	36.12	52.22	50.46	17.97	18.92	50.50	46.89	58.84
Lane Group LOS	C	D	D	C	D	D	D	B	B	D	D	E
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.70	10.57	10.45	3.29	6.30	9.23	6.51	6.47	6.80	1.15	17.93	19.98
50th-Percentile Queue Length [ft/ln]	42.60	264.28	261.29	82.31	157.41	230.86	162.79	161.69	170.12	28.87	448.29	499.40
95th-Percentile Queue Length [veh/ln]	3.07	15.90	15.75	5.93	10.41	14.22	10.70	10.64	11.08	2.08	24.88	27.31
95th-Percentile Queue Length [ft/ln]	76.69	397.58	393.84	148.16	260.29	355.45	267.41	265.96	277.07	51.96	621.91	682.65

Movement, Approach, & Intersection Results

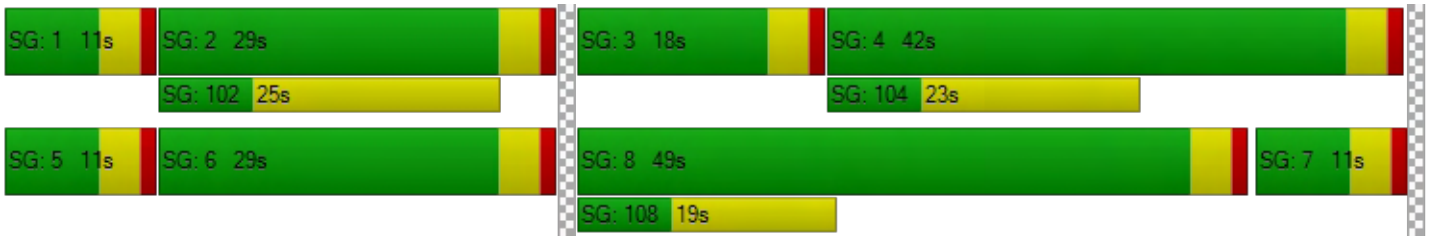
d_M, Delay for Movement [s/veh]	25.05	51.11	51.20	29.82	36.12	52.22	50.46	18.25	18.92	50.50	49.56	58.84
Movement LOS	C	D	D	C	D	D	D	B	B	D	D	E
d_A, Approach Delay [s/veh]	48.07			40.04			23.43			50.83		
Approach LOS	D			D			C			D		
d_I, Intersection Delay [s/veh]	40.62											
Intersection LOS	D											
Intersection V/C	0.946											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	0.00	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.608	2.836	0.000	3.221
Crosswalk LOS	B	C	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	500	500	900	760
d_b, Bicycle Delay [s]	28.13	28.13	15.13	19.22
l_b,int, Bicycle LOS Score for Intersection	2.273	2.445	2.407	2.672
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Signal Hill Business Park

Vistro File: G:\...\PM Base.vistro
Report File: G:\...\GP PM.pdf

Scenario 5 General Plan Buildout Without Project
7/3/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Orange Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Thru	0.988	-	E
2	Orange Ave (NS) at Willow St (EW)	Signalized	ICU 1	EB Thru	1.020	-	F
3	Orange Ave (NS) at Burnett St (EW)	Signalized	ICU 1	SB Thru	0.738	-	C
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	SB Thru	0.771	-	C
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.758	27.4	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.026	11.9	B
7	Walnut Ave (NS) at Spring St (EW)	Signalized	ICU 1	EB Thru	0.780	-	C
8	Walnut Ave (NS) at Willow St (EW)	Signalized	ICU 1	EB Thru	0.785	-	C
9	Walnut Ave (NS) at Burnett St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.786	22.2	C
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	SB Thru	0.619	16.0	C
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	NB Thru	0.563	-	A
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	SB Thru	0.715	12.9	B
13	Gaviota Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	SB Left	0.040	13.4	B
14	Cherry Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Right	0.868	-	D
15	Cherry Ave (NS) at Willow St (EW)	Signalized	ICU 1	EB Thru	1.030	-	F
16	Cherry Ave (NS) at Burnett St/Skyline Dr (EW)	Signalized	ICU 1	SB Thru	0.727	-	C
17	Cherry Ave (NS) at Hill St (EW)	Signalized	ICU 1	SB Thru	0.748	-	C
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	SB Thru	0.714	-	C

19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	SB Right	0.583	-	A
20	Cherry Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	WB Left	0.800	31.3	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Orange Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.988

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	160.00	75.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	58	586	58	102	564	190	129	935	54	50	662	160
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	12	6	13	18	0	0	4	0	10	8	20
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	71	727	77	137	706	232	157	1145	66	71	816	215
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	182	19	34	177	58	39	286	17	18	204	54
Total Analysis Volume [veh/h]	71	727	77	137	706	232	157	1145	66	71	816	215
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.23	0.05	0.09	0.44	0.15	0.10	0.36	0.04	0.04	0.26	0.13
Intersection LOS	E											
Intersection V/C	0.988											

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.020

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	460	101	73	500	67	89	1451	74	135	1077	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	7	0	16	7	5	3	22	1	0	29	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	63	568	123	105	617	87	112	1792	91	165	1343	107
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	142	31	26	154	22	28	448	23	41	336	27
Total Analysis Volume [veh/h]	63	568	123	105	617	87	112	1792	91	165	1343	107
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.36	0.00	0.07	0.39	0.05	0.07	0.39	0.39	0.10	0.30	0.30
Intersection LOS	F											
Intersection V/C	1.020											

Intersection Level Of Service Report
Intersection 3: Orange Ave (NS) at Burnett St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.738

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	110.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	10	552	35	26	649	29	17	47	20	40	66	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	31	0	8	0	0	5	0	15	3	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	679	74	32	800	35	21	62	24	64	84	39
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	170	19	8	200	9	5	16	6	16	21	10
Total Analysis Volume [veh/h]	12	679	74	32	800	35	21	62	24	64	84	39
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.42	0.05	0.02	0.50	0.02	0.01	0.07	0.07	0.04	0.12	0.12
Intersection LOS	C											
Intersection V/C	0.738											

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.771

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	31	563	33	27	592	43	36	107	30	42	103	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	3	16	5	11	1	0	3	1	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	710	43	36	738	57	55	132	37	54	127	44
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	178	11	9	185	14	14	33	9	14	32	11
Total Analysis Volume [veh/h]	38	710	43	36	738	57	55	132	37	54	127	44
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.47	0.47	0.02	0.50	0.50	0.03	0.12	0.02	0.03	0.11	0.03
Intersection LOS	C											
Intersection V/C	0.771											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	27.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.758

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	73	495	277	80	499	97	84	1383	105	183	879	79
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	0	0	6	13	18	10	0	0	17	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	612	338	98	615	131	120	1697	128	223	1089	96
Peak Hour Factor	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	157	87	25	158	34	31	435	33	57	279	25
Total Analysis Volume [veh/h]	91	627	346	100	630	134	123	1739	131	228	1116	98
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	13	41	0	18	46	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	27	45	27	27	27	8	37	37	14	43	43
g / C, Green / Cycle	0.30	0.30	0.50	0.30	0.30	0.30	0.09	0.41	0.41	0.16	0.48	0.48
(v / s)_i Volume / Saturation Flow Rate	0.11	0.18	0.22	0.13	0.18	0.08	0.07	0.35	0.35	0.13	0.23	0.23
s, saturation flow rate [veh/h]	796	3560	1589	798	3560	1589	1781	3560	1804	1781	3560	1794
c, Capacity [veh/h]	181	1068	794	182	1068	477	156	1467	743	276	1706	860
d1, Uniform Delay [s]	38.75	26.79	14.44	39.16	26.82	24.11	40.28	23.90	23.96	36.89	15.80	15.80
k, delay calibration	0.11	0.11	0.20	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.15	0.52	0.69	2.57	0.52	0.32	8.49	6.15	11.63	6.21	0.94	1.87
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.50	0.59	0.44	0.55	0.59	0.28	0.79	0.84	0.85	0.83	0.47	0.47
d, Delay for Lane Group [s/veh]	40.90	27.31	15.12	41.73	27.34	24.43	48.77	30.05	35.59	43.10	16.74	17.67
Lane Group LOS	D	C	B	D	C	C	D	C	D	D	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.03	5.56	4.31	2.29	5.67	2.18	2.98	12.28	13.66	5.19	5.39	5.65
50th-Percentile Queue Length [ft/ln]	50.80	138.89	107.81	57.35	141.87	54.56	74.38	307.06	341.46	129.70	134.77	141.29
95th-Percentile Queue Length [veh/ln]	3.66	9.42	7.72	4.13	9.58	3.93	5.36	18.03	19.72	8.92	9.20	9.55
95th-Percentile Queue Length [ft/ln]	91.44	235.53	192.95	103.23	239.55	98.21	133.88	450.75	492.98	223.09	229.96	238.76

Movement, Approach, & Intersection Results

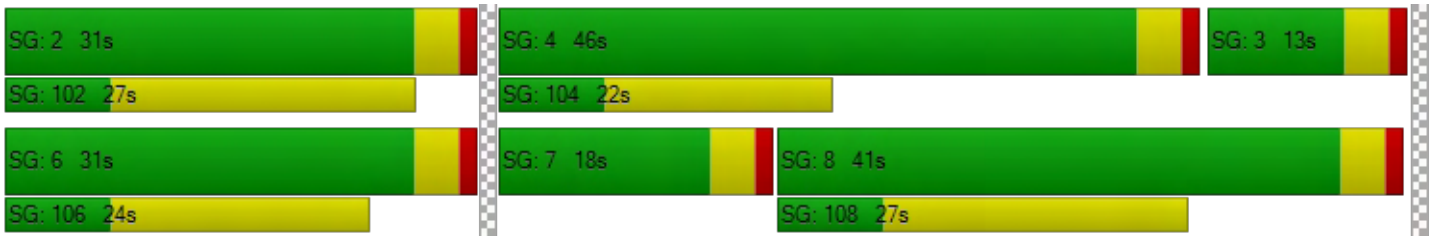
d_M, Delay for Movement [s/veh]	40.90	27.31	15.12	41.73	27.34	24.43	48.77	31.64	35.59	43.10	17.00	17.67
Movement LOS	D	C	B	D	C	C	D	C	D	D	B	B
d_A, Approach Delay [s/veh]	24.51			28.56			32.96			21.17		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	27.40											
Intersection LOS	C											
Intersection V/C	0.758											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.842	2.731	3.265	3.325
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	600	600	822	933
d_b, Bicycle Delay [s]	22.05	22.05	15.61	12.80
l_b,int, Bicycle LOS Score for Intersection	2.437	2.272	2.656	2.353
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	11.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.026

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	4	6	146	4	4	179
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	7	0	0	7	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	7	178	12	5	218
Peak Hour Factor	0.8490	0.8490	0.8490	0.8490	0.8490	0.8490
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	2	52	4	1	64
Total Analysis Volume [veh/h]	14	8	210	14	6	257
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	11.87	9.56	0.00	0.00	7.67	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.11	0.11	0.00	0.00	0.01	0.01
95th-Percentile Queue Length [ft/ln]	2.76	2.76	0.00	0.00	0.28	0.28
d_A, Approach Delay [s/veh]	11.03		0.00		0.17	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.57					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 7: Walnut Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.780

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	102.00	100.00	100.00	98.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	106	214	137	42	109	29	73	1046	91	65	738	66
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	1	0	0	6	0	0	9	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	129	262	167	51	134	35	89	1282	111	79	909	81
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	66	42	13	34	9	22	321	28	20	227	20
Total Analysis Volume [veh/h]	129	262	167	51	134	35	89	1282	111	79	909	81
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.16	0.10	0.03	0.11	0.11	0.06	0.44	0.44	0.05	0.31	0.31
Intersection LOS	C											
Intersection V/C	0.780											

Intersection Level Of Service Report
Intersection 8: Walnut Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.785

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	106.00	100.00	100.00	100.00	100.00	100.00	204.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	61	179	183	80	152	51	49	1520	56	94	1168	60
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	13	1	4	0	1	0	0	11	27	6	24	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	87	219	227	98	186	62	60	1865	95	121	1449	73
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	55	57	25	47	16	15	466	24	30	362	18
Total Analysis Volume [veh/h]	87	219	227	98	186	62	60	1865	95	121	1449	73
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.14	0.14	0.06	0.06	0.04	0.04	0.41	0.41	0.08	0.32	0.32
Intersection LOS	C											
Intersection V/C	0.785											

Intersection Level Of Service Report
Intersection 9: Walnut Ave (NS) at Burnett St (EW)

Control Type:	All-way stop	Delay (sec / veh):	22.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.786

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	15	298	21	22	253	22	53	76	15	21	64	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	2	5	1	1	2	4	32	0	3	16	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	366	31	28	310	29	69	125	18	29	94	18
Peak Hour Factor	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	100	8	8	85	8	19	34	5	8	26	5
Total Analysis Volume [veh/h]	22	399	34	31	338	32	75	136	20	32	103	20
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	536	603	527	593	516	500
Degree of Utilization, x	0.79	0.06	0.70	0.05	0.45	0.31

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	7.29	0.18	5.48	0.17	2.29	1.31
95th-Percentile Queue Length [ft]	182.24	4.47	136.89	4.26	57.14	32.76
Approach Delay [s/veh]	28.19		22.72		15.51	13.42
Approach LOS	D		C		C	B
Intersection Delay [s/veh]	22.22					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	16.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.619

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	23	201	22	34	217	57	34	100	21	21	96	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	2	0	4	0	0	0	0	3	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	251	29	41	269	70	41	122	26	29	117	40
Peak Hour Factor	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	69	8	11	74	19	11	33	7	8	32	11
Total Analysis Volume [veh/h]	31	275	32	45	294	77	45	133	28	32	128	44
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	583	548	622	544	548
Degree of Utilization, x	0.58	0.62	0.12	0.38	0.37

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.69	4.19	0.42	1.76	1.71
95th-Percentile Queue Length [ft]	92.31	104.83	10.53	43.89	42.76
Approach Delay [s/veh]	17.34	17.48		13.59	13.41
Approach LOS	C	C		B	B
Intersection Delay [s/veh]	16.04				
Intersection LOS	C				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.563

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	26	199	44	28	193	31	47	83	29	39	37	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	0	0	6	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	251	54	34	241	38	57	101	35	48	45	26
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	63	14	9	60	10	14	25	9	12	11	7
Total Analysis Volume [veh/h]	32	251	54	34	241	38	57	101	35	48	45	26
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.19	0.19	0.02	0.17	0.17	0.04	0.12	0.12	0.03	0.07	0.07
Intersection LOS	A											
Intersection V/C	0.563											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	12.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.715

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	25	106	29	51	134	84	107	1682	54	58	1030	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	2	4	0	0	10	0	0	17	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	135	35	64	167	102	131	2062	66	71	1274	76
Peak Hour Factor	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	35	9	17	44	27	34	541	17	19	335	20
Total Analysis Volume [veh/h]	33	142	37	67	175	107	138	2166	69	75	1338	80
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	45.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	30	0	0	30	0	0	60	0	0	60	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	61	61	61	61	61	61
g / C, Green / Cycle	0.23	0.23	0.68	0.68	0.68	0.68	0.68	0.68
(v / s)_i Volume / Saturation Flow Rate	0.13	0.21	0.36	0.41	0.42	0.44	0.26	0.26
s, saturation flow rate [veh/h]	1599	1643	379	3560	1841	171	3560	1816
c, Capacity [veh/h]	417	429	285	2417	1250	153	2417	1233
d1, Uniform Delay [s]	30.04	33.47	14.88	7.90	7.93	26.09	6.30	6.30
k, delay calibration	0.11	0.18	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.96	6.24	5.78	1.15	2.24	10.73	0.47	0.92
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.51	0.81	0.48	0.61	0.61	0.49	0.39	0.39
d, Delay for Lane Group [s/veh]	30.99	39.71	20.67	9.05	10.17	36.82	6.77	7.22
Lane Group LOS	C	D	C	A	B	D	A	A
Critical Lane Group	No	Yes	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.02	7.95	2.32	6.84	7.52	1.98	3.44	3.67
50th-Percentile Queue Length [ft/ln]	100.54	198.75	58.07	170.92	187.99	49.50	86.09	91.71
95th-Percentile Queue Length [veh/ln]	7.24	12.57	4.18	11.13	12.02	3.56	6.20	6.60
95th-Percentile Queue Length [ft/ln]	180.98	314.35	104.52	278.13	300.42	89.09	154.96	165.09

Movement, Approach, & Intersection Results

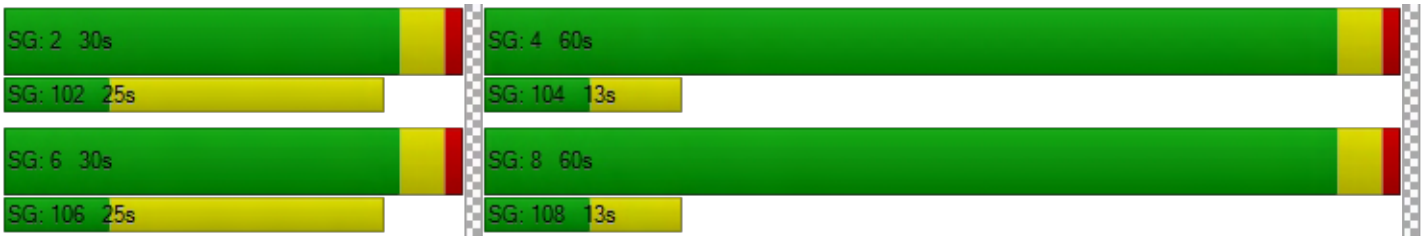
d_M, Delay for Movement [s/veh]	30.99	30.99	30.99	39.71	39.71	39.71	20.67	9.41	10.17	36.82	6.90	7.22
Movement LOS	C	C	C	D	D	D	C	A	B	D	A	A
d_A, Approach Delay [s/veh]	30.99			39.71			10.09			8.42		
Approach LOS	C			D			B			A		
d_I, Intersection Delay [s/veh]	12.86											
Intersection LOS	B											
Intersection V/C	0.715											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.080	2.366	3.177	3.213
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	578	578	1244	1244
d_b, Bicycle Delay [s]	22.76	22.76	6.42	6.42
l_b,int, Bicycle LOS Score for Intersection	1.909	2.135	2.865	2.381
Bicycle LOS	A	B	C	B

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 13: Gaviota Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	13.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.040

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	7	1	17	12	1	14	16	136	5	12	125	18
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	2	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	1	21	15	1	17	20	168	6	15	156	22
Peak Hour Factor	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	0	6	5	0	5	6	51	2	5	48	7
Total Analysis Volume [veh/h]	11	1	26	18	1	21	24	205	7	18	190	27
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.03	0.04	0.00	0.02	0.02	0.00	0.00	0.01	0.00	0.00
d_M, Delay for Movement [s/veh]	13.26	13.27	9.63	13.44	13.27	9.71	7.69	0.00	0.00	7.66	0.00	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.18	0.18	0.18	0.22	0.22	0.22	0.04	0.04	0.04	0.03	0.03	0.03
95th-Percentile Queue Length [ft/ln]	4.56	4.56	4.56	5.38	5.38	5.38	1.12	1.12	1.12	0.83	0.83	0.83
d_A, Approach Delay [s/veh]	10.78			11.48			0.78			0.59		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	2.17											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.868

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	1170	144	228	1250	109	155	916	128	93	656	368
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	26	0	0	23	0	0	2	4	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	128	1453	176	278	1548	133	189	1120	160	113	801	449
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	363	44	70	387	33	47	280	40	28	200	112
Total Analysis Volume [veh/h]	128	1453	176	278	1548	133	189	1120	160	113	801	449
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

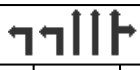
Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.34	0.34	0.09	0.35	0.35	0.12	0.27	0.27	0.07	0.20	0.20
Intersection LOS	D											
Intersection V/C	0.868											

Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.030

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	166	835	219	303	980	183	211	1292	132	318	990	175
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	7	13	13	1	0	15	0	14	29	28
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	203	1025	274	383	1209	224	257	1591	161	402	1237	242
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	256	69	96	302	56	64	398	40	101	309	61
Total Analysis Volume [veh/h]	203	1025	274	383	1209	224	257	1591	161	402	1237	242
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.21	0.05	0.12	0.30	0.30	0.08	0.37	0.37	0.13	0.31	0.31
Intersection LOS	F											
Intersection V/C	1.030											

Intersection Level Of Service Report
Intersection 16: Cherry Ave (NS) at Burnett St/Skyline Dr (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.727

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	0	0	0	1
Pocket Length [ft]	193.00	100.00	96.00	200.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	94.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	7	1064	31	132	1321	57	38	26	25	26	18	107
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	29	0	0	19	0	0	0	1	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	1327	38	161	1631	70	46	32	32	32	22	131
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	332	10	40	408	18	12	8	8	8	6	33
Total Analysis Volume [veh/h]	11	1327	38	161	1631	70	46	32	32	32	22	131
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.41	0.02	0.10	0.51	0.04	0.03	0.07	0.07	0.02	0.04	0.08
Intersection LOS	C											
Intersection V/C	0.727											

Intersection Level Of Service Report
Intersection 17: Cherry Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.748

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	0	0	0
Pocket Length [ft]	200.00	100.00	100.00	186.00	100.00	89.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	975	9	21	1214	135	112	2	66	5	2	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	29	0	0	17	3	2	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	1219	11	26	1498	168	139	2	81	6	2	12
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	305	3	7	375	42	35	1	20	2	1	3
Total Analysis Volume [veh/h]	60	1219	11	26	1498	168	139	2	81	6	2	12
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.38	0.01	0.02	0.47	0.11	0.09	0.14	0.14	0.00	0.01	0.01
Intersection LOS	C											
Intersection V/C	0.748											

Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.714

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	13	862	11	167	1071	44	55	35	13	7	16	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	24	0	3	14	0	0	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	1076	13	207	1321	54	67	43	16	9	20	151
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	269	3	52	330	14	17	11	4	2	5	38
Total Analysis Volume [veh/h]	16	1076	13	207	1321	54	67	43	16	9	20	151
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.34	0.01	0.13	0.41	0.03	0.04	0.07	0.01	0.01	0.11	0.11
Intersection LOS	C											
Intersection V/C	0.714											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.583

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	2	822	11	16	1054	16	21	6	24	15	6	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	19	0	3	11	0	0	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	1022	13	23	1297	20	26	7	29	18	7	51
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	256	3	6	324	5	7	2	7	5	2	13
Total Analysis Volume [veh/h]	2	1022	13	23	1297	20	26	7	29	18	7	51
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.32	0.32	0.01	0.41	0.41	0.02	0.02	0.02	0.01	0.05	0.05
Intersection LOS	A											
Intersection V/C	0.583											

Intersection Level Of Service Report
Intersection 20: Cherry Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	31.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.800

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	118.00	135.00	100.00	100.00	180.00	100.00	100.00	186.00	100.00	100.00
Speed [mph]	30.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	78	419	41	185	588	235	195	1413	78	72	891	170
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	5	0	8	3	0	0	12	0	0	19	14
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	95	516	50	234	720	287	238	1736	95	88	1106	221
Peak Hour Factor	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	132	13	60	184	74	61	445	24	23	283	57
Total Analysis Volume [veh/h]	97	529	51	240	738	294	244	1779	97	90	1133	226
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	1.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	29	0	11	29	0	19	39	0	11	31	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	0	0	0	12	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	32	21	21	32	22	22	14	39	39	6	31	31
g / C, Green / Cycle	0.36	0.24	0.24	0.36	0.24	0.24	0.16	0.44	0.44	0.07	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.10	0.16	0.16	0.22	0.21	0.18	0.14	0.35	0.35	0.05	0.26	0.26
s, saturation flow rate [veh/h]	999	1870	1813	1101	3560	1589	1781	3560	1821	1781	3560	1715
c, Capacity [veh/h]	329	440	426	387	860	384	284	1560	798	126	1245	600
d1, Uniform Delay [s]	21.84	31.31	31.32	22.93	32.71	31.81	36.94	21.83	21.89	41.01	25.68	25.68
k, delay calibration	0.11	0.11	0.11	0.20	0.11	0.12	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.49	1.77	1.84	2.96	2.62	3.68	7.55	4.25	8.19	7.32	3.91	7.87
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.29	0.67	0.67	0.62	0.86	0.77	0.86	0.79	0.80	0.71	0.74	0.74
d, Delay for Lane Group [s/veh]	22.33	33.08	33.16	25.89	35.33	35.50	44.49	26.08	30.08	48.33	29.60	33.56
Lane Group LOS	C	C	C	C	D	D	D	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.40	5.88	5.73	3.97	7.79	6.19	5.67	11.32	12.54	2.17	8.81	9.15
50th-Percentile Queue Length [ft/ln]	34.91	147.07	143.25	99.28	194.84	154.75	141.69	283.07	313.58	54.17	220.22	228.65
95th-Percentile Queue Length [veh/ln]	2.51	9.86	9.66	7.15	12.37	10.27	9.57	16.84	18.35	3.90	13.68	14.11
95th-Percentile Queue Length [ft/ln]	62.83	246.52	241.40	178.70	309.30	256.76	239.30	421.03	458.79	97.51	341.90	352.65

Movement, Approach, & Intersection Results

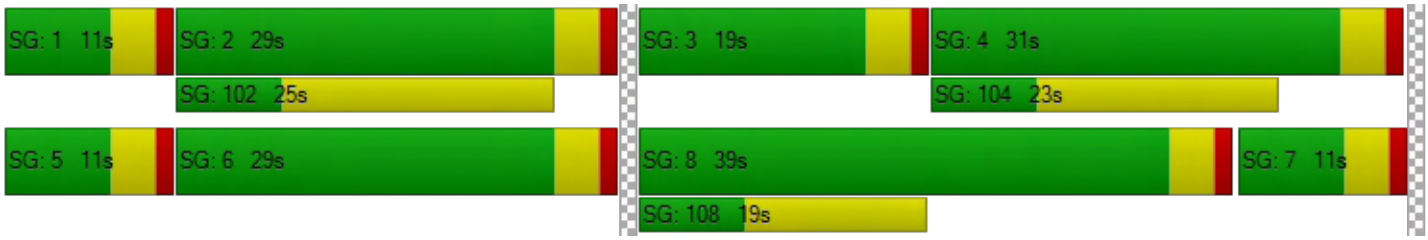
d_M, Delay for Movement [s/veh]	22.33	33.11	33.16	25.89	35.33	35.50	44.49	27.29	30.08	48.33	30.35	33.56
Movement LOS	C	C	C	C	D	D	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	31.57			33.58			29.40			31.97		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	31.31											
Intersection LOS	C											
Intersection V/C	0.800											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.612	2.821	0.000	3.253
Crosswalk LOS	B	C	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	556	556	778	600
d_b, Bicycle Delay [s]	23.47	23.47	16.81	22.05
l_b,int, Bicycle LOS Score for Intersection	2.118	2.609	2.726	2.357
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



General Plan Buildout With Project

Signal Hill Business Park

Vistro File: G:\...\AM Base.vistro
Report File: G:\...\GPP AM.pdf

Scenario 6 General Plan Buildout With Project
7/3/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Orange Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Thru	0.969	-	E
2	Orange Ave (NS) at Willow St (EW)	Signalized	ICU 1	NB Thru	0.898	-	D
3	Orange Ave (NS) at Burnett St (EW)	Signalized	ICU 1	NB Thru	0.780	-	C
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Right	0.889	-	D
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.752	29.1	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.138	15.7	C
7	Walnut Ave (NS) at Spring St (EW)	Signalized	ICU 1	WB Right	0.742	-	C
8	Walnut Ave (NS) at Willow St (EW)	Signalized	ICU 1	WB Thru	0.602	-	B
9	Walnut Ave (NS) at Burnett St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.984	33.7	D
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.822	23.9	C
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	NB Thru	0.666	-	B
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	1.351	17.9	B
13	Gaviota Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	SB Left	0.058	13.3	B
14	Cherry Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Right	0.899	-	D
15	Cherry Ave (NS) at Willow St (EW)	Signalized	ICU 1	WB Thru	0.860	-	D
16	Cherry Ave (NS) at Burnett St/Skyline Dr (EW)	Signalized	ICU 1	NB Thru	0.750	-	C
17	Cherry Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Thru	0.715	-	C
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	NB Thru	0.786	-	C

19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	NB Thru	0.627	-	B
20	Cherry Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	WB Right	0.951	41.5	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Orange Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.969

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	160.00	75.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	28	579	57	99	518	130	88	610	65	107	942	141
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	21	8	19	42	0	0	8	0	4	2	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	727	78	140	674	159	107	752	79	135	1151	177
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	182	20	35	169	40	27	188	20	34	288	44
Total Analysis Volume [veh/h]	34	727	78	140	674	159	107	752	79	135	1151	177
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.23	0.05	0.09	0.42	0.10	0.07	0.24	0.05	0.08	0.36	0.11
Intersection LOS	E											
Intersection V/C	0.969											

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.898

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	82	492	92	40	439	83	84	931	72	69	1128	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	12	0	8	36	2	4	30	21	0	16	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	105	612	112	57	572	103	106	1166	109	84	1392	89
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	153	28	14	143	26	27	292	27	21	348	22
Total Analysis Volume [veh/h]	105	612	112	57	572	103	106	1166	109	84	1392	89
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.38	0.00	0.04	0.36	0.06	0.07	0.27	0.27	0.05	0.31	0.31
Intersection LOS	D											
Intersection V/C	0.898											

Intersection Level Of Service Report
Intersection 3: Orange Ave (NS) at Burnett St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.780

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	110.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	21	616	30	32	536	11	24	96	28	57	64	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	17	16	1	56	0	0	3	0	26	4	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	769	53	40	710	13	29	120	34	96	82	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	192	13	10	178	3	7	30	9	24	21	7
Total Analysis Volume [veh/h]	26	769	53	40	710	13	29	120	34	96	82	27
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.48	0.03	0.03	0.44	0.01	0.02	0.11	0.11	0.06	0.13	0.13
Intersection LOS	C											
Intersection V/C	0.780											

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.889

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	40	667	22	28	526	25	78	90	38	47	124	57
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	3	54	19	9	6	9	0	4	2	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	829	30	88	661	40	101	119	46	61	153	83
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	207	8	22	165	10	25	30	12	15	38	21
Total Analysis Volume [veh/h]	49	829	30	88	661	40	101	119	46	61	153	83
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.54	0.54	0.06	0.44	0.44	0.06	0.14	0.03	0.04	0.13	0.05
Intersection LOS	D											
Intersection V/C	0.889											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	29.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.752

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	511	198	53	345	101	104	864	67	239	1360	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	5	8	0	7	16	13	56	0	1	13	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	120	628	250	65	428	139	140	1110	82	293	1672	123
Peak Hour Factor	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	175	70	18	120	39	39	310	23	82	467	34
Total Analysis Volume [veh/h]	134	702	279	73	478	155	156	1240	92	327	1868	137
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	16	41	0	28	53	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	27	52	27	27	27	11	40	40	21	50	50
g / C, Green / Cycle	0.27	0.27	0.52	0.27	0.27	0.27	0.11	0.40	0.40	0.21	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.15	0.20	0.18	0.10	0.13	0.10	0.09	0.25	0.25	0.18	0.37	0.38
s, saturation flow rate [veh/h]	916	3560	1589	745	3560	1589	1781	3560	1805	1781	3560	1806
c, Capacity [veh/h]	198	962	821	125	962	429	189	1437	728	367	1794	910
d1, Uniform Delay [s]	43.52	33.18	14.19	47.39	30.77	29.51	43.82	23.66	23.66	38.60	19.60	19.74
k, delay calibration	0.11	0.11	0.15	0.11	0.11	0.11	0.11	0.50	0.50	0.17	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.99	1.08	0.33	4.23	0.40	0.51	8.87	1.98	3.86	10.84	2.77	5.58
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.68	0.73	0.34	0.58	0.50	0.36	0.83	0.62	0.62	0.89	0.74	0.75
d, Delay for Lane Group [s/veh]	47.51	34.26	14.52	51.62	31.16	30.02	52.69	25.64	27.52	49.44	22.36	25.32
Lane Group LOS	D	C	B	D	C	C	D	C	C	D	C	C
Critical Lane Group	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	3.49	7.65	3.57	1.96	4.85	3.05	4.18	8.30	8.80	8.69	11.93	13.04
50th-Percentile Queue Length [ft/ln]	87.29	191.24	89.26	49.12	121.37	76.20	104.55	207.60	219.97	217.34	298.18	325.94
95th-Percentile Queue Length [veh/ln]	6.28	12.19	6.43	3.54	8.47	5.49	7.53	13.03	13.66	13.53	17.59	18.96
95th-Percentile Queue Length [ft/ln]	157.12	304.64	160.67	88.41	211.70	137.16	188.19	325.75	341.59	338.22	439.78	473.98

Movement, Approach, & Intersection Results

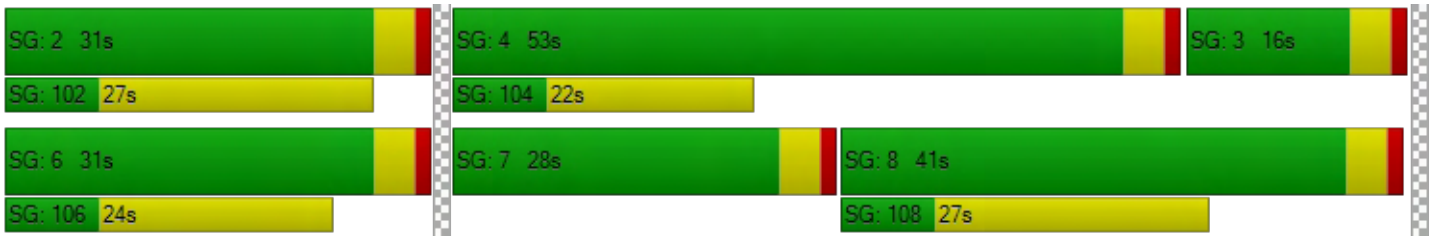
d_M, Delay for Movement [s/veh]	47.51	34.26	14.52	51.62	31.16	30.02	52.69	26.18	27.52	49.44	23.22	25.32
Movement LOS	D	C	B	D	C	C	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	30.91			33.03			29.04			27.02		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	29.08											
Intersection LOS	C											
Intersection V/C	0.752											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.839	2.734	3.382	3.340
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	540	540	740	980
d_b, Bicycle Delay [s]	26.65	26.65	19.85	13.01
l_b,int, Bicycle LOS Score for Intersection	2.479	2.142	2.378	2.842
Bicycle LOS	B	B	B	C

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	15.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.138

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	16	6	120	5	5	228
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	0	18	49	0	4
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	36	7	164	55	6	282
Peak Hour Factor	0.6710	0.6710	0.6710	0.6710	0.6710	0.6710
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	3	61	20	2	105
Total Analysis Volume [veh/h]	54	10	244	82	9	420
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.01	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	15.68	11.25	0.00	0.00	7.91	0.00
Movement LOS	C	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.53	0.53	0.00	0.00	0.01	0.01
95th-Percentile Queue Length [ft/ln]	13.17	13.17	0.00	0.00	0.36	0.36
d_A, Approach Delay [s/veh]	14.98		0.00		0.17	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	1.26					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 7: Walnut Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.742

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	102.00	100.00	100.00	98.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	90	102	62	29	119	46	31	635	55	102	1052	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	0	0	9	0	0	9	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	127	76	35	154	56	38	784	67	124	1286	52
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	32	19	9	39	14	10	196	17	31	322	13
Total Analysis Volume [veh/h]	110	127	76	35	154	56	38	784	67	124	1286	52
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.08	0.05	0.02	0.13	0.13	0.02	0.27	0.27	0.08	0.42	0.42
Intersection LOS	C											
Intersection V/C	0.742											

Intersection Level Of Service Report
Intersection 8: Walnut Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.602

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	106.00	100.00	100.00	100.00	100.00	100.00	204.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	158	160	39	106	32	32	982	41	50	1199	69
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	22	3	5	0	9	0	0	24	14	3	7	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	84	196	200	48	138	39	39	1222	64	64	1470	84
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	49	50	12	35	10	10	306	16	16	368	21
Total Analysis Volume [veh/h]	84	196	200	48	138	39	39	1222	64	64	1470	84
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.12	0.12	0.03	0.04	0.02	0.02	0.27	0.27	0.04	0.32	0.32
Intersection LOS	B											
Intersection V/C	0.602											

Intersection Level Of Service Report
Intersection 9: Walnut Ave (NS) at Burnett St (EW)

Control Type:	All-way stop	Delay (sec / veh):	33.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.984

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	44	281	25	10	140	40	37	43	60	41	84	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	3	1	10	4	1	18	1	4	26	1
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	54	346	34	13	181	53	46	70	74	54	128	21
Peak Hour Factor	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050	0.8050
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	107	11	4	56	16	14	22	23	17	40	7
Total Analysis Volume [veh/h]	67	430	42	16	225	66	57	87	92	67	159	26
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	505	569	471	523	492	486
Degree of Utilization, x	0.98	0.07	0.51	0.13	0.48	0.52

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	13.14	0.24	2.86	0.43	2.56	2.94
95th-Percentile Queue Length [ft]	328.55	5.96	71.47	10.75	63.93	73.47
Approach Delay [s/veh]	58.28		16.46		16.86	18.13
Approach LOS	F		C		C	C
Intersection Delay [s/veh]	33.74					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	23.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.822

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	22	207	8	48	131	137	21	77	26	23	70	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	4	6	17	0	13	0	0	0	18	56	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	259	27	59	173	167	26	94	50	84	85	43
Peak Hour Factor	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	85	9	19	57	55	9	31	16	28	28	14
Total Analysis Volume [veh/h]	41	341	36	78	228	220	34	124	66	111	112	57
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	509	473	532	470	477
Degree of Utilization, x	0.82	0.65	0.41	0.48	0.59

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	8.07	4.53	2.01	2.53	3.69
95th-Percentile Queue Length [ft]	201.83	113.33	50.34	63.17	92.34
Approach Delay [s/veh]	34.96	19.48		17.45	20.64
Approach LOS	D	C		C	C
Intersection Delay [s/veh]	23.86				
Intersection LOS	C				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.666

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	167	44	34	125	44	64	107	82	47	105	25
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	81	0	0	22	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	285	54	41	175	54	78	131	100	57	128	31
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	71	14	10	44	14	20	33	25	14	32	8
Total Analysis Volume [veh/h]	60	285	54	41	175	54	78	131	100	57	128	31
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.21	0.21	0.03	0.14	0.14	0.05	0.19	0.19	0.04	0.14	0.14
Intersection LOS	B											
Intersection V/C	0.666											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	17.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.351

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	101	43	38	45	106	89	1032	83	34	1618	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	4	0	8	6	8	47	17	0	0	6	30
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	62	127	52	54	61	137	156	1276	101	41	1980	140
Peak Hour Factor	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	34	14	15	16	37	42	345	27	11	535	38
Total Analysis Volume [veh/h]	67	137	56	58	66	148	169	1379	109	44	2141	151
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	57.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	29	0	0	29	0	0	71	0	0	71	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	71	71	71	71	71	71
g / C, Green / Cycle	0.21	0.21	0.71	0.71	0.71	0.71	0.71	0.71
(v / s)_i Volume / Saturation Flow Rate	0.20	0.19	1.05	0.28	0.28	0.12	0.43	0.43
s, saturation flow rate [veh/h]	1326	1416	161	3560	1801	354	3560	1808
c, Capacity [veh/h]	328	345	148	2517	1273	276	2517	1278
d1, Uniform Delay [s]	37.80	37.80	37.90	5.94	5.94	10.20	7.46	7.53
k, delay calibration	0.20	0.19	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.63	6.75	117.15	0.46	0.91	1.23	1.07	2.16
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.79	0.79	1.14	0.39	0.39	0.16	0.60	0.61
d, Delay for Lane Group [s/veh]	45.43	44.55	155.04	6.40	6.85	11.43	8.53	9.69
Lane Group LOS	D	D	F	A	A	B	A	A
Critical Lane Group	Yes	No	Yes	No	No	No	No	No
50th-Percentile Queue Length [veh/ln]	6.80	7.00	8.50	3.76	3.96	0.54	7.30	7.95
50th-Percentile Queue Length [ft/ln]	170.03	175.09	212.49	93.96	99.11	13.49	182.59	198.87
95th-Percentile Queue Length [veh/ln]	11.08	11.34	14.55	6.77	7.14	0.97	11.74	12.58
95th-Percentile Queue Length [ft/ln]	276.96	283.59	363.64	169.13	178.40	24.29	293.39	314.50

Movement, Approach, & Intersection Results

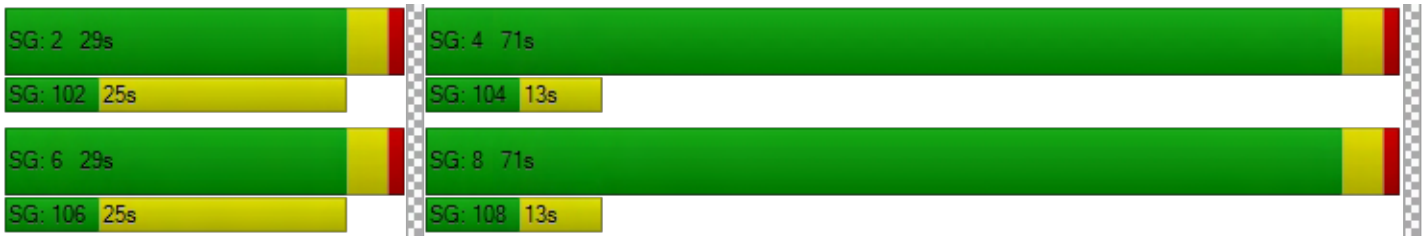
d_M, Delay for Movement [s/veh]	45.43	45.43	45.43	44.55	44.55	44.55	155.04	6.53	6.85	11.43	8.87	9.69
Movement LOS	D	D	D	D	D	D	F	A	A	B	A	A
d_A, Approach Delay [s/veh]	45.43			44.55			21.69			8.98		
Approach LOS	D			D			C			A		
d_I, Intersection Delay [s/veh]	17.87											
Intersection LOS	B											
Intersection V/C	1.351											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.016	2.422	3.253	3.215
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	500	500	1340	1340
d_b, Bicycle Delay [s]	28.13	28.13	5.45	5.45
l_b,int, Bicycle LOS Score for Intersection	1.989	2.008	2.471	2.844
Bicycle LOS	A	B	B	C

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 13: Gaviota Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	13.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.058

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	16	4	16	18	1	12	3	115	12	15	97	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	17	0	0	56	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	5	20	22	1	15	4	157	15	18	174	6
Peak Hour Factor	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090	0.8090
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	2	6	7	0	5	1	49	5	6	54	2
Total Analysis Volume [veh/h]	25	6	25	27	1	19	5	194	19	22	215	7
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.01	0.03	0.06	0.00	0.02	0.00	0.00	0.00	0.02	0.00	0.00
d_M, Delay for Movement [s/veh]	13.23	13.18	9.91	13.35	13.18	9.94	7.66	0.00	0.00	7.67	0.00	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.31	0.31	0.31	0.27	0.27	0.27	0.01	0.01	0.01	0.04	0.04	0.04
95th-Percentile Queue Length [ft/ln]	7.83	7.83	7.83	6.79	6.79	6.79	0.22	0.22	0.22	1.00	1.00	1.00
d_A, Approach Delay [s/veh]	11.74			11.96			0.18			0.69		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	2.53											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.899

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	86	1069	170	281	1098	137	120	544	75	105	1052	358
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	21	1	0	46	0	0	1	8	5	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	107	1325	208	343	1386	167	146	665	100	133	1284	437
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	331	52	86	347	42	37	166	25	33	321	109
Total Analysis Volume [veh/h]	107	1325	208	343	1386	167	146	665	100	133	1284	437
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

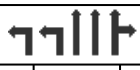
Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.32	0.32	0.11	0.32	0.32	0.09	0.16	0.16	0.08	0.27	0.27
Intersection LOS	D											
Intersection V/C	0.899											

Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.860

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	167	1031	161	149	765	147	177	836	85	231	1124	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	24	28	31	0	1	28	0	51	10	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	204	1273	220	210	964	179	217	1048	104	333	1381	150
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	318	55	53	241	45	54	262	26	83	345	38
Total Analysis Volume [veh/h]	204	1273	220	210	964	179	217	1048	104	333	1381	150
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.27	0.03	0.07	0.24	0.24	0.07	0.24	0.24	0.10	0.32	0.32
Intersection LOS	D											
Intersection V/C	0.860											

Intersection Level Of Service Report
Intersection 16: Cherry Ave (NS) at Burnett St/Skyline Dr (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.750

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	0	0	0	1
Pocket Length [ft]	193.00	100.00	96.00	200.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	94.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	34	1301	17	52	919	65	21	26	11	12	36	115
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	36	0	0	91	0	0	0	1	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	42	1623	21	63	1212	79	26	32	14	15	44	140
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	406	5	16	303	20	7	8	4	4	11	35
Total Analysis Volume [veh/h]	42	1623	21	63	1212	79	26	32	14	15	44	140
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.51	0.01	0.04	0.38	0.05	0.02	0.05	0.05	0.01	0.04	0.09
Intersection LOS	C											
Intersection V/C	0.750											

Intersection Level Of Service Report
Intersection 17: Cherry Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.715

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	0	0	0
Pocket Length [ft]	200.00	100.00	100.00	186.00	100.00	89.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	41	1200	4	11	844	88	112	1	55	6	3	23
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	20	0	0	36	56	17	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	1484	5	13	1066	163	154	1	67	7	4	28
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	371	1	3	267	41	39	0	17	2	1	7
Total Analysis Volume [veh/h]	50	1484	5	13	1066	163	154	1	67	7	4	28
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.46	0.00	0.01	0.33	0.10	0.10	0.14	0.14	0.00	0.02	0.02
Intersection LOS	C											
Intersection V/C	0.715											

Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.786

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	1035	10	62	763	88	79	47	62	11	77	150
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	0	4	19	13	2	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	1278	12	80	950	120	98	57	76	13	94	186
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	320	3	20	238	30	25	14	19	3	24	47
Total Analysis Volume [veh/h]	60	1278	12	80	950	120	98	57	76	13	94	186
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.40	0.01	0.05	0.30	0.08	0.06	0.10	0.05	0.01	0.18	0.18
Intersection LOS	C											
Intersection V/C	0.786											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.627

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	18	890	14	7	844	34	75	9	109	26	15	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	12	0	4	15	0	0	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	1098	17	13	1045	41	92	11	133	32	18	79
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	275	4	3	261	10	23	3	33	8	5	20
Total Analysis Volume [veh/h]	22	1098	17	13	1045	41	92	11	133	32	18	79
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.35	0.35	0.01	0.34	0.34	0.06	0.09	0.09	0.02	0.08	0.08
Intersection LOS	B											
Intersection V/C	0.627											

Intersection Level Of Service Report
Intersection 20: Cherry Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	41.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.951

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	118.00	135.00	100.00	100.00	180.00	100.00	100.00	186.00	100.00	100.00
Speed [mph]	30.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	78	565	22	129	432	256	190	919	65	34	1309	204
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	3	0	11	4	0	0	24	1	0	28	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	103	692	27	168	531	312	232	1145	80	41	1625	258
Peak Hour Factor	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	184	7	45	141	83	62	304	21	11	431	68
Total Analysis Volume [veh/h]	109	735	29	178	564	331	246	1215	85	44	1725	274
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	6.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	29	0	11	29	0	18	49	0	11	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	0	0	0	12	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	34	23	23	34	23	23	16	49	49	5	39	39
g / C, Green / Cycle	0.34	0.23	0.23	0.34	0.23	0.23	0.16	0.49	0.49	0.05	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.10	0.21	0.21	0.18	0.16	0.21	0.14	0.24	0.24	0.02	0.38	0.38
s, saturation flow rate [veh/h]	1087	1870	1845	991	3560	1589	1781	3560	1808	1781	3560	1743
c, Capacity [veh/h]	346	426	421	299	824	368	278	1751	889	89	1373	672
d1, Uniform Delay [s]	24.67	37.54	37.54	27.04	35.13	37.34	41.34	17.05	17.05	46.30	30.25	30.45
k, delay calibration	0.11	0.22	0.22	0.16	0.11	0.23	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.52	13.18	13.34	2.73	1.02	15.02	9.13	0.99	1.95	4.20	18.83	31.19
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.32	0.90	0.90	0.60	0.68	0.90	0.88	0.49	0.49	0.49	0.97	0.98
d, Delay for Lane Group [s/veh]	25.19	50.72	50.88	29.78	36.15	52.36	50.47	18.05	19.00	50.50	49.08	61.64
Lane Group LOS	C	D	D	C	D	D	D	B	B	D	D	E
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.85	10.54	10.42	3.29	6.30	9.25	6.51	6.51	6.85	1.15	18.56	20.73
50th-Percentile Queue Length [ft/ln]	46.18	263.42	260.42	82.22	157.47	231.17	162.81	162.81	171.28	28.87	463.88	518.28
95th-Percentile Queue Length [veh/ln]	3.32	15.86	15.71	5.92	10.41	14.23	10.70	10.70	11.14	2.08	25.62	28.20
95th-Percentile Queue Length [ft/ln]	83.12	396.51	392.75	147.99	260.37	355.85	267.44	267.44	278.59	51.96	640.50	704.95

Movement, Approach, & Intersection Results

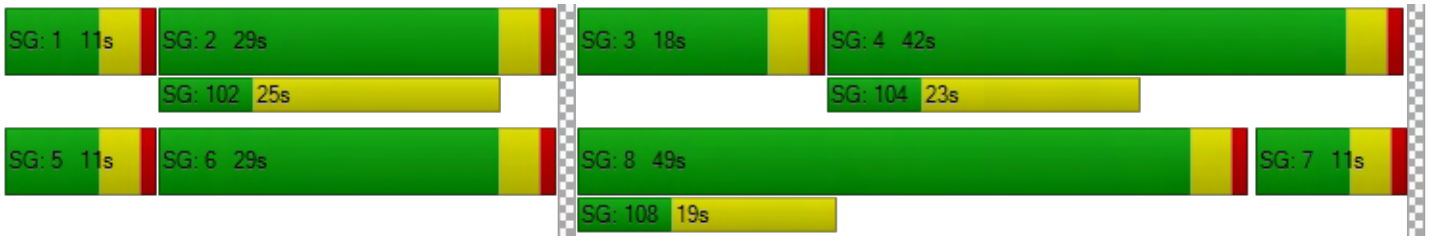
d_M, Delay for Movement [s/veh]	25.19	50.80	50.88	29.78	36.15	52.36	50.47	18.32	19.00	50.50	51.90	61.64
Movement LOS	C	D	D	C	D	D	D	B	B	D	D	E
d_A, Approach Delay [s/veh]	47.60			40.09			23.48			53.18		
Approach LOS	D			D			C			D		
d_I, Intersection Delay [s/veh]	41.47											
Intersection LOS	D											
Intersection V/C	0.951											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	0.00	39.61
I_p,int, Pedestrian LOS Score for Intersection	2.610	2.836	0.000	3.225
Crosswalk LOS	B	C	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	500	500	900	760
d_b, Bicycle Delay [s]	28.13	28.13	15.13	19.22
I_b,int, Bicycle LOS Score for Intersection	2.280	2.445	2.410	2.683
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Signal Hill Business Park

Vistro File: G:\...\PM Base.vistro
Report File: G:\...\GPP PM.pdf

Scenario 6 General Plan Buildout With Project
7/3/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Orange Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Thru	0.994	-	E
2	Orange Ave (NS) at Willow St (EW)	Signalized	ICU 1	EB Thru	1.039	-	F
3	Orange Ave (NS) at Burnett St (EW)	Signalized	ICU 1	SB Thru	0.748	-	C
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	SB Thru	0.773	-	C
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.767	27.6	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.112	12.9	B
7	Walnut Ave (NS) at Spring St (EW)	Signalized	ICU 1	EB Thru	0.785	-	C
8	Walnut Ave (NS) at Willow St (EW)	Signalized	ICU 1	EB Thru	0.787	-	C
9	Walnut Ave (NS) at Burnett St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.802	23.0	C
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.729	19.7	C
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	SB Thru	0.586	-	A
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	WB Left	0.767	15.8	B
13	Gaviota Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	SB Left	0.045	14.5	B
14	Cherry Ave (NS) at Spring St (EW)	Signalized	ICU 1	SB Thru	0.870	-	D
15	Cherry Ave (NS) at Willow St (EW)	Signalized	ICU 1	EB Thru	1.036	-	F
16	Cherry Ave (NS) at Burnett St/Skyline Dr (EW)	Signalized	ICU 1	SB Thru	0.744	-	C
17	Cherry Ave (NS) at Hill St (EW)	Signalized	ICU 1	SB Thru	0.778	-	C
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	SB Thru	0.722	-	C

19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	SB Right	0.583	-	A
20	Cherry Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	WB Left	0.807	31.5	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Orange Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.994

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	160.00	75.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	58	586	58	102	564	190	129	935	54	50	662	160
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	39	6	13	28	0	0	4	0	10	8	20
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	71	754	77	137	716	232	157	1145	66	71	816	215
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	189	19	34	179	58	39	286	17	18	204	54
Total Analysis Volume [veh/h]	71	754	77	137	716	232	157	1145	66	71	816	215
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.24	0.05	0.09	0.45	0.15	0.10	0.36	0.04	0.04	0.26	0.13
Intersection LOS	E											
Intersection V/C	0.994											

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.039

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	460	101	73	500	67	89	1451	74	135	1077	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	19	34	0	16	17	5	3	22	8	0	29	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	81	595	123	105	627	87	112	1792	98	165	1343	107
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	149	31	26	157	22	28	448	25	41	336	27
Total Analysis Volume [veh/h]	81	595	123	105	627	87	112	1792	98	165	1343	107
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.37	0.00	0.07	0.39	0.05	0.07	0.39	0.39	0.10	0.30	0.30
Intersection LOS	F											
Intersection V/C	1.039											

Intersection Level Of Service Report
Intersection 3: Orange Ave (NS) at Burnett St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.748

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	110.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	10	552	35	26	649	29	17	47	20	40	66	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	51	31	0	25	0	0	5	0	15	3	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	724	74	32	817	35	21	62	24	64	84	39
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	181	19	8	204	9	5	16	6	16	21	10
Total Analysis Volume [veh/h]	12	724	74	32	817	35	21	62	24	64	84	39
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.45	0.05	0.02	0.51	0.02	0.01	0.07	0.07	0.04	0.12	0.12
Intersection LOS	C											
Intersection V/C	0.748											

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.773

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	31	563	33	27	592	43	36	107	30	42	103	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	20	16	5	11	3	0	3	8	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	710	43	53	738	57	55	134	37	54	134	89
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	178	11	13	185	14	14	34	9	14	34	22
Total Analysis Volume [veh/h]	38	710	43	53	738	57	55	134	37	54	134	89
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.47	0.47	0.03	0.50	0.50	0.03	0.12	0.02	0.03	0.12	0.06
Intersection LOS	C											
Intersection V/C	0.773											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	27.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.767

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	73	495	277	80	499	97	84	1383	105	183	879	79
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	2	0	6	13	18	22	0	7	50	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	612	340	98	615	131	120	1709	128	230	1122	96
Peak Hour Factor	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	157	87	25	158	34	31	438	33	59	287	25
Total Analysis Volume [veh/h]	91	627	348	100	630	134	123	1751	131	236	1150	98
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	13	41	0	18	46	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	27	45	27	27	27	8	37	37	14	43	43
g / C, Green / Cycle	0.30	0.30	0.50	0.30	0.30	0.30	0.09	0.41	0.41	0.16	0.48	0.48
(v / s)_i Volume / Saturation Flow Rate	0.11	0.18	0.22	0.13	0.18	0.08	0.07	0.35	0.35	0.13	0.23	0.23
s, saturation flow rate [veh/h]	796	3560	1589	798	3560	1589	1781	3560	1804	1781	3560	1796
c, Capacity [veh/h]	181	1068	794	182	1068	477	156	1467	743	276	1706	861
d1, Uniform Delay [s]	38.75	26.79	14.46	39.16	26.82	24.11	40.28	23.98	24.04	37.08	15.93	15.93
k, delay calibration	0.11	0.11	0.20	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.15	0.52	0.70	2.57	0.52	0.32	8.49	6.37	12.02	7.46	0.99	1.96
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.50	0.59	0.44	0.55	0.59	0.28	0.79	0.85	0.85	0.86	0.49	0.49
d, Delay for Lane Group [s/veh]	40.90	27.31	15.16	41.73	27.34	24.43	48.77	30.35	36.06	44.55	16.92	17.89
Lane Group LOS	D	C	B	D	C	C	D	C	D	D	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.03	5.56	4.35	2.29	5.67	2.18	2.98	12.43	13.85	5.48	5.59	5.87
50th-Percentile Queue Length [ft/ln]	50.80	138.89	108.67	57.35	141.87	54.56	74.38	310.84	346.34	136.88	139.71	146.73
95th-Percentile Queue Length [veh/ln]	3.66	9.42	7.77	4.13	9.58	3.93	5.36	18.22	19.96	9.31	9.47	9.84
95th-Percentile Queue Length [ft/ln]	91.44	235.53	194.15	103.23	239.55	98.21	133.88	455.41	498.95	232.82	236.64	246.05

Movement, Approach, & Intersection Results

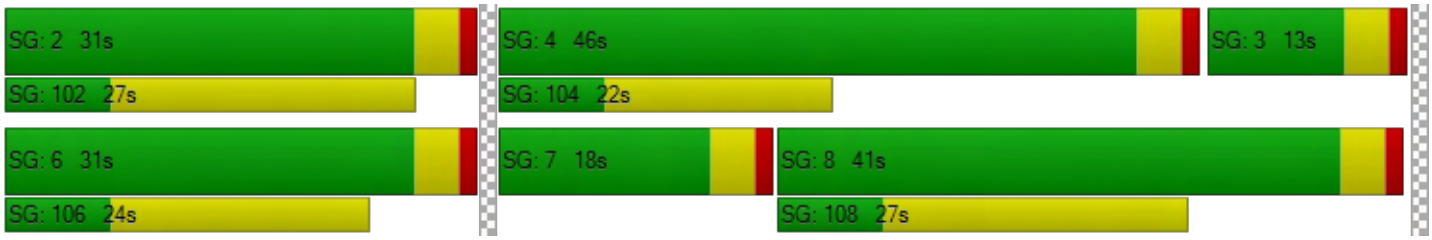
d_M, Delay for Movement [s/veh]	40.90	27.31	15.16	41.73	27.34	24.43	48.77	31.99	36.06	44.55	17.19	17.89
Movement LOS	D	C	B	D	C	C	D	C	D	D	B	B
d_A, Approach Delay [s/veh]	24.51			28.56			33.29			21.59		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	27.60											
Intersection LOS	C											
Intersection V/C	0.767											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.843	2.731	3.272	3.334
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	600	600	822	933
d_b, Bicycle Delay [s]	22.05	22.05	15.61	12.80
l_b,int, Bicycle LOS Score for Intersection	2.439	2.272	2.662	2.376
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	12.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.112

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	4	6	146	4	4	179
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	44	0	6	20	0	16
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	7	184	25	5	234
Peak Hour Factor	0.8490	0.8490	0.8490	0.8490	0.8490	0.8490
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	2	54	7	1	69
Total Analysis Volume [veh/h]	58	8	217	29	6	276
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	12.88	10.35	0.00	0.00	7.72	0.00
Movement LOS	B	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.41	0.41	0.00	0.00	0.01	0.01
95th-Percentile Queue Length [ft/ln]	10.34	10.34	0.00	0.00	0.28	0.28
d_A, Approach Delay [s/veh]	12.57		0.00		0.16	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	1.47					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 7: Walnut Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.785

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	102.00	100.00	100.00	98.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	106	214	137	42	109	29	73	1046	91	65	738	66
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	0	0	3	0	0	6	0	0	9	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	129	269	167	51	136	35	89	1282	111	79	909	81
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	67	42	13	34	9	22	321	28	20	227	20
Total Analysis Volume [veh/h]	129	269	167	51	136	35	89	1282	111	79	909	81
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.17	0.10	0.03	0.11	0.11	0.06	0.44	0.44	0.05	0.31	0.31
Intersection LOS	C											
Intersection V/C	0.785											

Intersection Level Of Service Report
Intersection 8: Walnut Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.787

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	106.00	100.00	100.00	100.00	100.00	100.00	204.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	61	179	183	80	152	51	49	1520	56	94	1168	60
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	13	8	4	0	3	0	0	11	27	6	24	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	87	226	227	98	188	62	60	1865	95	121	1449	73
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	57	57	25	47	16	15	466	24	30	362	18
Total Analysis Volume [veh/h]	87	226	227	98	188	62	60	1865	95	121	1449	73
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.14	0.14	0.06	0.06	0.04	0.04	0.41	0.41	0.08	0.32	0.32
Intersection LOS	C											
Intersection V/C	0.787											

Intersection Level Of Service Report
Intersection 9: Walnut Ave (NS) at Burnett St (EW)

Control Type:	All-way stop	Delay (sec / veh):	23.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.802

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	15	298	21	22	253	22	53	76	15	21	64	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	9	5	1	3	2	4	32	0	3	16	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	373	31	28	312	29	69	125	18	29	94	18
Peak Hour Factor	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170	0.9170
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	102	8	8	85	8	19	34	5	8	26	5
Total Analysis Volume [veh/h]	22	407	34	31	340	32	75	136	20	32	103	20
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	535	601	525	590	513	496
Degree of Utilization, x	0.80	0.06	0.71	0.05	0.45	0.31

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	7.70	0.18	5.60	0.17	2.31	1.32
95th-Percentile Queue Length [ft]	192.47	4.49	139.88	4.29	57.73	33.07
Approach Delay [s/veh]	29.74		23.18		15.65	13.52
Approach LOS	D		C		C	B
Intersection Delay [s/veh]	23.02					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	19.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.729

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	23	201	22	34	217	57	34	100	21	21	96	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	13	48	0	6	0	0	0	6	19	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	44	258	75	41	271	70	41	122	32	45	117	40
Peak Hour Factor	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	71	21	11	74	19	11	33	9	12	32	11
Total Analysis Volume [veh/h]	48	282	82	45	296	77	45	133	35	49	128	44
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	565	519	585	511	514
Degree of Utilization, x	0.73	0.66	0.13	0.42	0.43

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	6.12	4.75	0.45	2.04	2.14
95th-Percentile Queue Length [ft]	152.88	118.67	11.30	50.89	53.47
Approach Delay [s/veh]	24.60	19.74		15.00	15.19
Approach LOS	C	C		C	C
Intersection Delay [s/veh]	19.73				
Intersection LOS	C				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.586

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	26	199	44	28	193	31	47	83	29	39	37	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	31	0	0	71	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	274	54	34	306	38	57	101	35	48	45	26
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	69	14	9	77	10	14	25	9	12	11	7
Total Analysis Volume [veh/h]	32	274	54	34	306	38	57	101	35	48	45	26
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.21	0.21	0.02	0.22	0.22	0.04	0.12	0.12	0.03	0.07	0.07
Intersection LOS	A											
Intersection V/C	0.586											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	15.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.767

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	25	106	29	51	134	84	107	1682	54	58	1030	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	27	4	40	14	10	0	0	17	11
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	135	35	89	167	142	145	2062	66	71	1274	85
Peak Hour Factor	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	35	9	23	44	37	38	541	17	19	335	22
Total Analysis Volume [veh/h]	33	142	37	93	175	149	152	2166	69	75	1338	89
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	44.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	34	0	0	34	0	0	56	0	0	56	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	25	25	57	57	57	57	57	57
g / C, Green / Cycle	0.28	0.28	0.63	0.63	0.63	0.63	0.63	0.63
(v / s)_i Volume / Saturation Flow Rate	0.13	0.26	0.41	0.41	0.42	0.44	0.27	0.27
s, saturation flow rate [veh/h]	1585	1609	375	3560	1841	171	3560	1811
c, Capacity [veh/h]	488	498	259	2250	1163	140	2250	1144
d1, Uniform Delay [s]	26.46	31.33	20.67	10.37	10.42	32.43	8.29	8.29
k, delay calibration	0.11	0.29	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.61	9.47	9.39	1.49	2.92	13.96	0.58	1.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.43	0.84	0.59	0.65	0.66	0.54	0.42	0.42
d, Delay for Lane Group [s/veh]	27.07	40.80	30.06	11.87	13.33	46.40	8.87	9.43
Lane Group LOS	C	D	C	B	B	D	A	A
Critical Lane Group	No	Yes	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.71	9.80	3.28	8.38	9.21	2.20	4.25	4.50
50th-Percentile Queue Length [ft/ln]	92.83	245.08	81.98	209.43	230.26	55.00	106.25	112.51
95th-Percentile Queue Length [veh/ln]	6.68	14.94	5.90	13.12	14.19	3.96	7.63	7.98
95th-Percentile Queue Length [ft/ln]	167.09	373.45	147.56	328.10	354.69	99.01	190.78	199.49

Movement, Approach, & Intersection Results

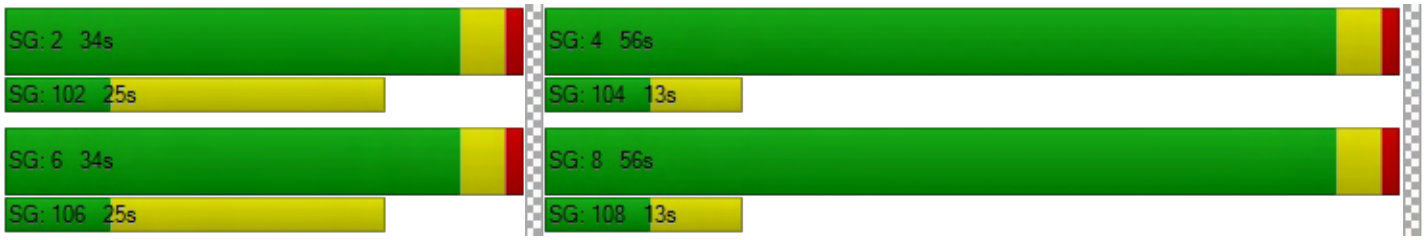
d_M, Delay for Movement [s/veh]	27.07	27.07	27.07	40.80	40.80	40.80	30.06	12.34	13.33	46.40	9.03	9.43
Movement LOS	C	C	C	D	D	D	C	B	B	D	A	A
d_A, Approach Delay [s/veh]	27.07			40.80			13.50			10.92		
Approach LOS	C			D			B			B		
d_I, Intersection Delay [s/veh]	15.80											
Intersection LOS	B											
Intersection V/C	0.767											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.080	2.416	3.185	3.255
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	667	667	1156	1156
d_b, Bicycle Delay [s]	20.00	20.00	8.02	8.02
l_b,int, Bicycle LOS Score for Intersection	1.909	2.248	2.872	2.386
Bicycle LOS	A	B	C	B

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 13: Gaviota Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	14.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.045

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	7	1	17	12	1	14	16	136	5	12	125	18
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	48	0	0	19	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	1	21	15	1	17	20	214	6	15	172	22
Peak Hour Factor	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200	0.8200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	0	6	5	0	5	6	65	2	5	52	7
Total Analysis Volume [veh/h]	11	1	26	18	1	21	24	261	7	18	210	27
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.03	0.05	0.00	0.03	0.02	0.00	0.00	0.01	0.00	0.00
d_M, Delay for Movement [s/veh]	14.32	14.19	10.02	14.55	14.19	9.90	7.73	0.00	0.00	7.79	0.00	0.00
Movement LOS	B	B	B	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.20	0.20	0.20	0.24	0.24	0.24	0.05	0.05	0.05	0.03	0.03	0.03
95th-Percentile Queue Length [ft/ln]	5.04	5.04	5.04	5.90	5.90	5.90	1.13	1.13	1.13	0.87	0.87	0.87
d_A, Approach Delay [s/veh]	11.38			12.10			0.64			0.55		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.99											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.870

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	1170	144	228	1250	109	155	916	128	93	656	368
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	43	5	0	28	0	0	2	4	2	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	128	1470	181	278	1553	133	189	1120	160	115	801	449
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	368	45	70	388	33	47	280	40	29	200	112
Total Analysis Volume [veh/h]	128	1470	181	278	1553	133	189	1120	160	115	801	449
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

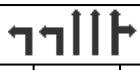
Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.34	0.34	0.09	0.35	0.35	0.12	0.27	0.27	0.07	0.20	0.20
Intersection LOS	D											
Intersection V/C	0.870											

Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.036

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	166	835	219	303	980	183	211	1292	132	318	990	175
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	28	43	13	20	1	0	15	0	27	29	28
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	203	1047	310	383	1216	224	257	1591	161	415	1237	242
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	262	78	96	304	56	64	398	40	104	309	61
Total Analysis Volume [veh/h]	203	1047	310	383	1216	224	257	1591	161	415	1237	242
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.22	0.06	0.12	0.30	0.30	0.08	0.37	0.37	0.13	0.31	0.31
Intersection LOS	F											
Intersection V/C	1.036											

Intersection Level Of Service Report
Intersection 16: Cherry Ave (NS) at Burnett St/Skyline Dr (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.744

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	0	0	0	1
Pocket Length [ft]	193.00	100.00	96.00	200.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	94.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	7	1064	31	132	1321	57	38	26	25	26	18	107
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	87	0	0	39	0	0	0	1	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	1385	38	161	1651	70	46	32	32	32	22	131
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	346	10	40	413	18	12	8	8	8	6	33
Total Analysis Volume [veh/h]	11	1385	38	161	1651	70	46	32	32	32	22	131
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.43	0.02	0.10	0.52	0.04	0.03	0.07	0.07	0.02	0.04	0.08
Intersection LOS	C											
Intersection V/C	0.744											

Intersection Level Of Service Report
Intersection 17: Cherry Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.778

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	0	0	0
Pocket Length [ft]	200.00	100.00	100.00	186.00	100.00	89.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	975	9	21	1214	135	112	2	66	5	2	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	41	0	0	21	19	48	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	1231	11	26	1502	184	185	2	81	6	2	12
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	308	3	7	376	46	46	1	20	2	1	3
Total Analysis Volume [veh/h]	60	1231	11	26	1502	184	185	2	81	6	2	12
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.38	0.01	0.02	0.47	0.12	0.12	0.17	0.17	0.00	0.01	0.01
Intersection LOS	C											
Intersection V/C	0.778											

Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.722

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	13	862	11	167	1071	44	55	35	13	7	16	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	24	0	3	14	4	12	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	1076	13	207	1321	58	79	43	16	9	20	151
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	269	3	52	330	15	20	11	4	2	5	38
Total Analysis Volume [veh/h]	16	1076	13	207	1321	58	79	43	16	9	20	151
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.34	0.01	0.13	0.41	0.04	0.05	0.08	0.01	0.01	0.11	0.11
Intersection LOS	C											
Intersection V/C	0.722											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.583

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	2	822	11	16	1054	16	21	6	24	15	6	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	19	0	3	11	0	0	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	1022	13	23	1297	20	26	7	29	18	7	51
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	256	3	6	324	5	7	2	7	5	2	13
Total Analysis Volume [veh/h]	2	1022	13	23	1297	20	26	7	29	18	7	51
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.32	0.32	0.01	0.41	0.41	0.02	0.02	0.02	0.01	0.05	0.05
Intersection LOS	A											
Intersection V/C	0.583											

Intersection Level Of Service Report
Intersection 20: Cherry Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	31.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.807

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	118.00	135.00	100.00	100.00	180.00	100.00	100.00	186.00	100.00	100.00
Speed [mph]	30.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	78	419	41	185	588	235	195	1413	78	72	891	170
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	5	0	8	3	0	0	30	7	0	26	14
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	97	516	50	234	720	287	238	1754	102	88	1113	221
Peak Hour Factor	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	132	13	60	184	74	61	449	26	23	285	57
Total Analysis Volume [veh/h]	99	529	51	240	738	294	244	1797	105	90	1140	226
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	86.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	29	0	11	29	0	18	39	0	11	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	0	0	0	12	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	32	21	21	32	22	22	14	39	39	6	32	32
g / C, Green / Cycle	0.36	0.24	0.24	0.36	0.24	0.24	0.16	0.44	0.44	0.07	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.10	0.16	0.16	0.22	0.21	0.18	0.14	0.35	0.36	0.05	0.26	0.26
s, saturation flow rate [veh/h]	1000	1870	1813	1100	3560	1589	1781	3560	1818	1781	3560	1716
c, Capacity [veh/h]	330	440	427	387	860	384	283	1559	796	126	1246	600
d1, Uniform Delay [s]	21.86	31.29	31.30	22.92	32.72	31.82	36.98	22.01	22.09	41.01	25.71	25.71
k, delay calibration	0.11	0.11	0.11	0.20	0.11	0.12	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.50	1.76	1.83	2.95	2.62	3.69	7.71	4.55	8.78	7.32	3.97	7.98
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.30	0.67	0.67	0.62	0.86	0.77	0.86	0.81	0.81	0.71	0.74	0.74
d, Delay for Lane Group [s/veh]	22.36	33.05	33.13	25.87	35.34	35.51	44.68	26.57	30.87	48.33	29.69	33.70
Lane Group LOS	C	C	C	C	D	D	D	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.43	5.88	5.73	3.97	7.79	6.19	5.68	11.62	12.91	2.17	8.87	9.22
50th-Percentile Queue Length [ft/ln]	35.66	147.00	143.18	99.23	194.87	154.78	142.02	290.54	322.68	54.17	221.80	230.50
95th-Percentile Queue Length [veh/ln]	2.57	9.86	9.65	7.14	12.37	10.27	9.59	17.21	18.80	3.90	13.76	14.20
95th-Percentile Queue Length [ft/ln]	64.18	246.42	241.30	178.61	309.34	256.80	239.74	430.31	469.98	97.51	343.92	354.99

Movement, Approach, & Intersection Results

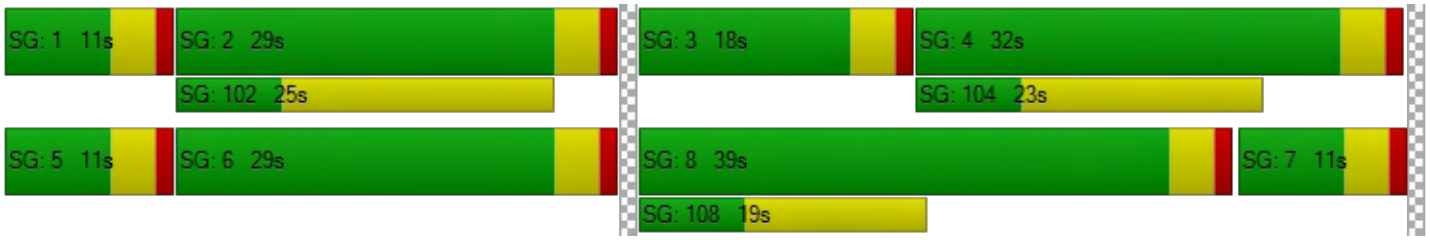
d_M, Delay for Movement [s/veh]	22.36	33.09	33.13	25.87	35.34	35.51	44.68	27.86	30.87	48.33	30.45	33.70
Movement LOS	C	C	C	C	D	D	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	31.53			33.59			29.92			32.06		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	31.52											
Intersection LOS	C											
Intersection V/C	0.807											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.614	2.821	0.000	3.257
Crosswalk LOS	B	C	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	556	556	778	622
d_b, Bicycle Delay [s]	23.47	23.47	16.81	21.36
l_b,int, Bicycle LOS Score for Intersection	2.120	2.609	2.740	2.360
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



APPENDIX D

Congestion Management Program
Level of Service Worksheets

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.662

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	511	198	53	345	101	104	864	67	239	1360	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	98	511	198	53	345	101	104	864	67	239	1360	101
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	128	50	13	86	25	26	216	17	60	340	25
Total Analysis Volume [veh/h]	98	511	198	53	345	101	104	864	67	239	1360	101
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.16	0.00	0.03	0.11	0.06	0.07	0.19	0.19	0.15	0.30	0.30
Intersection LOS	B											
Intersection V/C	0.662											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.754

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	73	495	277	80	499	97	84	1383	105	183	879	79
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	73	495	277	80	499	97	84	1383	105	183	879	79
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	124	69	20	125	24	21	346	26	46	220	20
Total Analysis Volume [veh/h]	73	495	277	80	499	97	84	1383	105	183	879	79
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	80
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.15	0.06	0.05	0.16	0.06	0.05	0.31	0.31	0.11	0.20	0.20
Intersection LOS	C											
Intersection V/C	0.754											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.664

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	511	198	53	345	101	104	864	67	239	1360	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	8	0	0	0	0	39	0	1	7	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	98	511	206	53	345	101	104	903	67	240	1367	101
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	128	52	13	86	25	26	226	17	60	342	25
Total Analysis Volume [veh/h]	98	511	206	53	345	101	104	903	67	240	1367	101
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.16	0.00	0.03	0.11	0.06	0.07	0.20	0.20	0.15	0.31	0.31
Intersection LOS	B											
Intersection V/C	0.664											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.761

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	73	495	277	80	499	97	84	1383	105	183	879	79
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	2	0	0	0	0	12	0	7	33	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	73	495	279	80	499	97	84	1395	105	190	912	79
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	124	70	20	125	24	21	349	26	48	228	20
Total Analysis Volume [veh/h]	73	495	279	80	499	97	84	1395	105	190	912	79
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	80
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.15	0.06	0.05	0.16	0.06	0.05	0.31	0.31	0.12	0.21	0.21
Intersection LOS	C											
Intersection V/C	0.761											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.684

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	511	198	53	345	101	104	864	67	239	1360	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	5	0	0	7	16	13	17	0	0	6	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	100	526	202	54	359	119	119	898	68	244	1393	103
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	132	51	14	90	30	30	225	17	61	348	26
Total Analysis Volume [veh/h]	100	526	202	54	359	119	119	898	68	244	1393	103
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.16	0.00	0.03	0.11	0.07	0.07	0.20	0.20	0.15	0.31	0.31
Intersection LOS	B											
Intersection V/C	0.684											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.772

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	73	495	277	80	499	97	84	1383	105	183	879	79
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	0	0	6	13	18	10	0	0	17	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	74	513	283	82	515	112	104	1421	107	187	914	81
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	128	71	21	129	28	26	355	27	47	229	20
Total Analysis Volume [veh/h]	74	513	283	82	515	112	104	1421	107	187	914	81
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	80
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.16	0.06	0.05	0.16	0.07	0.07	0.32	0.32	0.12	0.21	0.21
Intersection LOS	C											
Intersection V/C	0.772											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.686

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	511	198	53	345	101	104	864	67	239	1360	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	5	8	0	7	16	13	56	0	1	13	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	100	526	210	54	359	119	119	937	68	245	1400	103
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	132	53	14	90	30	30	234	17	61	350	26
Total Analysis Volume [veh/h]	100	526	210	54	359	119	119	937	68	245	1400	103
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.16	0.00	0.03	0.11	0.07	0.07	0.21	0.21	0.15	0.31	0.31
Intersection LOS	B											
Intersection V/C	0.686											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.779

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	73	495	277	80	499	97	84	1383	105	183	879	79
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	2	0	6	13	18	22	0	7	50	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	74	513	285	82	515	112	104	1433	107	194	947	81
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	128	71	21	129	28	26	358	27	49	237	20
Total Analysis Volume [veh/h]	74	513	285	82	515	112	104	1433	107	194	947	81
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	80
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.16	0.06	0.05	0.16	0.07	0.07	0.32	0.32	0.12	0.21	0.21
Intersection LOS	C											
Intersection V/C	0.779											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.797

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	511	198	53	345	101	104	864	67	239	1360	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	5	0	0	7	16	13	17	0	0	6	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	120	628	242	65	428	139	140	1071	82	292	1665	123
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	157	61	16	107	35	35	268	21	73	416	31
Total Analysis Volume [veh/h]	120	628	242	65	428	139	140	1071	82	292	1665	123
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.20	0.00	0.04	0.13	0.09	0.09	0.24	0.24	0.18	0.37	0.37
Intersection LOS	C											
Intersection V/C	0.797											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.872

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	73	495	277	80	499	97	84	1383	105	183	879	79
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	0	0	6	13	18	10	0	0	17	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	612	338	98	615	131	120	1697	128	223	1089	96
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	153	85	25	154	33	30	424	32	56	272	24
Total Analysis Volume [veh/h]	89	612	338	98	615	131	120	1697	128	223	1089	96
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.19	0.07	0.06	0.19	0.08	0.08	0.38	0.38	0.14	0.25	0.25
Intersection LOS	D											
Intersection V/C	0.872											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.798

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	511	198	53	345	101	104	864	67	239	1360	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	5	8	0	7	16	13	56	0	1	13	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	120	628	250	65	428	139	140	1110	82	293	1672	123
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	157	63	16	107	35	35	278	21	73	418	31
Total Analysis Volume [veh/h]	120	628	250	65	428	139	140	1110	82	293	1672	123
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.20	0.00	0.04	0.13	0.09	0.09	0.25	0.25	0.18	0.37	0.37
Intersection LOS	C											
Intersection V/C	0.798											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.879

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	73	495	277	80	499	97	84	1383	105	183	879	79
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	2	0	6	13	18	22	0	7	50	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	612	340	98	615	131	120	1709	128	230	1122	96
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	153	85	25	154	33	30	427	32	58	281	24
Total Analysis Volume [veh/h]	89	612	340	98	615	131	120	1709	128	230	1122	96
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.19	0.07	0.06	0.19	0.08	0.08	0.38	0.38	0.14	0.25	0.25
Intersection LOS	D											
Intersection V/C	0.879											

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July 5, 2019

Mr. Steven Christie, Development Manager
SIGNAL HILL XC, LLC
3010 Old Ranch Parkway, Suite 470
Seal Beach, CA 90740

RE: Signal Hill Business Center Supplemental Traffic Analysis
18-0056

Dear Mr. Christie:

INTRODUCTION

Ganddini Group is pleased to submit this Supplemental Traffic Analysis for the Signal Hill Business Center project. The purpose of this Supplemental Traffic Analysis is to evaluate the potential for additional project traffic impacts based on two additional thresholds not included in the Signal Hill Business Center Traffic Impact Analysis.

This traffic analysis supplements the Signal Hill Business Center Traffic Impact Analysis (Kunzman Associates, Inc., Final July 2019) ["Project Traffic Impact Analysis"] and the Supplemental Afternoon School Peak Hour Analysis (Kunzman Associates, Inc, May 31, 2018). The project site is generally bounded by Gundry Avenue to the west, Gundry Hill Apartments and American University of Health Sciences to the north, Gaviota Avenue to the east, and the Signal Hill City Limits and Alamitos Avenue to the south. The project site is currently vacant. The proposed project involves developing the project site with a business park consisting of nine buildings totaling 139,080 square feet plus 12,000 square feet of mezzanine, for a total of 151,080 square feet of gross floor area. Full access driveways are proposed at Gundry Avenue, Walnut Avenue, and Alamitos Avenue. The proposed project is anticipated to be constructed and fully operational by Year 2020.

Although this is a technical report, effort has been made to write the report clearly and concisely. To assist the reader with technical terms related to transportation engineering, a glossary is provided in Appendix A.

THRESHOLDS OF SIGNIFICANCE

Per City of Signal Hill traffic study criteria, the intersection mitigation requirement should include (all) following elements:

- Drop of 0.02 (2%) in LOS (ICU); or
- 40 vehicles added to an intersection; or
- Left-turn queue length is greater than the existing storage length.

As requested by City of Signal Hill staff, this Supplemental Traffic Analysis will address the second and third elements (40 vehicles added to an intersection and left-turn queue exceeds existing storage length).

ELEMENT 2 – 40 VEHICLES ADDED TO A STUDY INTERSECTION

Table 1 summarizes the number of project-generated trips forecast to be added at each study intersection within City of Signal Hill jurisdiction during the morning, school afternoon, and evening peak hours. Non-City of Signal Hill intersections are omitted since this threshold only applies to City of Signal Hill. The proposed project is forecast to contribute 40 or more peak hour trips at the following study intersections:

Orange Avenue (NS) at Willow Street (EW) - #2
This signalized intersection is forecast to operate at Level of Service F during the evening peak hour for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

Orange Avenue (NS) at Burnett Street (EW) - #3
This signalized intersection is forecast to operate at Level of Service C during the peak hours for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

Orange Avenue (NS) at Hill Street (EW) - #4
This signalized intersection is forecast to operate at Level of Service D or better during the peak hours for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

Gundry Avenue (NS) at Hill Street (EW) - #6
This unsignalized intersection is forecast to operate at Level of Service C or better during the peak hours for General Plan Buildout Without and With Project conditions. A traffic signal is not forecast to be warranted based on the peak hour volume traffic signal warrant (see Appendix B.)

Proposed Mitigation: N/A. Since the unsignalized intersection is forecast to operate within acceptable Level of Service and the peak hour traffic signal warrant is not satisfied, the project impact is considered less than significant and no mitigation is required.

Walnut Avenue (NS) at Hill Street (EW) - #10
This unsignalized intersection is forecast to operate at Level of Service C during the morning/evening peak hours and Level of Service E during the school afternoon peak hour only; however, a traffic signal is not forecast to be warranted (see Appendix B). As previously noted in the Supplemental Afternoon School Peak Hour Analysis (Kunzman Associates, Inc, May 31, 2018), extending the parking restriction on the northbound approach would effectively allow for operation of a right turn lane.

Proposed Mitigation: Extend the no parking restriction on the northbound approach to 100 feet south of the intersection. This will result in the loss of approximately two on-street parking spaces, but will allow for a de facto right turn lane.

Gaviota Avenue (NS) at Hill Street (EW) - #13
This unsignalized intersection is forecast to operate at Level of Service B during the peak hours for General Plan Buildout Without and With Project conditions A traffic signal is not forecast to be warranted based on the peak hour volume traffic signal warrant (see Appendix B.)

Proposed Mitigation: N/A. Since the unsignalized intersection is forecast to operate within acceptable Level of Service and the peak hour traffic signal warrant is not satisfied, the project impact is considered less than significant and no mitigation is required.

Cherry Avenue (NS) at Willow Street (EW) - #15
This signalized intersection is forecast to operate at Level of Service F during the evening peak hour for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

Cherry Avenue (NS) at Burnett Street (EW) - #16
This signalized intersection is forecast to operate at Level of Service C during the peak hours for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

Cherry Avenue (NS) at Hill Street (EW) - #17
This signalized intersection is forecast to operate at Level of Service C during the peak hours for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

ELEMENT 3 – LEFT-TURN QUEUE EXCEEDS STORAGE LENGTH

Table 2 summarizes the existing left-turn storage lengths and the corresponding queue length during the morning, school afternoon (where applicable), and evening peak hours for study intersections within City of Signal Hill jurisdiction where the project is forecast to add trips to the left turn movement. Non-City of Signal Hill intersections are omitted since this threshold only applies to City of Signal Hill. The queue length was calculated in accordance with the Highway Capacity Manual, 6th Edition back of queue methodology for the 95th-percentile queue length. Queue worksheets are provided in Appendix C.

As shown in Table 2, adequate left-turn storage is forecast to be provided at the City of Signal Hill study intersections where the proposed project is forecast to increase the left-turn volume during the peak hours for Opening Year (2020) With Project conditions.

As also shown in Table 2, adequate left-turn storage is forecast to be provided at the City of Signal Hill study intersections where the proposed project is forecast to increase the left-turn volume during the peak hours for General Plan Buildout (Year 2040) With Project conditions, with exception of the southbound left turn at Orange Avenue/Hill Street and the westbound left turn at Cherry Avenue/Willow Street.

Orange Avenue (NS) at Hill Street (EW) - #4
Southbound left-turn storage length is forecast to be exceeded during the morning peak hour for General Plan Buildout (Year 2040) With Project conditions. It should be noted that there is additional storage available within the painted median to accommodate the additional queue.

Proposed Mitigation: If necessary, extend the southbound left turn lane striping to provide 250 feet of storage length (including bay taper).

Cherry Avenue (NS) at Willow Street (EW) - #15
Westbound left-turn storage length is forecast to be exceeded during the evening peak hour for General Plan Buildout (Year 2040) With Project conditions. The existing left-turn lane storage is approximately 200 feet for dual left turn lanes plus a left-turn bay taper of approximately 120 feet.

Proposed Mitigation: Modify the westbound raised median to accommodate 250 feet of storage length for dual left turn lanes plus a left-turn bay taper of approximately 120 feet.

FAIR SHARE IMPROVEMENT COSTS

Figure 3 shows a summary of project fair share percentages at each of the intersection improvement locations. Fair share percentages were determined based on the following formula:

$$\text{Project Fair Share} = \text{Improvement Cost} \times \frac{\text{Project Trips}}{\text{New Traffic}\ (\text{Future Traffic} - \text{Existing Traffic})}$$

Table 4 shows the cost estimate for off-site improvements. These cost estimates are intended for informational purposes only and do not imply any legal responsibility or formula for contributions or mitigation. As shown in Table 4, the total project share of estimated off-site improvement costs is $6,016.

SUMMARY

The proposed project should contribute towards updated signal timing at the following study intersections:

- Orange Avenue (NS) at Willow Street (EW) - #2
- Orange Avenue (NS) at Burnett Street (EW) - #3
- Orange Avenue (NS) at Hill Street (EW) - #4
- Cherry Avenue (NS) at Willow Street (EW) - #15
- Cherry Avenue (NS) at Burnett Street (EW) - #16
- Cherry Avenue (NS) at Hill Street (EW) - #17

Additionally, the project should contribute towards its share of costs for the following improvements:

Orange Avenue (NS) at Hill Street (EW) - #4
If necessary, extend the southbound left turn lane striping to provide 250 feet of storage length (including bay taper).

Mr. Steven Christie
SIGNAL HILL XC, LLC
July 5, 2019

Walnut Avenue (NS) at Hill Street (EW) - #10
Extend the no parking restriction on the northbound approach to 100 feet south of the intersection. This will result in the loss of approximately two on-street parking spaces, but will allow for a de facto right turn lane.

Cherry Avenue (NS) at Willow Street (EW) - #15
Modify the westbound raised median to accommodate 250 feet of storage length for dual left turn lanes plus a left-turn bay taper of approximately 120 feet.

CONCLUSION

We appreciate the opportunity to assist you on this project. Should you have any questions or if we can be of further assistance, please do not hesitate to call at (714) 795-3100.

Sincerely,

Giancarlo Ganddini, PE, PTP
Principal



Table 1
Project Trip Contribution

ID	Study Intersection	Jurisdiction[1]	Peak Hour Project Trips		40 or More Trips Added?	Mitigation Required?
			Morning	School PM/ Evening		
1.	Orange Ave at Spring St	SH/LB	36	37	No	No
2.	Orange Ave at Willow St	SH/LB	60	62	Yes	Yes - update signal timing.
3.	Orange Ave at Burnett St	SH	60	62	Yes	Yes - update signal timing.
4.	Orange Ave at Hill St	SH/LB	69	71	Yes	Yes - update signal timing.
6.	Gundry Ave at Hill St	SH	71	72	Yes	No[2]
7.	Walnut Ave at Spring St	SH/LB	9	9	No	No
8.	Walnut Ave at Willow St	SH	9	9	No	No
9.	Walnut Ave at Burnett St	SH	9	9	No	No
10.	Walnut Ave at Hill St	SH	95	93	Yes	Yes - update signal timing.
13.	Gaviota Ave at Hill St	SH	64	62	Yes	No[2]
14.	Cherry Ave at Spring St	SH/LB	28	29	No	No
15.	Cherry Ave at Willow St	SH	79	78	Yes	Yes - update signal timing.
16.	Cherry Ave at Burnett St	SH	79	78	Yes	Yes - update signal timing.
17.	Cherry Ave at Hill St	SH	79	78	Yes	Yes - update signal timing.
18.	Cherry Ave at 21st St	SH	15	16	No	No
19.	Cherry Ave at 20th St	SH	0	0	No	No

Notes:

(1) SH = City of Signal Hill; LB = City of Long Beach

(2) Since the unsignalized intersection is forecast to operate within acceptable Level of Service and the peak hour traffic signal warrant is not satisfied, the project impact is considered less than significant and no mitigation is required.

Table 2
Left-Turn Lane Queue Lengths

ID	Study Intersection	Movement[1]	Storage Length[2]	Opening Year (2020) With Project			
				95th-Percentile Queue Length (Feet)			Adequate Storage Length?
				Morning	School PM	Evening	
2.	Orange Ave at Willow St	NBL	145+	46	n/a	47	Yes
4.	Orange Ave at Hill St	SBL	225+	219	84	86	Yes
14.	Cherry Ave at Spring St	WBL	215+	138	n/a	120	Yes
15.	Cherry Ave at Willow St	WBL	225	167	n/a	201	Yes

ID	Study Intersection	Movement[1]	Storage Length[2]	General Plan Buildout (Year 2040) With Project			
				95th-Percentile Queue Length (Feet)			Adequate Storage Length?
				Morning	School PM	Evening	
2.	Orange Ave at Willow St	NBL	145+	66	n/a	59	Yes
4.	Orange Ave at Hill St	SBL	225+	240	98	104	No
14.	Cherry Ave at Spring St	WBL	215+	162	n/a	140	Yes
15.	Cherry Ave at Willow St	WBL	225	195	n/a	276	No

Table 3
Project Fair Share Percentage

ID	Study Intersection	Peak Hour	Existing Volume	General Plan Buildout Volume	Total New Volume	Project Trips	Project % of New Traffic
2.	Orange Ave at Willow St	Morning	3,574	4,507	933	60	6.4%
		Evening	4,159	5,235	1,076	62	5.8%
3.	Orange Ave at Burnett St	Morning	1,537	1,999	462	60	13.0%
		Evening	1,521	1,988	467	62	13.3%
4.	Orange Ave at Hill St	Morning	1,742	2,260	518	69	13.3%
		School PM	1,683	2,195	512	71	13.9%
		Evening	1,641	2,142	501	71	14.2%
10.	Walnut Ave at Hill St	Morning	805	1,098	293	95	32.4%
		School PM	951	1,269	318	93	29.2%
		Evening	859	1,156	297	93	31.3%
15.	Cherry Ave at Willow St	Morning	4,989	6,283	1,294	79	6.1%
		Evening	5,804	7,286	1,482	78	5.3%
16.	Cherry Ave at Burnett St	Morning	2,609	3,311	702	79	11.3%
		Evening	2,852	3,611	759	78	10.3%
17.	Cherry Ave at Hill St	Morning	2,388	3,042	654	79	12.1%
		Evening	2,600	3,302	702	78	11.1%

Table 4
Cost Estimate and Project Fair Share

ID	Study Intersection	Improvement	Cost Estimate	Project % of New Traffic[1]	Project Fair Share of Cost
2.	Orange Ave at Willow St	- Update signal timing[2]	$ 5,000	6.4%	$ 322
3.	Orange Ave at Burnett St	- Update signal timing	$ 5,000	13.3%	$ 664
4.	Orange Ave at Hill St	- Update signal timing - Extend the southbound left turn lane striping to provide 250 feet of storage length (including bay taper).[3]	$ 5,000 $ 3,750	14.2%	$ 1,240
10.	Walnut Ave at Hill St	- Extend the no parking restriction on the northbound approach to 100 feet south of the intersection. This will result in the loss of approximately two on-street parking spaces, but will allow for a de facto right turn lane.	$ 1,500	32.4%	$ 486
15.	Cherry Ave at Willow St	- Update signal timing - Modify the westbound raised median to accommodate 250 feet of storage length for dual left turn lanes plus a left-turn bay taper of approximately 120 feet.[4]	$ 5,000 $ 30,000	6.1%	$ 2,137
16.	Cherry Ave at Burnett St	- Update signal timing	$ 5,000	11.3%	$ 563
17.	Cherry Ave at Hill St	- Update signal timing	$ 5,000	12.1%	$ 604
TOTAL			$ 65,250		$ 6,016

Notes:

(1) Based on greater of morning, school afternoon, or evening peak hour share from Table 3.

(2) Source: National Traffic Signal Report Card: Technical Report 2005, National Transportation Operations Coalition (http://www.ite.org/reportcard/NTS_TechReport.pdf)

(3) Cost to remove and add striping is estimated at $15 per linear foot.

(4) https://safety.fhwa.dot.gov/saferjourney1/Library/countermeasures/16.htm

APPENDIX A

GLOSSARY

GLOSSARY OF TERMS

ACRONYMS

AC	Acres
ADT	Average Daily Traffic
Caltrans	California Department of Transportation
DU	Dwelling Unit
ICU	Intersection Capacity Utilization
LOS	Level of Service
TSF	Thousand Square Feet
V/C	Volume/Capacity
VMT	Vehicle Miles Traveled

TERMS

AVERAGE DAILY TRAFFIC: The average 24-hour volume for a stated period divided by the number of days in that period. For example, Annual Average Daily Traffic is the total volume during a year divided by 365 days.

BANDWIDTH: The number of seconds of green time available for through traffic in a signal progression.

BOTTLENECK: A point of constriction along a roadway that limits the amount of traffic that can proceed downstream from its location.

CAPACITY: The maximum number of vehicles that can be reasonably expected to pass over a given section of a lane or a roadway in a given time period.

CHANNELIZATION: The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movements of both vehicles and pedestrians.

CLEARANCE INTERVAL: Nearly same as yellow time. If there is an all red interval after the end of a yellow, then that is also added into the clearance interval.

CONTROL DELAY: The component of delay, typically expressed in seconds per vehicle, resulting from the type of traffic control at an intersection. Control delay is measured by comparison with the uncontrolled condition; it includes delay incurred by slowing down, stopping/waiting, and speeding up.

CORDON: An imaginary line around an area across which vehicles, persons, or other items are counted (in and out).

CORNER SIGHT DISTANCE: The minimum sight distance required by the driver of a vehicle to cross or enter the lanes of the major roadway without requiring approaching traffic travelling at a given speed to radically alter their speed or trajectory. Corner sight distance is measured from the driver's eye at 42 inches above the pavement to an object height of 36 inches above the pavement in the center of the nearest approach lane.

CYCLE LENGTH: The time period in seconds required for a traffic signal to complete one full cycle of indications.

CUL-DE-SAC: A local street open at one end only and with special provisions for turning around.

DAILY CAPACITY: A theoretical value representing the daily traffic volume that will typically result in a peak hour volume equal to the capacity of the roadway.

DELAY: The time consumed while traffic is impeded in its movement by some element over which it has no control, usually expressed in seconds per vehicle.

DEMAND RESPONSIVE SIGNAL: Same as traffic-actuated signal.

DENSITY: The number of vehicles occupying in a unit length of the through traffic lanes of a roadway at any given instant. Usually expressed in vehicles per mile.

DETECTOR: A device that responds to a physical stimulus and transmits a resulting impulse to the signal controller.

DESIGN SPEED: A speed selected for purposes of design. Features of a highway, such as curvature, superelevation, and sight distance (upon which the safe operation of vehicles is dependent) are correlated to design speed.

DIRECTIONAL SPLIT: The percent of traffic in the peak direction at any point in time.

DIVERSION: The rerouting of peak hour traffic to avoid congestion.

FORCED FLOW: Opposite of free flow.

FREE FLOW: Volumes are well below capacity. Vehicles can maneuver freely and travel is unimpeded by other traffic.

GAP: Time or distance between successive vehicles in a traffic stream, rear bumper to front bumper.

HEADWAY: Time or distance spacing between successive vehicles in a traffic stream, front bumper to front bumper.

INTERCONNECTED SIGNAL SYSTEM: A number of intersections that are connected to achieve signal progression.

LEVEL OF SERVICE: A qualitative measure of a number of factors, which include speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs.

LOOP DETECTOR: A vehicle detector consisting of a loop of wire embedded in the roadway, energized by alternating current and producing an output circuit closure when passed over by a vehicle.

MINIMUM ACCEPTABLE GAP: Smallest time headway between successive vehicles in a traffic stream into which another vehicle is willing and able to cross or merge.

MULTI-MODAL: More than one mode; such as automobile, bus transit, rail rapid transit, and bicycle transportation modes.

OFFSET: The time interval in seconds between the beginning of green at one intersection and the beginning of green at an adjacent intersection.

PLATOON: A closely grouped component of traffic that is composed of several vehicles moving, or standing ready to move, with clear spaces ahead and behind.

PASSENGER CAR EQUIVALENT (PCE): A metric used to assess the impact of larger vehicles, such as trucks, recreational vehicles, and buses, by converting the traffic volume of larger vehicles to an equivalent number of passenger cars.

PEAK HOUR: The 60 consecutive minutes with the highest number of vehicles.

PRETIMED SIGNAL: A type of traffic signal that directs traffic to stop and go on a predetermined time schedule without regard to traffic conditions. Also, fixed time signal.

PROGRESSION: A term used to describe the progressive movement of traffic through several signalized intersections.

QUEUE: The number of vehicles waiting at a service area such as a traffic signal, stop sign, or access gate.

QUEUE LENGTH: The length of vehicle queue, typically expressed in feet, waiting at a service area such as a traffic signal, stop sign, or access gate.

SCREEN-LINE: An imaginary line or physical feature across which all trips are counted, normally to verify the validity of mathematical traffic models.

SHARED/RECIPROCAL PARKING AGREEMENT: A written binding document executed between property owners to provide a designated number of off-street parking stalls within a designated area to be available for specified businesses or land uses.

SIGHT DISTANCE: The continuous length of roadway visible to a driver or roadway user.

SIGNAL CYCLE: The time period in seconds required for one complete sequence of signal indications.

SIGNAL PHASE: The part of the signal cycle allocated to one or more traffic movements.

STACKING DISTANCE: The length of area available behind a service area, such as a traffic signal or gate, for vehicle queueing to occur.

STARTING DELAY: The delay experienced in initiating the movement of queued traffic from a stop to an average running speed through an intersection.

STOPPING SIGHT DISTANCE: The minimum distance required by the driver of a vehicle on the major roadway travelling at a given speed to bring the vehicle to a stop after an object on the road becomes visible. Stopping sight distance is measured from the driver's eye at 42 inches above the pavement to an object height of 6 inches above the pavement.

TRAFFIC-ACTUATED SIGNAL: A type of traffic signal that directs traffic to stop and go in accordance with the demands of traffic, as registered by the actuation of detectors.

TRIP: The movement of a person or vehicle from one location (origin) to another (destination). For example, from home to store to home is two trips, not one.

TRIP-END: One end of a trip at either the origin or destination (i.e., each trip has two trip-ends). A trip-end occurs when a person, object, or message is transferred to or from a vehicle.

TRIP GENERATION RATE: The quantity of trips produced and/or attracted by a specific land use stated in terms of units such as per dwelling, per acre, and per 1,000 square feet of floor space.

TRUCK: A vehicle having dual tires on one or more axles, or having more than two axles.

TURNING RADIUS: The circular arc formed by the smallest turning path radius of the front outside tire of a vehicle, such as that performed by a U-turn maneuver. This is based on the length and width of the wheel base as well as the steering mechanism of the vehicle.

UNBALANCED FLOW: Heavier traffic flow in one direction than the other. On a daily basis, most facilities have balanced flow. During the peak hours, flow is seldom balanced in an urban area.

VEHICLE MILES OF TRAVEL: A measure of the amount of usage of a section of highway, obtained by multiplying the average daily traffic by length of facility in miles.

APPENDIX B

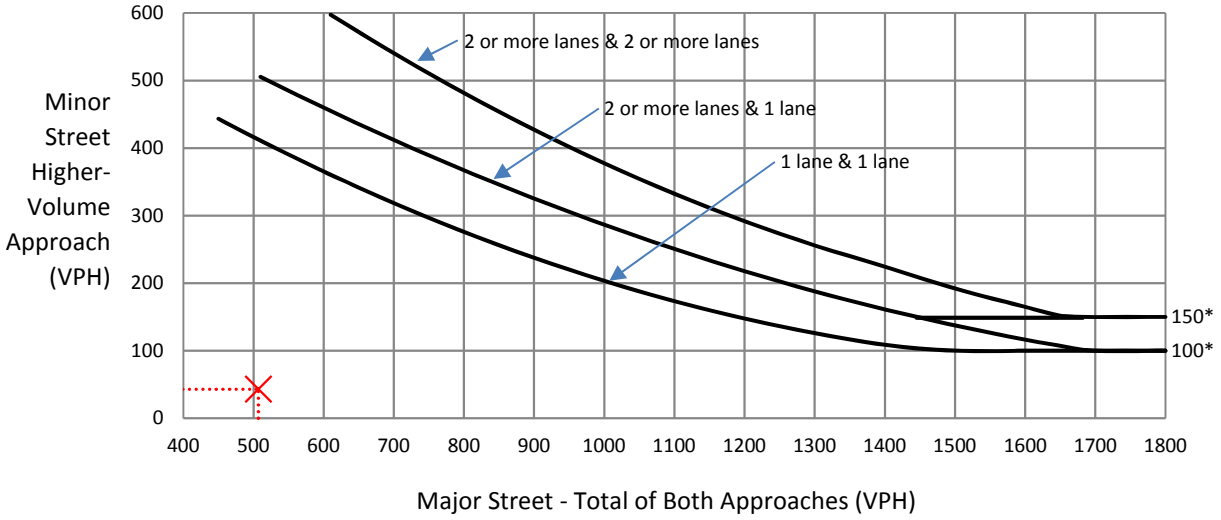
TRAFFIC SIGNAL WARRANT WORKSHEETS

Figure C-1

Gundry Ave (NS) / Hill St (EW) - #6
General Plan Buildout With Project
AM Peak Hour

Major Street:	Hill St	Volume:	507
Minor Street:	Gundry Ave	Volume:	43

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

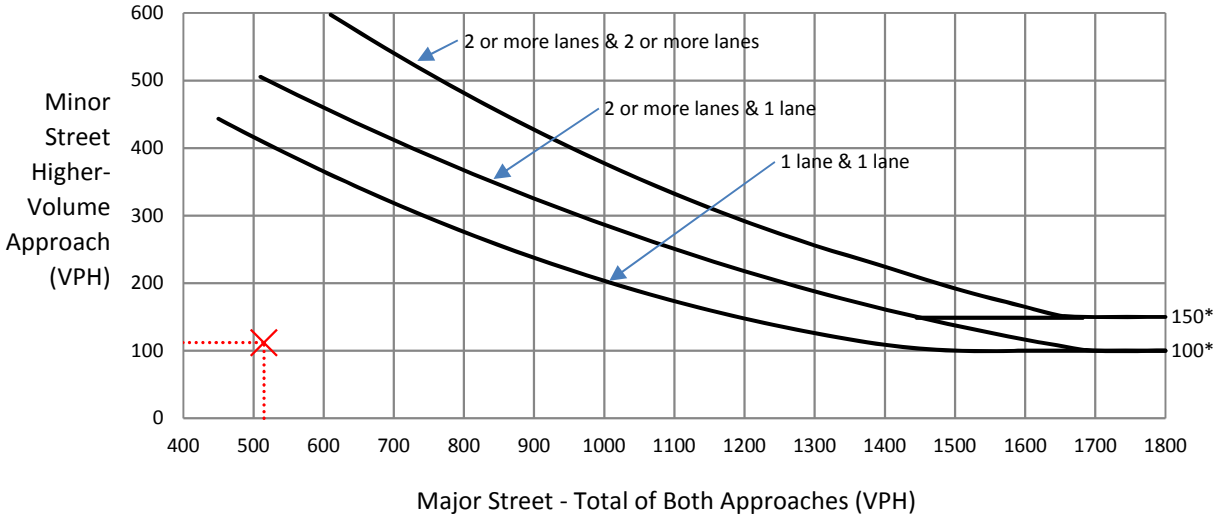
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-2

Gundry Ave (NS) / Hill St (EW) - #6
General Plan Buildout With Project
School PM Peak Hour

Major Street:	Hill St	Volume:	515
Minor Street:	Gundry Ave	Volume:	112

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

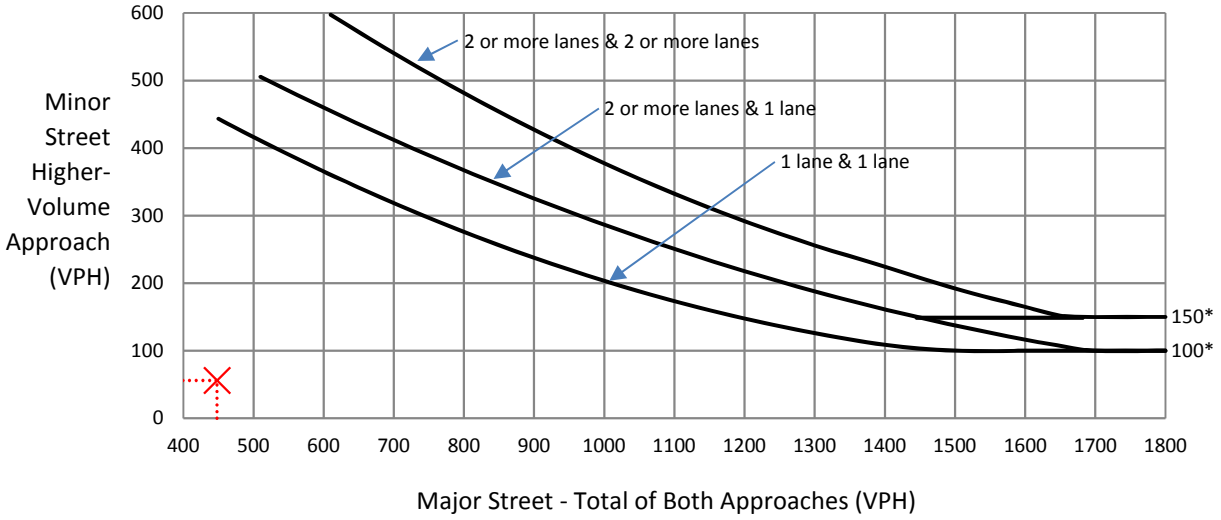
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-3

Gundry Ave (NS) / Hill St (EW) - #6
General Plan Buildout With Project
PM Peak Hour

Major Street:	Hill St	Volume:	448
Minor Street:	Gundry Ave	Volume:	56

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

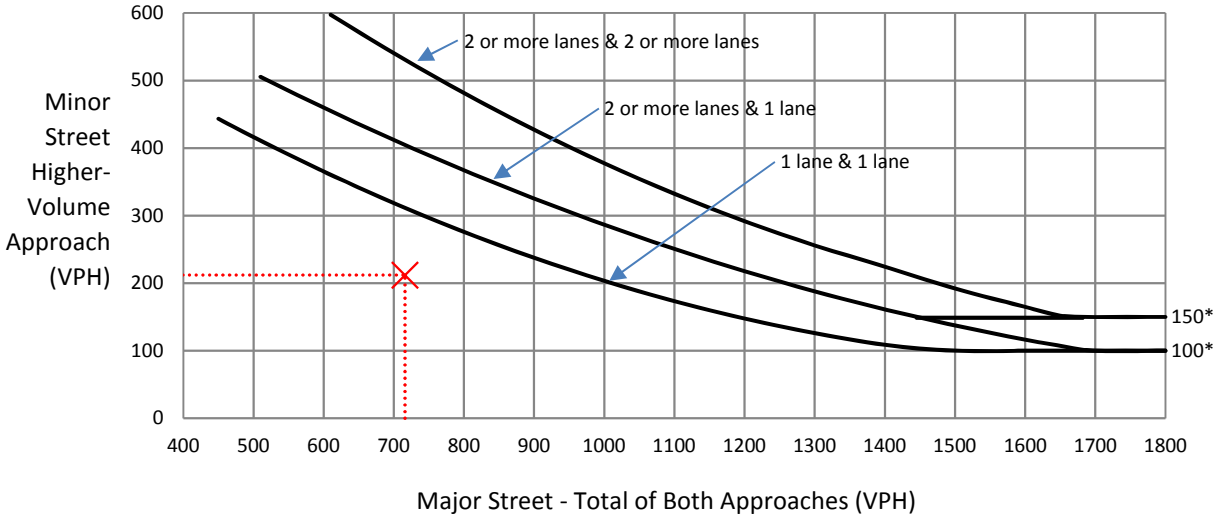
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-4

Walnut Ave (NS) / Hill St (EW) - #10
General Plan Buildout With Project
AM Peak Hour

Major Street:	Walnut Ave	Volume:	716
Minor Street:	Hill St	Volume:	212

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

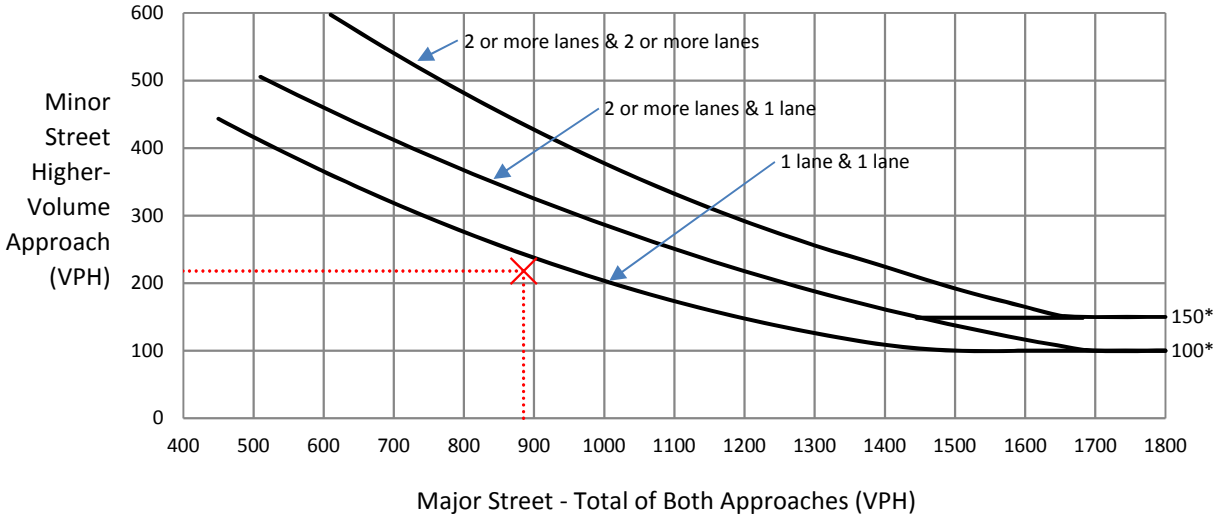
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-5

Walnut Ave (NS) / Hill St (EW) - #10
General Plan Buildout With Project
School PM Peak Hour

Major Street:	Walnut Ave	Volume:	885
Minor Street:	Hill St	Volume:	218

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

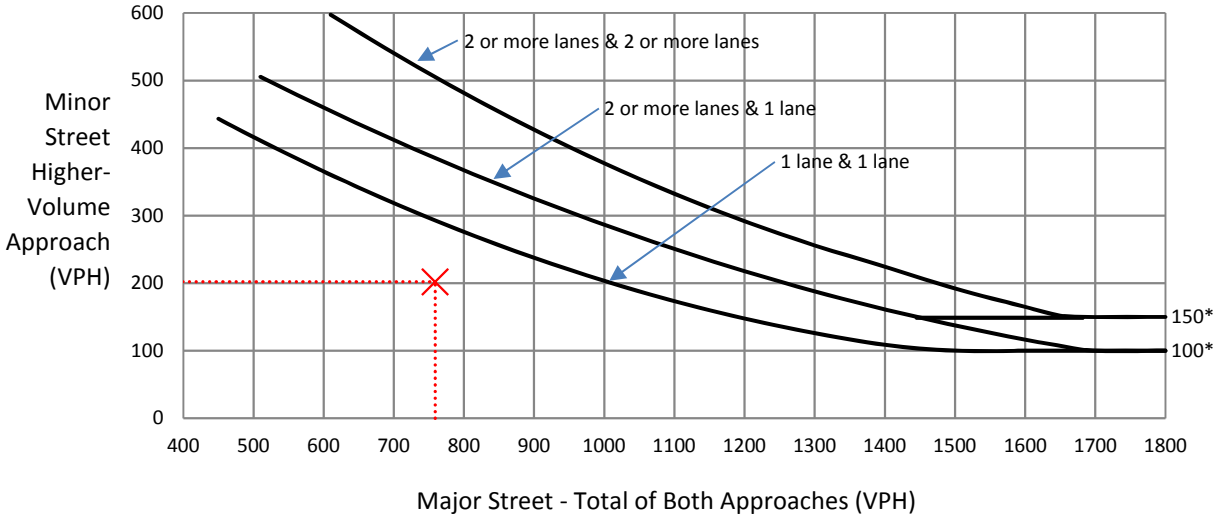
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-6

Walnut Ave (NS) / Hill St (EW) - #10
General Plan Buildout With Project
PM Peak Hour

Major Street:	Walnut Ave	Volume:	759
Minor Street:	Hill St	Volume:	202

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

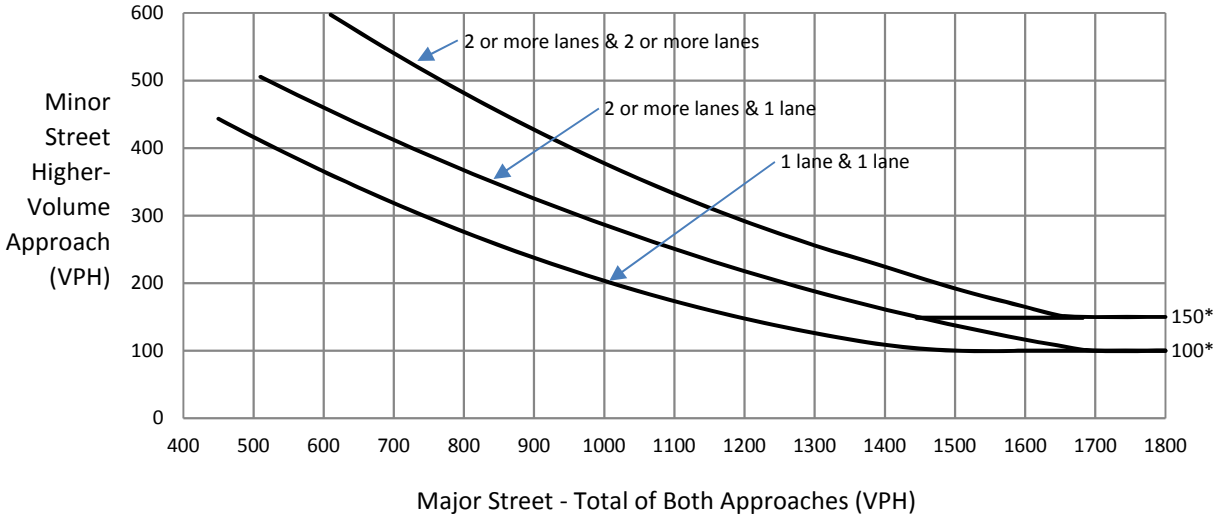
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-7

Gaviota Ave (NS) / Hill St (EW) - #13
General Plan Buildout With Project
AM Peak Hour

Major Street:	Hill St	Volume:	374
Minor Street:	Gaviota Ave	Volume:	45

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

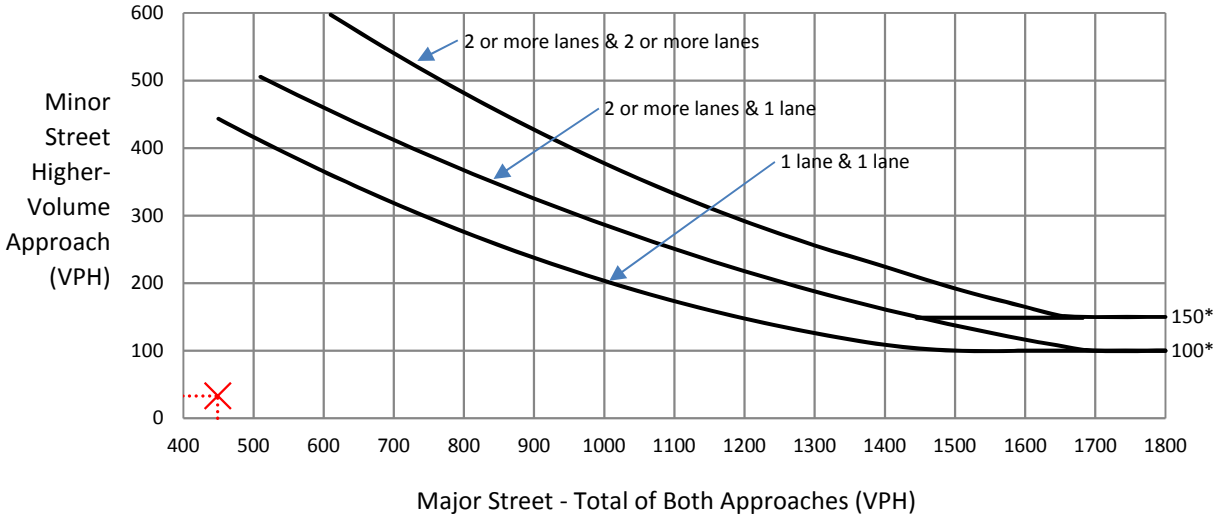
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-8

Gaviota Ave (NS) / Hill St (EW) - #13
General Plan Buildout With Project
PM Peak Hour

Major Street:	Hill St	Volume:	449
Minor Street:	Gaviota Ave	Volume:	33

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

APPENDIX C

HCM QUEUE LENGTH WORKSHEETS

Opening Year (2020) With Project

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	32.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.625

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	82	492	92	40	439	83	84	931	72	69	1128	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	12	0	8	36	2	4	30	21	0	16	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	514	94	49	484	87	90	980	94	70	1167	76
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	129	24	12	121	22	23	245	24	18	292	19
Total Analysis Volume [veh/h]	89	514	94	49	484	87	90	980	94	70	1167	76
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	31	0	11	31	0	31	46	0	12	27	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	55	45	55	44	44	7	27	27	6	27	27
g / C, Green / Cycle	0.55	0.45	0.55	0.44	0.44	0.07	0.27	0.27	0.06	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.08	0.27	0.05	0.25	0.05	0.05	0.20	0.20	0.04	0.23	0.23
s, saturation flow rate [veh/h]	1064	1900	1023	1900	1615	1810	3618	1816	1810	3618	1841
c, Capacity [veh/h]	502	858	473	836	710	119	993	498	110	975	496
d1, Uniform Delay [s]	13.14	20.64	13.07	21.08	16.61	45.99	32.85	32.87	45.92	34.58	34.59
k, delay calibration	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.77	3.08	0.09	2.92	0.35	9.35	1.00	1.99	5.89	2.10	4.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.18	0.60	0.10	0.58	0.12	0.76	0.72	0.72	0.63	0.84	0.84
d, Delay for Lane Group [s/veh]	13.91	23.72	13.17	24.01	16.96	55.34	33.85	34.86	51.81	36.69	38.71
Lane Group LOS	B	C	B	C	B	E	C	C	D	D	D
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.02	9.42	0.50	8.90	1.23	2.50	7.84	8.03	1.87	9.58	10.03
50th-Percentile Queue Length [ft/ln]	25.50	235.41	12.59	222.39	30.83	62.42	195.98	200.64	46.81	239.46	250.80
95th-Percentile Queue Length [veh/ln]	1.84	14.45	0.91	13.79	2.22	4.49	12.43	12.67	3.37	14.65	15.23
95th-Percentile Queue Length [ft/ln]	45.90	361.22	22.65	344.68	55.50	112.36	310.78	316.79	84.25	366.35	380.67

Movement, Approach, & Intersection Results

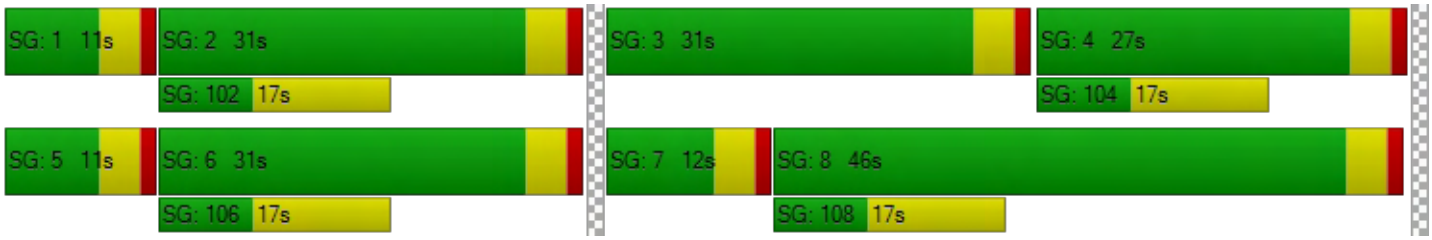
d_M, Delay for Movement [s/veh]	13.91	23.72	0.00	13.17	24.01	16.96	55.34	34.13	34.86	51.81	37.28	38.71
Movement LOS	B	C		B	C	B	E	C	C	D	D	D
d_A, Approach Delay [s/veh]	22.27			22.16			35.83			38.14		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	32.15											
Intersection LOS	C											
Intersection V/C	0.625											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.549	2.558	3.006	2.958
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	540	540	840	460
d_b, Bicycle Delay [s]	26.65	26.65	16.82	29.65
l_b,int, Bicycle LOS Score for Intersection	2.555	2.583	2.200	2.282
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	341.3
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	3.755

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	40	667	22	28	526	25	78	90	38	47	124	57
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	3	54	19	9	6	9	0	4	2	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	41	695	25	83	556	35	86	101	39	52	128	71
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	174	6	21	139	9	22	25	10	13	32	18
Total Analysis Volume [veh/h]	41	695	25	83	556	35	86	101	39	52	128	71
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	24	0	0	24	0	0	76	0	0	76	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	20	20	20	20	72	72	72	72
g / C, Green / Cycle	0.20	0.20	0.20	0.20	0.72	0.72	0.72	0.72
(v / s)_i Volume / Saturation Flow Rate	0.05	0.38	0.11	0.31	3.00	0.02	1.38	0.04
s, saturation flow rate [veh/h]	839	1888	744	1880	62	1615	130	1615
c, Capacity [veh/h]	72	381	72	379	97	1160	140	1160
d1, Uniform Delay [s]	50.00	39.92	50.00	39.92	32.94	4.06	37.36	4.15
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	28.63	410.77	153.09	264.12	449.81	0.01	171.35	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.57	1.89	1.15	1.56	1.92	0.03	1.28	0.06
d, Delay for Lane Group [s/veh]	78.63	450.69	203.09	304.04	482.74	4.08	208.71	4.17
Lane Group LOS	E	F	F	F	F	A	F	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	1.59	52.65	4.86	36.99	13.11	0.20	8.83	0.37
50th-Percentile Queue Length [ft/ln]	39.86	1316.37	121.42	924.65	327.80	5.01	220.86	9.30
95th-Percentile Queue Length [veh/ln]	2.87	81.97	8.74	56.86	23.60	0.36	15.90	0.67
95th-Percentile Queue Length [ft/ln]	71.75	2049.37	218.55	1421.53	590.04	9.01	397.55	16.75

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	78.63	450.69	450.69	203.09	304.04	304.04	482.74	482.74	4.08	208.71	208.71	4.17
Movement LOS	E	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	430.64			291.61			400.14			150.85		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	341.30											
Intersection LOS	F											
Intersection V/C	3.755											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.553	2.630	2.143	2.213
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	400	400	1440	1440
d_b, Bicycle Delay [s]	32.00	32.00	3.92	3.92
l_b,int, Bicycle LOS Score for Intersection	2.815	2.672	1.933	1.974
Bicycle LOS	C	B	A	A

Sequence

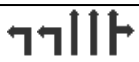
Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	33.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.685

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	86	1069	170	281	1098	137	120	544	75	105	1052	358
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	21	1	0	46	0	0	1	8	5	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	90	1111	174	287	1166	140	122	556	85	112	1074	365
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	278	44	72	292	35	31	139	21	28	269	91
Total Analysis Volume [veh/h]	90	1111	174	287	1166	140	122	556	85	112	1074	365
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	23	39	0	17	33	0	13	21	0	23	31	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	39	39	13	45	45	8	24	24	8	24	24	24
g / C, Green / Cycle	0.06	0.39	0.39	0.13	0.45	0.45	0.08	0.24	0.24	0.08	0.24	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.05	0.24	0.24	0.11	0.24	0.24	0.07	0.12	0.12	0.06	0.20	0.20	0.20
s, saturation flow rate [veh/h]	1810	3618	1771	2663	3618	1798	1810	3618	1775	1810	3618	1867	1615
c, Capacity [veh/h]	118	1418	694	338	1640	815	153	875	429	144	857	442	383
d1, Uniform Delay [s]	46.02	24.30	24.30	42.79	19.71	19.71	45.00	32.65	32.71	45.22	36.57	36.57	36.57
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.21	0.21
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.56	1.95	3.94	5.98	1.24	2.48	9.15	0.43	0.89	8.69	2.58	9.02	10.29
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.76	0.61	0.61	0.85	0.53	0.53	0.80	0.49	0.50	0.78	0.86	0.86	0.86
d, Delay for Lane Group [s/veh]	55.58	26.25	28.24	48.76	20.95	22.20	54.16	33.07	33.60	53.90	39.15	45.58	46.86
Lane Group LOS	E	C	C	D	C	C	D	C	C	D	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.50	8.32	8.53	3.72	7.35	7.59	3.34	4.46	4.51	3.06	8.72	9.80	8.61
50th-Percentile Queue Length [ft/ln]	62.58	207.98	213.31	93.05	183.83	189.83	83.56	111.53	112.71	76.49	218.1	244.9	215.3
95th-Percentile Queue Length [veh/ln]	4.51	13.05	13.32	6.70	11.80	12.11	6.02	7.93	7.99	5.51	13.57	14.93	13.43
95th-Percentile Queue Length [ft/ln]	112.64	326.23	333.08	167.50	295.01	302.81	150.40	198.13	199.76	137.6	339.2	373.2	335.7

Movement, Approach, & Intersection Results

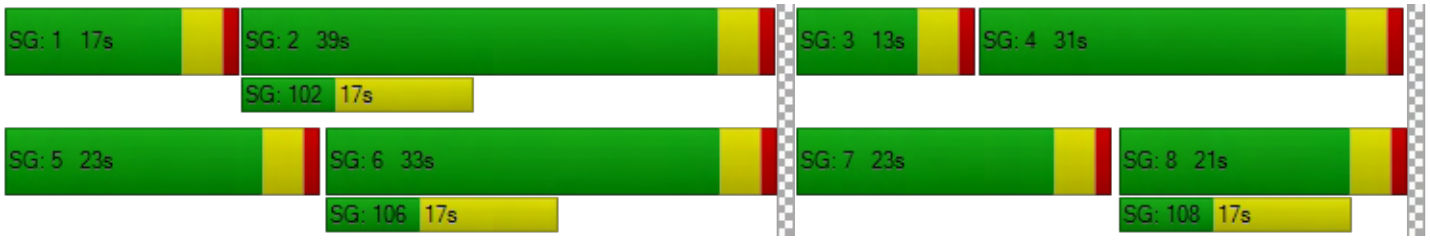
d_M, Delay for Movement [s/veh]	55.58	26.70	28.24	48.76	21.26	22.20	54.16	33.19	33.60	53.90	41.19	46.84
Movement LOS	E	C	C	D	C	C	D	C	C	D	D	D
d_A, Approach Delay [s/veh]	28.78			26.30			36.59			43.41		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	33.46											
Intersection LOS	C											
Intersection V/C	0.685											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	0.00	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.064	0.000	2.887	3.043
Crosswalk LOS	C	F	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	700	580	340	540
d_b, Bicycle Delay [s]	21.13	25.21	34.45	26.65
l_b,int, Bicycle LOS Score for Intersection	2.316	2.436	1.979	2.413
Bicycle LOS	B	B	A	B

Sequence

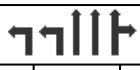
Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	35.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.643

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	167	1031	161	149	765	147	177	836	85	231	1124	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	24	28	31	0	1	28	0	51	10	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	170	1067	188	180	811	150	182	881	87	287	1156	126
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	43	267	47	45	203	38	46	220	22	72	289	32
Total Analysis Volume [veh/h]	170	1067	188	180	811	150	182	881	87	287	1156	126
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	33	41	41	13	21	0	13	29	0	17	33	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	40	57	9	37	37	9	23	23	13	27	27
g / C, Green / Cycle	0.11	0.40	0.57	0.09	0.37	0.37	0.09	0.23	0.23	0.13	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.09	0.21	0.12	0.07	0.18	0.18	0.07	0.18	0.18	0.11	0.24	0.24
s, saturation flow rate [veh/h]	1810	5176	1615	2663	3618	1752	2663	3618	1814	2663	3618	1806
c, Capacity [veh/h]	208	2077	918	231	1350	654	233	814	408	339	957	478
d1, Uniform Delay [s]	43.28	22.61	10.55	44.78	23.96	23.98	44.75	36.60	36.61	42.75	35.47	35.47
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.15	0.11	0.11	0.30
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.64	0.91	0.50	5.60	1.22	2.52	5.62	1.78	4.95	5.87	3.19	14.41
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	0.51	0.20	0.78	0.48	0.48	0.78	0.79	0.79	0.85	0.89	0.89
d, Delay for Lane Group [s/veh]	50.92	23.52	11.06	50.38	25.18	26.50	50.36	38.38	41.57	48.63	38.66	49.88
Lane Group LOS	D	C	B	D	C	C	D	D	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	4.52	6.34	2.07	2.35	5.95	6.03	2.38	7.51	7.91	3.72	10.25	11.72
50th-Percentile Queue Length [ft/ln]	112.96	158.40	51.70	58.82	148.76	150.67	59.47	187.75	197.72	92.91	256.15	293.06
95th-Percentile Queue Length [veh/ln]	8.00	10.46	3.72	4.23	9.95	10.05	4.28	12.00	12.52	6.69	15.50	17.34
95th-Percentile Queue Length [ft/ln]	200.11	261.61	93.07	105.87	248.77	251.32	107.05	300.11	313.02	167.24	387.39	433.43

Movement, Approach, & Intersection Results

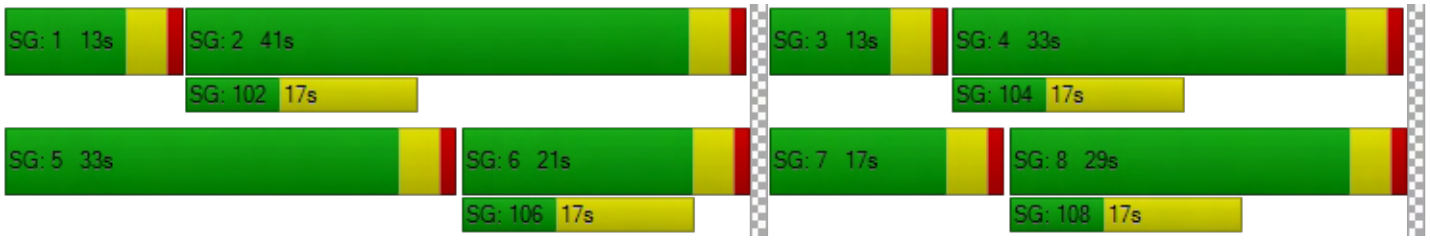
d_M, Delay for Movement [s/veh]	50.92	23.52	11.06	50.38	25.44	26.50	50.36	39.24	41.57	48.63	41.58	49.88
Movement LOS	D	C	B	D	C	C	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	25.14			29.52			41.17			43.54		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	35.04											
Intersection LOS	D											
Intersection V/C	0.643											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.048	3.037	3.050	3.074
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	740	340	500	580
d_b, Bicycle Delay [s]	19.85	34.45	28.13	25.21
l_b,int, Bicycle LOS Score for Intersection	2.343	2.187	2.192	2.423
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	287.3
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	3.064

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	20	16	5	11	3	0	3	8	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	598	45	46	580	45	70	82	42	65	141	94
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	150	11	12	145	11	18	21	11	16	35	24
Total Analysis Volume [veh/h]	50	598	45	46	580	45	70	82	42	65	141	94
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	25	0	0	25	0	0	75	0	0	75	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	21	21	71	71	71	71
g / C, Green / Cycle	0.21	0.21	0.21	0.21	0.71	0.71	0.71	0.71
(v / s)_i Volume / Saturation Flow Rate	0.06	0.34	0.06	0.33	2.42	0.03	1.77	0.06
s, saturation flow rate [veh/h]	813	1877	799	1876	63	1615	116	1615
c, Capacity [veh/h]	72	397	72	397	97	1144	130	1144
d1, Uniform Delay [s]	50.00	39.42	50.00	39.42	32.40	4.36	36.39	4.51
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	43.11	290.16	36.10	270.50	297.75	0.01	297.10	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.69	1.62	0.64	1.57	1.56	0.04	1.59	0.08
d, Delay for Lane Group [s/veh]	93.11	329.58	86.10	309.92	330.15	4.38	333.49	4.54
Lane Group LOS	F	F	F	F	F	A	F	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.11	41.59	1.87	39.41	8.98	0.23	12.60	0.53
50th-Percentile Queue Length [ft/ln]	52.69	1039.71	46.69	985.16	224.45	5.70	315.12	13.20
95th-Percentile Queue Length [veh/ln]	3.79	64.10	3.36	60.58	16.16	0.41	22.69	0.95
95th-Percentile Queue Length [ft/ln]	94.84	1602.61	84.04	1514.56	404.00	10.26	567.22	23.76

Movement, Approach, & Intersection Results

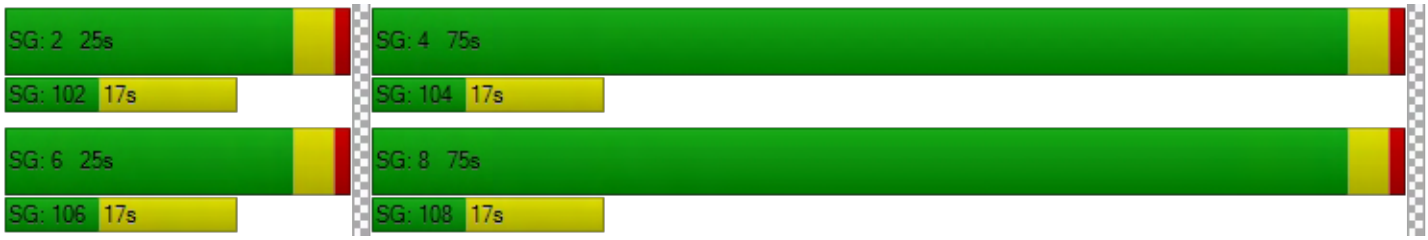
d_M, Delay for Movement [s/veh]	93.11	329.58	329.58	86.10	309.92	309.92	330.15	330.15	4.38	333.49	333.49	4.54
Movement LOS	F	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	312.52			294.58			259.62			230.42		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	287.26											
Intersection LOS	F											
Intersection V/C	3.064											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.565	2.585	2.156	2.164
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	420	420	1420	1420
d_b, Bicycle Delay [s]	31.21	31.21	4.21	4.21
l_b,int, Bicycle LOS Score for Intersection	2.703	2.667	1.880	2.055
Bicycle LOS	B	B	A	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	33.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.743

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	460	101	73	500	67	89	1451	74	135	1077	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	19	34	0	16	17	5	3	22	8	0	29	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	71	503	103	90	527	73	94	1502	83	138	1128	91
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	126	26	23	132	18	24	376	21	35	282	23
Total Analysis Volume [veh/h]	71	503	103	90	527	73	94	1502	83	138	1128	91
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	21	0	11	21	0	22	54	0	14	46	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	45	34	45	35	35	7	34	34	9	37	37
g / C, Green / Cycle	0.45	0.34	0.45	0.35	0.35	0.07	0.34	0.34	0.09	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.07	0.26	0.08	0.28	0.05	0.05	0.29	0.29	0.08	0.22	0.22
s, saturation flow rate [veh/h]	1058	1900	1082	1900	1615	1810	3618	1849	1810	3618	1828
c, Capacity [veh/h]	349	646	368	654	556	123	1233	630	170	1327	671
d1, Uniform Delay [s]	19.68	29.65	19.52	29.81	22.56	45.87	30.63	30.64	44.50	25.87	25.87
k, delay calibration	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.15	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.31	8.96	0.34	10.24	0.49	9.39	1.75	4.57	8.92	0.46	0.90
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.20	0.78	0.24	0.81	0.13	0.76	0.85	0.85	0.81	0.61	0.61
d, Delay for Lane Group [s/veh]	20.99	38.61	19.87	40.04	23.05	55.26	32.38	35.22	53.42	26.32	26.77
Lane Group LOS	C	D	B	D	C	E	C	D	D	C	C
Critical Lane Group	Yes	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.05	12.16	1.22	13.03	1.25	2.61	11.70	12.47	3.75	7.76	7.93
50th-Percentile Queue Length [ft/ln]	26.30	304.03	30.50	325.69	31.16	65.13	292.60	311.80	93.87	194.12	198.34
95th-Percentile Queue Length [veh/ln]	1.89	17.88	2.20	18.95	2.24	4.69	17.31	18.26	6.76	12.33	12.55
95th-Percentile Queue Length [ft/ln]	47.34	447.01	54.91	473.67	56.09	117.23	432.87	456.60	168.97	308.37	313.82

Movement, Approach, & Intersection Results

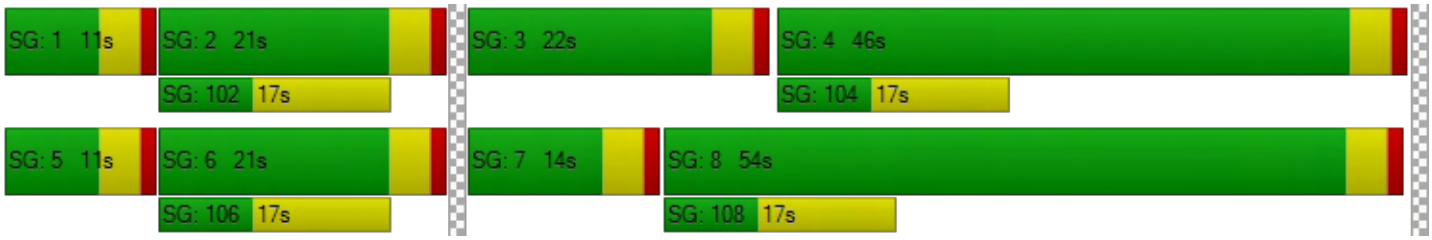
d_M, Delay for Movement [s/veh]	20.99	38.61	0.00	19.87	40.04	23.05	55.26	33.24	35.22	53.42	26.45	26.77
Movement LOS	C	D		B	D	C	E	C	D	D	C	C
d_A, Approach Delay [s/veh]	36.43			35.61			34.57			29.21		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	33.29											
Intersection LOS	C											
Intersection V/C	0.743											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.562	2.573	3.047	3.056
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	340	340	1000	840
d_b, Bicycle Delay [s]	34.45	34.45	12.50	16.82
l_b,int, Bicycle LOS Score for Intersection	2.507	2.698	2.483	2.306
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	98.5
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.594

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	31	563	33	27	592	43	36	107	30	42	103	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	20	16	5	11	3	0	3	8	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	597	37	48	620	49	48	112	31	46	113	83
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	149	9	12	155	12	12	28	8	12	28	21
Total Analysis Volume [veh/h]	32	597	37	48	620	49	48	112	31	46	113	83
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	34	0	0	34	0	0	66	0	0	66	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	31	31	31	31	61	61	61	61
g / C, Green / Cycle	0.31	0.31	0.31	0.31	0.61	0.61	0.61	0.61
(v / s)_i Volume / Saturation Flow Rate	0.04	0.34	0.06	0.36	1.08	0.02	1.02	0.05
s, saturation flow rate [veh/h]	780	1881	806	1876	148	1615	156	1615
c, Capacity [veh/h]	74	607	76	605	135	965	140	965
d1, Uniform Delay [s]	49.99	33.86	49.98	33.86	32.95	8.27	33.35	8.55
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	17.42	48.64	33.26	68.73	134.15	0.01	117.88	0.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.43	1.04	0.63	1.10	1.18	0.03	1.14	0.09
d, Delay for Lane Group [s/veh]	67.41	82.50	83.24	102.60	167.10	8.28	151.23	8.59
Lane Group LOS	E	F	F	F	F	A	F	A
Critical Lane Group	No	No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	1.15	22.73	1.90	26.05	7.05	0.26	6.70	0.71
50th-Percentile Queue Length [ft/ln]	28.85	568.15	47.51	651.15	176.37	6.43	167.44	17.82
95th-Percentile Queue Length [veh/ln]	2.08	31.43	3.42	36.69	12.64	0.46	11.87	1.28
95th-Percentile Queue Length [ft/ln]	51.93	785.85	85.52	917.17	315.98	11.58	296.64	32.07

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	67.41	82.50	82.50	83.24	102.60	102.60	167.10	167.10	8.28	151.23	151.23	8.59
Movement LOS	E	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	81.78			101.30			141.32			102.31		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	98.48											
Intersection LOS	F											
Intersection V/C	1.594											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.534	2.556	2.116	2.156
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	600	600	1240	1240
d_b, Bicycle Delay [s]	24.50	24.50	7.22	7.22
l_b,int, Bicycle LOS Score for Intersection	2.659	2.743	1.875	1.959
Bicycle LOS	B	B	A	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	32.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.662

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	1170	144	228	1250	109	155	916	128	93	656	368
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	43	5	0	28	0	0	2	4	2	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	108	1236	152	233	1303	111	158	936	135	97	670	375
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	309	38	58	326	28	40	234	34	24	168	94
Total Analysis Volume [veh/h]	108	1236	152	233	1303	111	158	936	135	97	670	375
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	17	24	0	14	21	0	15	21	0	41	47	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	43	43	10	46	46	11	24	24	7	20	20	20
g / C, Green / Cycle	0.08	0.43	0.43	0.10	0.46	0.46	0.10	0.24	0.24	0.07	0.20	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.06	0.26	0.26	0.09	0.26	0.26	0.09	0.20	0.20	0.05	0.15	0.15	0.15
s, saturation flow rate [veh/h]	1810	3618	1795	2663	3618	1825	1810	3618	1780	1810	3618	1745	1615
c, Capacity [veh/h]	139	1559	774	268	1646	830	191	861	424	128	735	354	328
d1, Uniform Delay [s]	45.41	21.80	21.80	44.38	20.08	20.09	43.90	36.27	36.28	45.70	37.38	37.41	37.43
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.10	1.68	3.35	8.44	1.44	2.84	8.81	2.20	4.38	8.85	1.45	3.02	3.29
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.78	0.59	0.59	0.87	0.57	0.57	0.83	0.83	0.83	0.76	0.74	0.74	0.74
d, Delay for Lane Group [s/veh]	54.51	23.48	25.16	52.82	21.53	22.93	52.71	38.47	40.67	54.55	38.83	40.42	40.72
Lane Group LOS	D	C	C	D	C	C	D	D	D	D	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.97	8.41	8.71	3.14	8.09	8.49	4.27	8.46	8.59	2.67	6.27	6.23	5.81
50th-Percentile Queue Length [ft/ln]	74.22	210.27	217.72	78.47	202.26	212.29	106.86	211.39	214.85	66.70	156.8	155.7	145.3
95th-Percentile Queue Length [veh/ln]	5.34	13.17	13.55	5.65	12.76	13.27	7.67	13.22	13.40	4.80	10.38	10.32	9.77
95th-Percentile Queue Length [ft/ln]	133.60	329.17	338.71	141.24	318.88	331.76	191.63	330.61	335.05	120.0	259.5	258.1	244.2

Movement, Approach, & Intersection Results

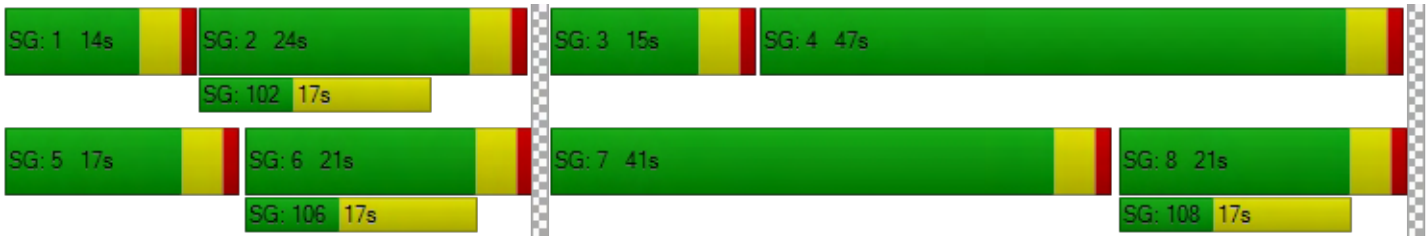
d_M, Delay for Movement [s/veh]	54.51	23.90	25.16	52.82	21.92	22.93	52.71	38.98	40.67	54.55	39.14	40.63
Movement LOS	D	C	C	D	C	C	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	26.24			26.36			40.93			40.93		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	32.59											
Intersection LOS	C											
Intersection V/C	0.662											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	0.00	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.100	0.000	2.894	3.030
Crosswalk LOS	C	F	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	400	340	340	860
d_b, Bicycle Delay [s]	32.00	34.45	34.45	16.25
l_b,int, Bicycle LOS Score for Intersection	2.382	2.465	2.236	2.188
Bicycle LOS	B	B	B	B

Sequence

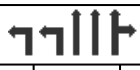
Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	38.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.801

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	166	835	219	303	980	183	211	1292	132	318	990	175
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	28	43	13	20	1	0	15	0	27	29	28
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	169	880	266	322	1020	188	215	1333	135	351	1039	207
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	220	67	81	255	47	54	333	34	88	260	52
Total Analysis Volume [veh/h]	169	880	266	322	1020	188	215	1333	135	351	1039	207
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	24	27	27	18	21	0	14	36	0	19	41	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	25	44	14	28	28	10	30	30	15	35	35
g / C, Green / Cycle	0.11	0.25	0.44	0.14	0.28	0.28	0.10	0.30	0.30	0.15	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.09	0.17	0.16	0.12	0.22	0.22	0.08	0.27	0.27	0.13	0.23	0.23
s, saturation flow rate [veh/h]	1810	5176	1615	2663	3618	1753	2663	3618	1812	2663	3618	1743
c, Capacity [veh/h]	205	1306	714	371	1007	488	266	1080	541	400	1261	608
d1, Uniform Delay [s]	43.40	33.72	18.64	42.18	33.65	33.66	44.14	33.77	33.79	41.66	27.68	27.68
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.34	0.11	0.11	0.19
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.97	2.79	1.49	6.20	6.98	13.48	5.80	3.22	16.04	6.31	0.61	2.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	0.67	0.37	0.87	0.81	0.81	0.81	0.91	0.91	0.88	0.67	0.67
d, Delay for Lane Group [s/veh]	51.37	36.51	20.13	48.38	40.64	47.14	49.94	36.99	49.83	47.97	28.29	29.85
Lane Group LOS	D	D	C	D	D	D	D	D	D	D	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.51	6.66	4.32	4.17	9.99	10.56	2.80	11.60	13.57	4.54	8.43	8.40
50th-Percentile Queue Length [ft/ln]	112.82	166.58	107.89	104.36	249.82	264.12	70.11	290.12	339.20	113.62	210.82	209.89
95th-Percentile Queue Length [veh/ln]	8.00	10.90	7.72	7.51	15.18	15.90	5.05	17.19	19.61	8.04	13.20	13.15
95th-Percentile Queue Length [ft/ln]	199.92	272.42	193.06	187.84	379.43	397.38	126.20	429.79	490.22	201.02	329.88	328.68

Movement, Approach, & Intersection Results

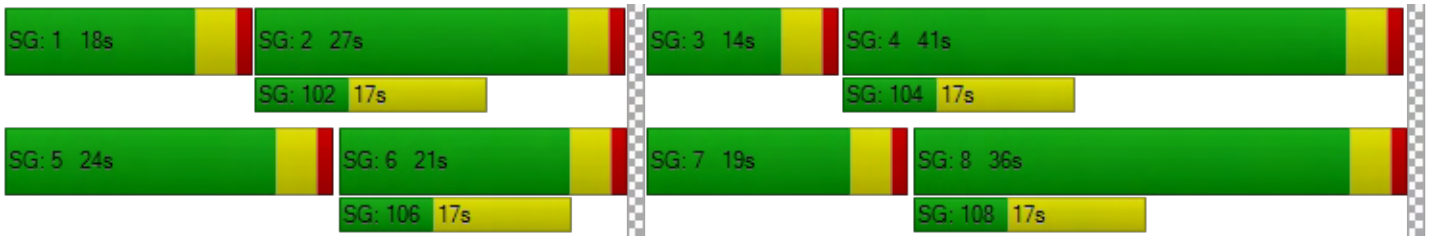
d_M, Delay for Movement [s/veh]	51.37	36.51	20.13	48.38	41.95	47.14	49.94	40.41	49.83	47.97	28.59	29.85
Movement LOS	D	D	C	D	D	D	D	D	D	D	C	C
d_A, Approach Delay [s/veh]	35.11			43.94			42.39			33.01		
Approach LOS	D			D			D			C		
d_I, Intersection Delay [s/veh]	38.77											
Intersection LOS	D											
Intersection V/C	0.801											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.074	3.075	3.106	3.159
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	460	340	640	740
d_b, Bicycle Delay [s]	29.65	34.45	23.12	19.85
l_b,int, Bicycle LOS Score for Intersection	2.283	2.401	2.485	2.438
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



General Plan Buildout (Year 2040) With Project

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	34.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.745

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	82	492	92	40	439	83	84	931	72	69	1128	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	12	0	8	36	2	4	30	21	0	16	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	105	612	112	57	572	103	106	1166	109	84	1392	89
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	153	28	14	143	26	27	292	27	21	348	22
Total Analysis Volume [veh/h]	105	612	112	57	572	103	106	1166	109	84	1392	89
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	23	0	12	21	0	26	21	0	44	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	49	39	49	38	38	8	33	33	6	32	32
g / C, Green / Cycle	0.49	0.39	0.49	0.38	0.38	0.08	0.33	0.33	0.06	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.10	0.32	0.06	0.30	0.06	0.06	0.23	0.23	0.05	0.27	0.27
s, saturation flow rate [veh/h]	1025	1900	979	1900	1615	1810	3618	1818	1810	3618	1842
c, Capacity [veh/h]	369	737	335	718	610	138	1198	602	116	1156	588
d1, Uniform Delay [s]	18.49	27.66	18.58	27.74	20.71	45.41	29.26	29.26	45.98	31.82	31.83
k, delay calibration	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.13
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.93	10.48	0.24	8.97	0.60	8.77	0.78	1.55	8.20	1.84	4.26
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.28	0.83	0.17	0.80	0.17	0.77	0.71	0.71	0.72	0.85	0.85
d, Delay for Lane Group [s/veh]	20.42	38.14	18.82	36.72	21.31	54.18	30.04	30.81	54.19	33.67	36.09
Lane Group LOS	C	D	B	D	C	D	C	C	D	C	D
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.47	14.87	0.69	13.56	1.68	2.90	8.84	9.02	2.30	11.10	11.70
50th-Percentile Queue Length [ft/ln]	36.76	371.68	17.35	338.96	42.09	72.60	221.03	225.40	57.58	277.43	292.48
95th-Percentile Queue Length [veh/ln]	2.65	21.19	1.25	19.60	3.03	5.23	13.72	13.94	4.15	16.56	17.31
95th-Percentile Queue Length [ft/ln]	66.17	529.77	31.23	489.92	75.76	130.67	342.95	348.51	103.65	414.02	432.71

Movement, Approach, & Intersection Results

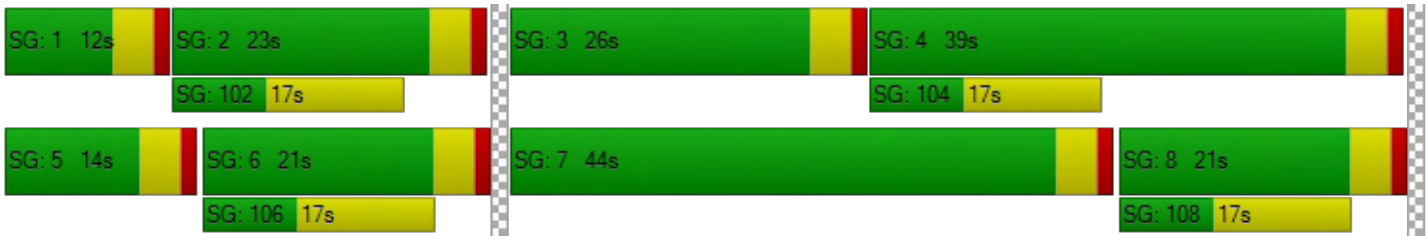
d_M, Delay for Movement [s/veh]	20.42	38.14	0.00	18.82	36.72	21.31	54.18	30.25	30.81	54.19	34.38	36.09
Movement LOS	C	D		B	D	C	D	C	C	D	C	D
d_A, Approach Delay [s/veh]	35.54			33.16			32.13			35.54		
Approach LOS	D			C			C			D		
d_I, Intersection Delay [s/veh]	34.07											
Intersection LOS	C											
Intersection V/C	0.745											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.594	2.605	3.074	3.020
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	380	340	340	700
d_b, Bicycle Delay [s]	32.81	34.45	34.45	21.13
l_b,int, Bicycle LOS Score for Intersection	2.743	2.767	2.319	2.420
Bicycle LOS	B	C	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	469.8
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	4.414

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	40	667	22	28	526	25	78	90	38	47	124	57
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	3	54	19	9	6	9	0	4	2	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	829	30	88	661	40	101	119	46	61	153	83
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	207	8	22	165	10	25	30	12	15	38	21
Total Analysis Volume [veh/h]	49	829	30	88	661	40	101	119	46	61	153	83
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	24	0	0	24	0	0	76	0	0	76	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	20	20	20	20	72	72	72	72
g / C, Green / Cycle	0.20	0.20	0.20	0.20	0.72	0.72	0.72	0.72
(v / s)_i Volume / Saturation Flow Rate	0.06	0.45	0.13	0.37	3.52	0.03	1.61	0.05
s, saturation flow rate [veh/h]	757	1888	653	1881	63	1615	133	1615
c, Capacity [veh/h]	72	380	72	378	97	1161	142	1161
d1, Uniform Delay [s]	50.00	39.95	50.00	39.95	32.99	4.06	37.46	4.16
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	41.28	576.62	177.40	394.25	596.84	0.01	262.09	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.68	2.26	1.22	1.85	2.26	0.04	1.51	0.07
d, Delay for Lane Group [s/veh]	91.28	616.57	227.40	434.20	629.82	4.08	299.55	4.19
Lane Group LOS	F	F	F	F	F	A	F	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.05	69.99	5.34	50.56	17.12	0.24	12.53	0.44
50th-Percentile Queue Length [ft/ln]	51.15	1749.66	133.53	1263.99	427.88	5.92	313.30	10.94
95th-Percentile Queue Length [veh/ln]	3.68	109.31	9.61	78.68	30.81	0.43	22.56	0.79
95th-Percentile Queue Length [ft/ln]	92.07	2732.63	240.35	1966.93	770.18	10.66	563.94	19.70

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	91.28	616.57	616.57	227.40	434.20	434.20	629.82	629.82	4.08	299.55	299.55	4.19
Movement LOS	F	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	588.22			411.13			521.61			217.00		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	469.77											
Intersection LOS	F											
Intersection V/C	4.414											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.631	2.719	2.180	2.244
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	400	400	1440	1440
d_b, Bicycle Delay [s]	32.00	32.00	3.92	3.92
l_b,int, Bicycle LOS Score for Intersection	3.058	2.861	1.999	2.050
Bicycle LOS	C	C	A	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	39.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.821

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	86	1069	170	281	1098	137	120	544	75	105	1052	358
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	21	1	0	46	0	0	1	8	5	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	107	1325	208	343	1386	167	146	665	100	133	1284	437
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	331	52	86	347	42	37	166	25	33	321	109
Total Analysis Volume [veh/h]	107	1325	208	343	1386	167	146	665	100	133	1284	437
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	33	36	0	18	21	0	14	21	0	25	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	33	33	14	40	40	10	28	28	9	27	27	27
g / C, Green / Cycle	0.08	0.33	0.33	0.14	0.40	0.40	0.10	0.28	0.28	0.09	0.27	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.06	0.28	0.28	0.13	0.29	0.29	0.08	0.14	0.14	0.07	0.24	0.24	0.24
s, saturation flow rate [veh/h]	1810	3618	1771	2663	3618	1798	1810	3618	1776	1810	3618	1869	1615
c, Capacity [veh/h]	138	1203	589	373	1434	712	177	996	489	167	975	504	435
d1, Uniform Delay [s]	45.36	31.15	31.17	42.46	25.55	25.60	44.28	30.61	30.66	44.51	35.22	35.23	35.34
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.31	0.32
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.84	7.89	14.81	9.35	3.19	6.37	9.16	0.41	0.85	8.41	3.25	14.75	17.83
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.77	0.86	0.86	0.92	0.72	0.73	0.82	0.51	0.52	0.80	0.90	0.90	0.91
d, Delay for Lane Group [s/veh]	54.20	39.04	45.97	51.81	28.74	31.97	53.44	31.02	31.51	52.92	38.47	49.98	53.17
Lane Group LOS	D	D	D	D	C	C	D	C	C	D	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.93	12.59	13.48	4.62	10.73	11.36	3.97	5.19	5.21	3.60	10.46	12.44	11.24
50th-Percentile Queue Length [ft/ln]	73.28	314.77	336.90	115.52	268.15	283.92	99.37	129.72	130.25	89.95	261.6	310.9	280.9
95th-Percentile Queue Length [veh/ln]	5.28	18.41	19.50	8.15	16.10	16.88	7.15	8.92	8.95	6.48	15.77	18.22	16.73
95th-Percentile Queue Length [ft/ln]	131.90	460.25	487.41	203.66	402.43	422.09	178.87	223.11	223.84	161.9	394.2	455.5	418.3

Movement, Approach, & Intersection Results

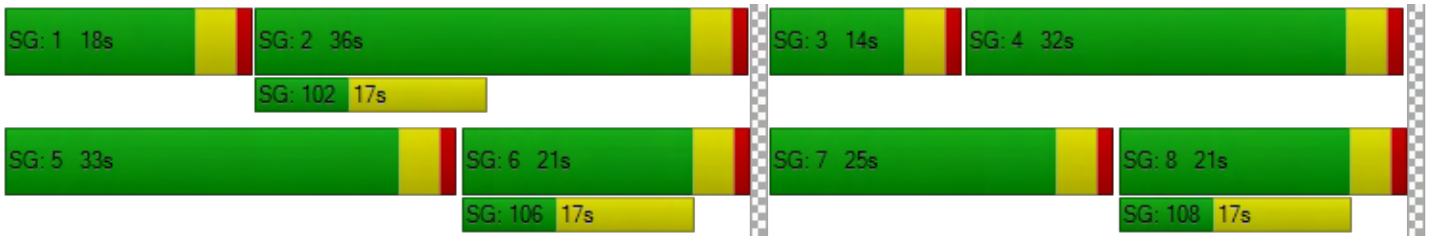
d_M, Delay for Movement [s/veh]	54.20	40.59	45.97	51.81	29.56	31.97	53.44	31.14	31.51	52.92	42.14	53.12
Movement LOS	D	D	D	D	C	C	D	C	C	D	D	D
d_A, Approach Delay [s/veh]	42.16			33.79			34.75			45.44		
Approach LOS	D			C			C			D		
d_I, Intersection Delay [s/veh]	39.54											
Intersection LOS	D											
Intersection V/C	0.821											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	0.00	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.127	0.000	2.943	3.104
Crosswalk LOS	C	F	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	640	340	340	560
d_b, Bicycle Delay [s]	23.12	34.45	34.45	25.92
l_b,int, Bicycle LOS Score for Intersection	2.462	2.602	2.061	2.579
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	38.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.767

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	167	1031	161	149	765	147	177	836	85	231	1124	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	24	28	31	0	1	28	0	51	10	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	204	1273	220	210	964	179	217	1048	104	333	1381	150
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	318	55	53	241	45	54	262	26	83	345	38
Total Analysis Volume [veh/h]	204	1273	220	210	964	179	217	1048	104	333	1381	150
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	28	35	35	14	21	0	14	33	0	18	37	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	13	33	51	10	30	30	10	27	27	14	31	31
g / C, Green / Cycle	0.13	0.33	0.51	0.10	0.30	0.30	0.10	0.27	0.27	0.14	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.11	0.25	0.14	0.08	0.21	0.21	0.08	0.21	0.21	0.13	0.28	0.28
s, saturation flow rate [veh/h]	1810	5176	1615	2663	3618	1752	2663	3618	1813	2663	3618	1806
c, Capacity [veh/h]	242	1717	827	261	1071	519	268	976	489	374	1121	560
d1, Uniform Delay [s]	42.33	29.65	13.79	44.22	31.53	31.53	44.11	33.88	33.88	42.28	33.21	33.26
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.24	0.11	0.11	0.35
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.71	2.93	0.79	5.73	4.17	8.35	5.84	1.44	6.01	7.35	3.24	16.74
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.84	0.74	0.27	0.80	0.72	0.72	0.81	0.79	0.79	0.89	0.91	0.91
d, Delay for Lane Group [s/veh]	50.04	32.57	14.58	49.95	35.69	39.88	49.95	35.32	39.89	49.63	36.45	50.00
Lane Group LOS	D	C	B	D	D	D	D	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	5.39	9.30	2.90	2.74	8.78	9.11	2.83	8.66	9.31	4.38	12.06	14.21
50th-Percentile Queue Length [ft/ln]	134.85	232.44	72.56	68.46	219.57	227.80	70.78	216.58	232.74	109.52	301.52	355.15
95th-Percentile Queue Length [veh/ln]	9.20	14.30	5.22	4.93	13.64	14.06	5.10	13.49	14.31	7.81	17.76	20.39
95th-Percentile Queue Length [ft/ln]	230.08	357.46	130.60	123.23	341.08	351.56	127.41	337.26	357.83	195.34	443.91	509.69

Movement, Approach, & Intersection Results

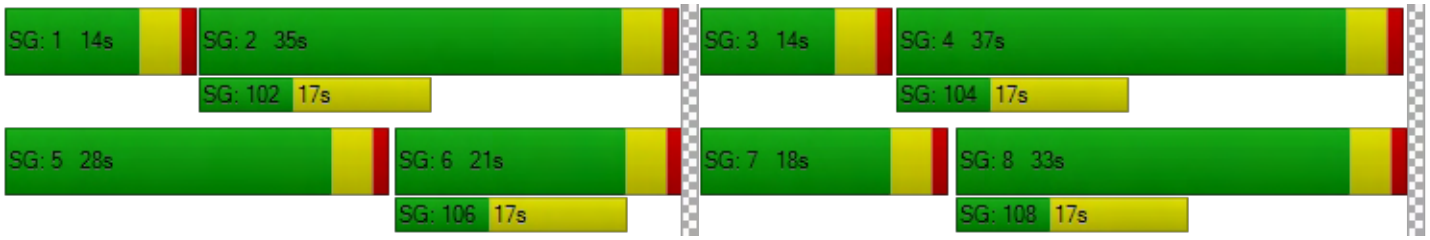
d_M, Delay for Movement [s/veh]	50.04	32.57	14.58	49.95	36.53	39.88	49.95	36.54	39.89	49.63	40.00	50.00
Movement LOS	D	C	B	D	D	D	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	32.34			39.06			38.92			42.52		
Approach LOS	C			D			D			D		
d_I, Intersection Delay [s/veh]	38.24											
Intersection LOS	D											
Intersection V/C	0.767											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.108	3.095	3.112	3.138
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	620	340	580	660
d_b, Bicycle Delay [s]	23.81	34.45	25.21	22.45
l_b,int, Bicycle LOS Score for Intersection	2.493	2.304	2.313	2.585
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	377.9
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	3.533

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	20	16	5	11	3	0	3	8	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	711	53	51	691	53	82	97	50	77	167	103
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	178	13	13	173	13	21	24	13	19	42	26
Total Analysis Volume [veh/h]	60	711	53	51	691	53	82	97	50	77	167	103
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	26	0	0	26	0	0	74	0	0	74	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	22	22	70	70	70	70
g / C, Green / Cycle	0.22	0.22	0.22	0.22	0.70	0.70	0.70	0.70
(v / s)_i Volume / Saturation Flow Rate	0.08	0.41	0.07	0.40	2.77	0.03	2.06	0.06
s, saturation flow rate [veh/h]	728	1877	714	1876	65	1615	118	1615
c, Capacity [veh/h]	72	416	72	416	98	1128	130	1128
d1, Uniform Delay [s]	50.00	38.93	50.00	38.93	31.92	4.69	36.01	4.85
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	66.23	386.33	45.11	365.22	412.34	0.02	422.74	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.83	1.84	0.71	1.79	1.83	0.04	1.88	0.09
d, Delay for Lane Group [s/veh]	116.23	425.25	95.11	404.15	444.26	4.71	458.75	4.89
Lane Group LOS	F	F	F	F	F	A	F	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.82	54.63	2.17	52.17	12.13	0.29	17.15	0.61
50th-Percentile Queue Length [ft/ln]	70.47	1365.67	54.31	1304.33	303.29	7.18	428.67	15.31
95th-Percentile Queue Length [veh/ln]	5.07	84.97	3.91	81.02	21.84	0.52	30.86	1.10
95th-Percentile Queue Length [ft/ln]	126.85	2124.26	97.75	2025.57	545.93	12.92	771.60	27.57

Movement, Approach, & Intersection Results

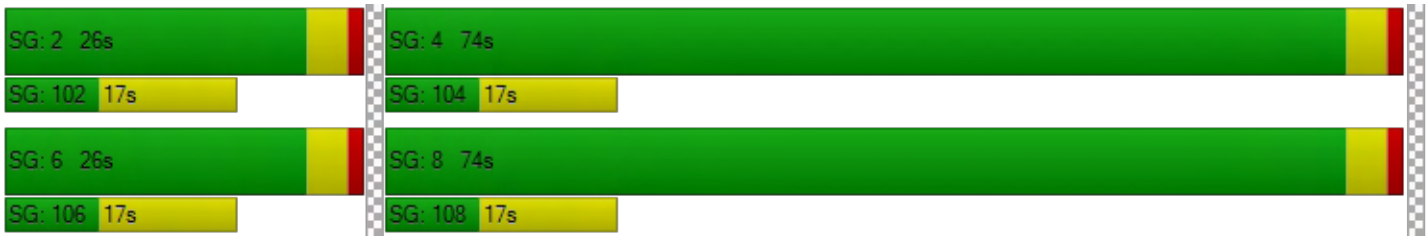
d_M, Delay for Movement [s/veh]	116.23	425.25	425.25	95.11	404.15	404.15	444.26	444.26	4.71	458.75	458.75	4.89
Movement LOS	F	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	402.75			384.32			348.29			324.03		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	377.95											
Intersection LOS	F											
Intersection V/C	3.533											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.646	2.665	2.196	2.196
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	440	440	1400	1400
d_b, Bicycle Delay [s]	30.42	30.42	4.50	4.50
l_b,int, Bicycle LOS Score for Intersection	2.919	2.871	1.937	2.132
Bicycle LOS	C	C	A	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	46.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.885

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	460	101	73	500	67	89	1451	74	135	1077	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	19	34	0	16	17	5	3	22	8	0	29	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	81	595	123	105	627	87	112	1792	98	165	1343	107
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	149	31	26	157	22	28	448	25	41	336	27
Total Analysis Volume [veh/h]	81	595	123	105	627	87	112	1792	98	165	1343	107
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	26	36	0	11	21	0	12	39	0	14	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	43	32	43	33	33	8	35	35	10	37	37
g / C, Green / Cycle	0.43	0.32	0.43	0.33	0.33	0.08	0.35	0.35	0.10	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.08	0.31	0.10	0.33	0.05	0.06	0.35	0.35	0.09	0.27	0.27
s, saturation flow rate [veh/h]	1003	1900	1030	1900	1615	1810	3618	1850	1810	3618	1829
c, Capacity [veh/h]	277	618	299	624	531	140	1261	645	181	1343	679
d1, Uniform Delay [s]	22.74	33.17	22.42	33.57	23.82	45.37	32.42	32.48	44.56	26.95	26.95
k, delay calibration	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.45	0.11	0.11	0.25
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.67	28.24	0.70	37.02	0.66	9.97	9.79	32.26	15.78	0.73	3.26
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.29	0.96	0.35	1.00	0.16	0.80	0.99	0.99	0.91	0.72	0.72
d, Delay for Lane Group [s/veh]	25.41	61.40	23.12	70.59	24.49	55.34	42.21	64.74	60.35	27.68	30.21
Lane Group LOS	C	E	C	F	C	E	D	E	E	C	C
Critical Lane Group	Yes	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.30	18.60	1.50	21.10	1.55	3.10	16.21	20.68	4.81	9.69	10.28
50th-Percentile Queue Length [ft/ln]	32.54	465.07	37.49	527.53	38.73	77.59	405.16	517.11	120.24	242.30	257.06
95th-Percentile Queue Length [veh/ln]	2.34	25.68	2.70	28.71	2.79	5.59	22.81	28.14	8.41	14.80	15.54
95th-Percentile Queue Length [ft/ln]	58.58	641.90	67.47	717.87	69.71	139.67	570.22	703.58	210.15	369.94	388.54

Movement, Approach, & Intersection Results

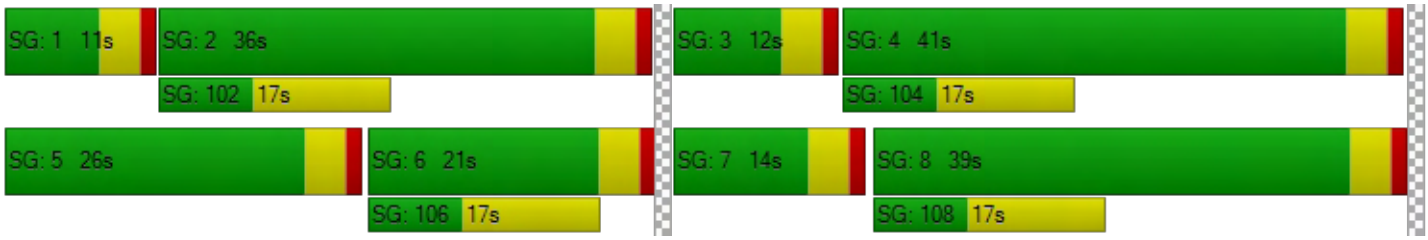
d_M, Delay for Movement [s/veh]	25.41	61.40	0.00	23.12	70.59	24.49	55.34	49.04	64.74	60.35	28.39	30.21
Movement LOS	C	E		C	F	C	E	D	E	E	C	C
d_A, Approach Delay [s/veh]	57.09			59.61			50.16			31.78		
Approach LOS	E			E			D			C		
d_I, Intersection Delay [s/veh]	46.78											
Intersection LOS	D											
Intersection V/C	0.885											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.610	2.623	3.128	3.139
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	640	340	700	740
d_b, Bicycle Delay [s]	23.12	34.45	21.13	19.85
l_b,int, Bicycle LOS Score for Intersection	2.675	2.911	2.661	2.448
Bicycle LOS	B	C	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	182.9
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.850

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	31	563	33	27	592	43	36	107	30	42	103	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	20	16	5	11	3	0	3	8	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	710	43	53	738	57	55	134	37	54	134	89
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	178	11	13	185	14	14	34	9	14	34	22
Total Analysis Volume [veh/h]	38	710	43	53	738	57	55	134	37	54	134	89
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	35	0	0	35	0	0	65	0	0	65	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	31	31	31	31	61	61	61	61
g / C, Green / Cycle	0.31	0.31	0.31	0.31	0.61	0.61	0.61	0.61
(v / s)_i Volume / Saturation Flow Rate	0.05	0.40	0.07	0.42	1.24	0.02	1.21	0.06
s, saturation flow rate [veh/h]	694	1881	721	1876	152	1615	155	1615
c, Capacity [veh/h]	72	587	72	585	139	982	141	982
d1, Uniform Delay [s]	50.00	34.41	50.00	34.41	33.65	7.86	33.79	8.12
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	24.98	140.33	49.19	172.39	201.01	0.02	191.72	0.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.53	1.28	0.74	1.36	1.36	0.04	1.34	0.09
d, Delay for Lane Group [s/veh]	74.98	174.74	99.19	206.80	234.67	7.87	225.51	8.16
Lane Group LOS	E	F	F	F	F	A	F	A
Critical Lane Group	No	No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	1.45	36.72	2.30	41.84	9.90	0.31	9.67	0.76
50th-Percentile Queue Length [ft/ln]	36.14	918.02	57.59	1045.94	247.50	7.66	241.69	19.05
95th-Percentile Queue Length [veh/ln]	2.60	53.97	4.15	62.29	17.82	0.55	17.40	1.37
95th-Percentile Queue Length [ft/ln]	65.06	1349.17	103.67	1557.26	445.50	13.78	435.04	34.28

Movement, Approach, & Intersection Results

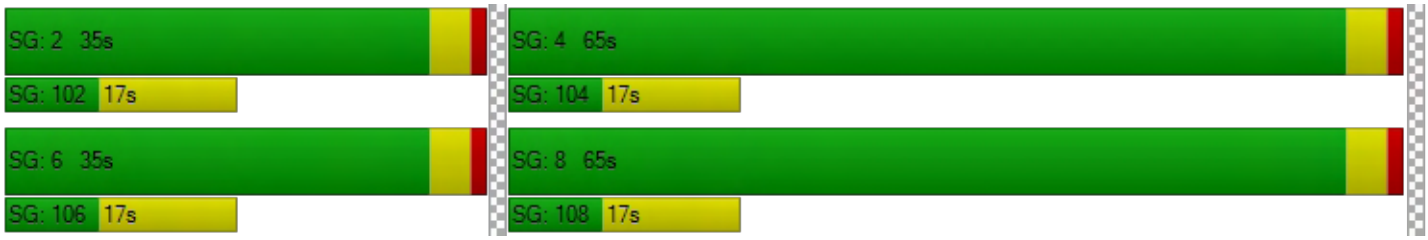
d_M, Delay for Movement [s/veh]	74.98	174.74	174.74	99.19	206.80	206.80	234.67	234.67	7.87	225.51	225.51	8.16
Movement LOS	E	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	169.95			200.07			197.54			155.68		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	182.94											
Intersection LOS	F											
Intersection V/C	1.850											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.608	2.629	2.147	2.185
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	620	620	1220	1220
d_b, Bicycle Delay [s]	23.81	23.81	7.61	7.61
l_b,int, Bicycle LOS Score for Intersection	2.865	2.959	1.933	2.017
Bicycle LOS	C	C	A	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	27.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.755

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	73	495	277	80	499	97	84	1383	105	183	879	79
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	2	0	6	13	18	22	0	7	50	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	612	340	98	615	131	120	1709	128	230	1122	96
Peak Hour Factor	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	157	87	25	158	34	31	438	33	59	287	25
Total Analysis Volume [veh/h]	91	627	348	100	630	134	123	1751	131	236	1150	98
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	13	41	0	18	46	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	27	45	27	27	27	8	37	37	14	43	43
g / C, Green / Cycle	0.30	0.30	0.50	0.30	0.30	0.30	0.09	0.41	0.41	0.16	0.48	0.48
(v / s)_i Volume / Saturation Flow Rate	0.11	0.17	0.22	0.12	0.17	0.08	0.07	0.34	0.35	0.13	0.23	0.23
s, saturation flow rate [veh/h]	809	3618	1615	811	3618	1615	1810	3618	1833	1810	3618	1825
c, Capacity [veh/h]	185	1085	806	186	1085	484	157	1490	755	280	1737	876
d1, Uniform Delay [s]	38.42	26.70	14.39	38.82	26.73	24.07	40.32	23.78	23.84	36.99	15.79	15.79
k, delay calibration	0.11	0.11	0.19	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.02	0.49	0.65	2.40	0.49	0.31	8.31	5.75	10.93	6.73	0.94	1.86
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.49	0.58	0.43	0.54	0.58	0.28	0.78	0.84	0.84	0.84	0.48	0.48
d, Delay for Lane Group [s/veh]	40.43	27.19	15.04	41.22	27.23	24.38	48.62	29.52	34.77	43.73	16.74	17.66
Lane Group LOS	D	C	B	D	C	C	D	C	C	D	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.02	5.53	4.32	2.28	5.65	2.18	2.97	12.23	13.57	5.42	5.54	5.81
50th-Percentile Queue Length [ft/ln]	50.40	138.36	107.96	56.88	141.33	54.46	74.22	305.79	339.25	135.39	138.54	145.35
95th-Percentile Queue Length [veh/ln]	3.63	9.39	7.73	4.10	9.55	3.92	5.34	17.97	19.61	9.23	9.40	9.77
95th-Percentile Queue Length [ft/ln]	90.73	234.81	193.16	102.38	238.81	98.03	133.60	449.19	490.28	230.81	235.05	244.21

Movement, Approach, & Intersection Results

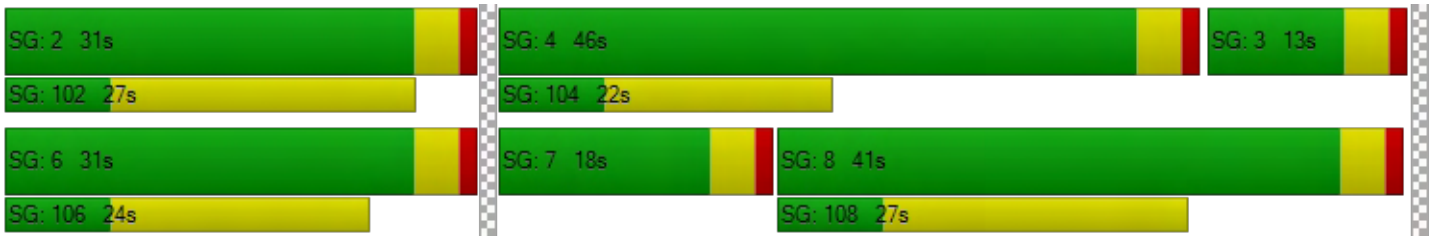
d_M, Delay for Movement [s/veh]	40.43	27.19	15.04	41.22	27.23	24.38	48.62	31.03	34.77	43.73	16.99	17.66
Movement LOS	D	C	B	D	C	C	D	C	C	D	B	B
d_A, Approach Delay [s/veh]	24.36			28.40			32.36			21.29		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	27.12											
Intersection LOS	C											
Intersection V/C	0.755											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.843	2.731	3.272	3.334
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	600	600	822	933
d_b, Bicycle Delay [s]	22.05	22.05	15.61	12.80
l_b,int, Bicycle LOS Score for Intersection	2.439	2.272	2.662	2.376
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	15.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.754

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	25	106	29	51	134	84	107	1682	54	58	1030	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	27	4	40	14	10	0	0	17	11
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	135	35	89	167	142	145	2062	66	71	1274	85
Peak Hour Factor	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	35	9	23	44	37	38	541	17	19	335	22
Total Analysis Volume [veh/h]	33	142	37	93	175	149	152	2166	69	75	1338	89
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	44.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	34	0	0	34	0	0	56	0	0	56	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	25	25	57	57	57	57	57	57
g / C, Green / Cycle	0.28	0.28	0.64	0.64	0.64	0.64	0.64	0.64
(v / s)_i Volume / Saturation Flow Rate	0.13	0.26	0.40	0.41	0.41	0.43	0.26	0.26
s, saturation flow rate [veh/h]	1616	1635	381	3618	1870	174	3618	1840
c, Capacity [veh/h]	491	499	265	2300	1189	143	2300	1170
d1, Uniform Delay [s]	26.69	31.50	19.83	10.04	10.08	31.23	8.07	8.07
k, delay calibration	0.11	0.28	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.60	9.10	8.74	1.37	2.68	13.06	0.55	1.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.43	0.84	0.57	0.64	0.64	0.52	0.41	0.41
d, Delay for Lane Group [s/veh]	27.29	40.60	28.57	11.41	12.77	44.29	8.62	9.14
Lane Group LOS	C	D	C	B	B	D	A	A
Critical Lane Group	No	Yes	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.73	9.76	3.17	8.14	8.94	2.18	4.16	4.40
50th-Percentile Queue Length [ft/ln]	93.21	244.04	79.20	203.55	223.42	54.42	103.95	110.00
95th-Percentile Queue Length [veh/ln]	6.71	14.89	5.70	12.82	13.84	3.92	7.48	7.84
95th-Percentile Queue Length [ft/ln]	167.77	372.14	142.57	320.54	345.98	97.96	187.11	196.01

Movement, Approach, & Intersection Results

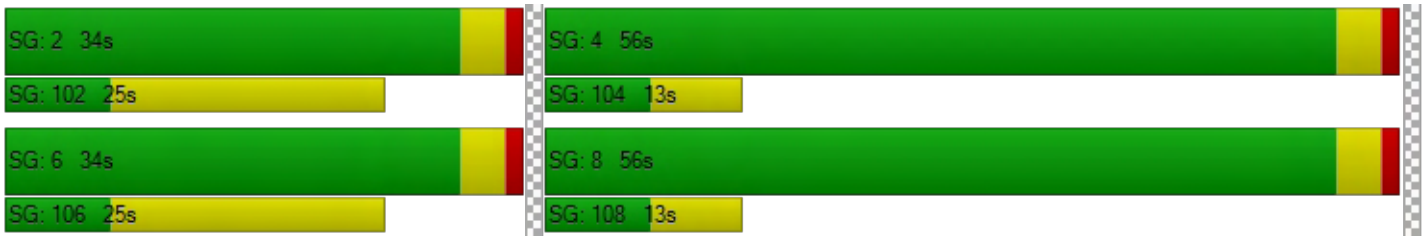
d_M, Delay for Movement [s/veh]	27.29	27.29	27.29	40.60	40.60	40.60	28.57	11.85	12.77	44.29	8.77	9.14
Movement LOS	C	C	C	D	D	D	C	B	B	D	A	A
d_A, Approach Delay [s/veh]	27.29			40.60			12.94			10.57		
Approach LOS	C			D			B			B		
d_I, Intersection Delay [s/veh]	15.38											
Intersection LOS	B											
Intersection V/C	0.754											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.080	2.416	3.185	3.255
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	667	667	1156	1156
d_b, Bicycle Delay [s]	20.00	20.00	8.02	8.02
l_b,int, Bicycle LOS Score for Intersection	1.909	2.248	2.872	2.386
Bicycle LOS	A	B	C	B

Sequence

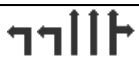
Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	38.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.789

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	1170	144	228	1250	109	155	916	128	93	656	368
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	43	5	0	28	0	0	2	4	2	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	128	1470	181	278	1553	133	189	1120	160	115	801	449
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	368	45	70	388	33	47	280	40	29	200	112
Total Analysis Volume [veh/h]	128	1470	181	278	1553	133	189	1120	160	115	801	449
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	19	24	0	16	21	0	16	21	0	39	44	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	36	36	12	39	39	12	28	28	8	24	24	24
g / C, Green / Cycle	0.09	0.36	0.36	0.12	0.39	0.39	0.12	0.28	0.28	0.08	0.24	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.07	0.30	0.31	0.10	0.31	0.31	0.10	0.24	0.24	0.06	0.18	0.18	0.18
s, saturation flow rate [veh/h]	1810	3618	1795	2663	3618	1824	1810	3618	1781	1810	3618	1743	1615
c, Capacity [veh/h]	161	1293	642	321	1407	710	218	1013	499	149	874	421	390
d1, Uniform Delay [s]	44.72	29.73	29.77	43.24	27.06	27.12	43.24	34.02	34.02	45.04	35.08	35.08	35.08
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.12	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.57	7.25	13.65	7.01	4.72	9.15	9.93	2.06	4.62	8.26	1.26	2.59	2.79
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.79	0.85	0.85	0.87	0.80	0.80	0.87	0.85	0.85	0.77	0.74	0.74	0.74
d, Delay for Lane Group [s/veh]	53.28	36.98	43.42	50.25	31.78	36.27	53.18	36.08	38.64	53.30	36.34	37.67	37.88
Lane Group LOS	D	D	D	D	C	D	D	D	D	D	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	3.48	13.15	14.24	3.66	12.32	13.38	5.15	9.92	10.13	3.12	7.34	7.23	6.73
50th-Percentile Queue Length [ft/ln]	86.90	328.85	356.07	91.51	307.93	334.41	128.85	248.10	253.14	78.04	183.5	180.8	168.1
95th-Percentile Queue Length [veh/ln]	6.26	19.10	20.43	6.59	18.07	19.37	8.88	15.09	15.34	5.62	11.79	11.64	10.98
95th-Percentile Queue Length [ft/ln]	156.41	477.55	510.80	164.72	451.82	484.37	221.93	377.26	383.61	140.4	294.6	291.1	274.5

Movement, Approach, & Intersection Results

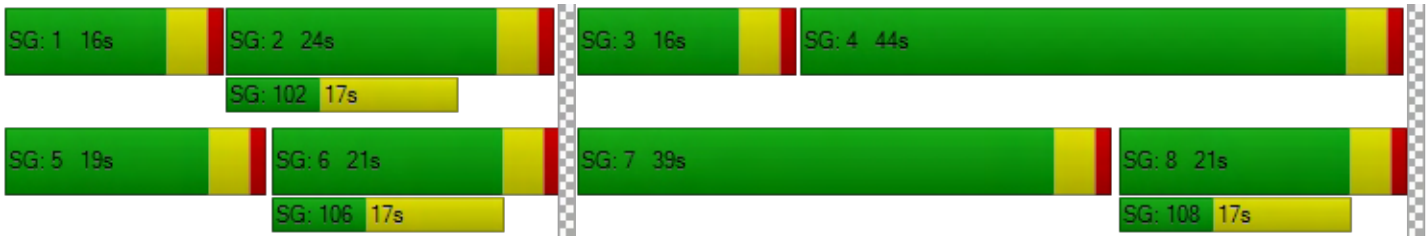
d_M, Delay for Movement [s/veh]	53.28	38.59	43.42	50.25	33.04	36.27	53.18	36.68	38.64	53.30	36.59	37.81
Movement LOS	D	D	D	D	C	D	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	40.14			35.69			39.01			38.40		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	38.20											
Intersection LOS	D											
Intersection V/C	0.789											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	0.00	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.170	0.000	2.951	3.089
Crosswalk LOS	C	F	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	400	340	340	800
d_b, Bicycle Delay [s]	32.00	34.45	34.45	18.00
l_b,int, Bicycle LOS Score for Intersection	2.538	2.640	2.368	2.310
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	54.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.957

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	166	835	219	303	980	183	211	1292	132	318	990	175
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	28	43	13	20	1	0	15	0	27	29	28
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	203	1047	310	383	1216	224	257	1591	161	415	1237	242
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	262	78	96	304	56	64	398	40	104	309	61
Total Analysis Volume [veh/h]	203	1047	310	383	1216	224	257	1591	161	415	1237	242
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	26	26	19	30	0	15	36	0	19	40	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	22	41	15	26	26	11	32	32	15	36	36
g / C, Green / Cycle	0.11	0.22	0.41	0.15	0.26	0.26	0.11	0.32	0.32	0.15	0.36	0.36
(v / s)_i Volume / Saturation Flow Rate	0.11	0.20	0.19	0.14	0.27	0.27	0.10	0.32	0.32	0.16	0.28	0.28
s, saturation flow rate [veh/h]	1810	5176	1615	2663	3618	1753	2663	3618	1812	2663	3618	1746
c, Capacity [veh/h]	199	1147	665	400	947	459	293	1151	577	400	1296	625
d1, Uniform Delay [s]	44.51	37.98	21.42	42.20	36.93	36.93	43.84	34.10	34.10	42.51	28.43	28.51
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.46	0.11	0.11	0.29
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	34.35	12.43	2.34	13.12	35.26	49.40	8.17	15.35	40.85	31.57	0.99	5.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.02	0.91	0.47	0.96	1.02	1.03	0.88	1.01	1.02	1.04	0.77	0.77
d, Delay for Lane Group [s/veh]	78.86	50.42	23.76	55.32	72.19	86.33	52.01	49.46	74.95	74.08	29.41	33.90
Lane Group LOS	F	D	C	E	F	F	D	F	F	F	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	6.79	9.53	5.60	5.36	15.95	17.26	3.44	15.99	20.10	6.63	10.42	10.92
50th-Percentile Queue Length [ft/ln]	169.85	238.22	140.11	134.12	398.71	431.46	85.98	399.75	502.62	165.69	260.56	273.12
95th-Percentile Queue Length [veh/ln]	11.15	14.59	9.49	9.16	22.81	24.48	6.19	22.72	27.80	11.03	15.72	16.35
95th-Percentile Queue Length [ft/ln]	278.73	364.79	237.17	229.09	570.27	612.01	154.77	568.04	694.92	275.64	392.93	408.64

Movement, Approach, & Intersection Results

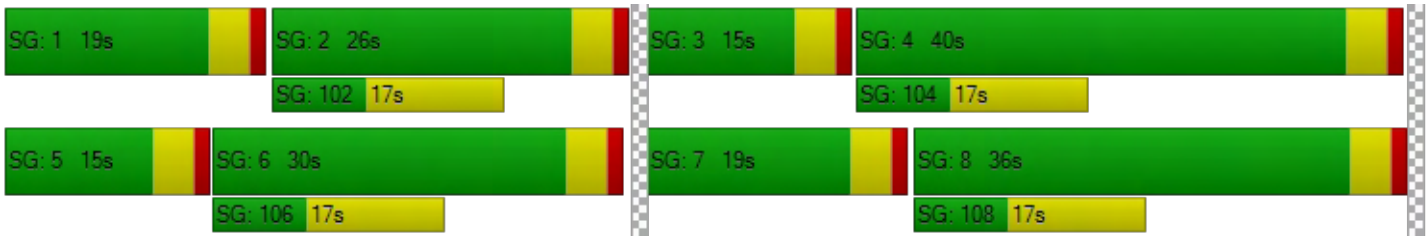
d_M, Delay for Movement [s/veh]	78.86	50.42	23.76	55.32	75.07	86.33	52.01	56.29	74.95	74.08	30.29	33.90
Movement LOS	F	D	C	E	E	F	D	E	E	F	C	C
d_A, Approach Delay [s/veh]	48.82			72.30			57.24			40.35		
Approach LOS	D			E			E			D		
d_I, Intersection Delay [s/veh]	54.81											
Intersection LOS	D											
Intersection V/C	0.957											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.139	3.141	3.178	3.239
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	440	520	640	720
d_b, Bicycle Delay [s]	30.42	27.38	23.12	20.48
l_b,int, Bicycle LOS Score for Intersection	2.418	2.562	2.665	2.601
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 20: Cherry Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	30.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.794

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	118.00	135.00	100.00	100.00	180.00	100.00	100.00	186.00	100.00	100.00
Speed [mph]	30.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	78	419	41	185	588	235	195	1413	78	72	891	170
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	5	0	8	3	0	0	30	7	0	26	14
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	97	516	50	234	720	287	238	1754	102	88	1113	221
Peak Hour Factor	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	132	13	60	184	74	61	449	26	23	285	57
Total Analysis Volume [veh/h]	99	529	51	240	738	294	244	1797	105	90	1140	226
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	86.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	29	0	11	29	0	18	39	0	11	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	0	0	0	12	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	32	21	21	32	22	22	14	40	40	6	32	32
g / C, Green / Cycle	0.36	0.23	0.23	0.36	0.24	0.24	0.16	0.44	0.44	0.07	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.10	0.15	0.16	0.21	0.20	0.18	0.13	0.35	0.35	0.05	0.25	0.25
s, saturation flow rate [veh/h]	1018	1900	1842	1120	3618	1615	1810	3618	1847	1810	3618	1743
c, Capacity [veh/h]	335	442	429	392	865	386	284	1593	813	128	1282	618
d1, Uniform Delay [s]	21.91	31.39	31.41	22.96	32.79	31.91	37.06	21.64	21.71	40.98	25.23	25.23
k, delay calibration	0.11	0.11	0.11	0.19	0.11	0.12	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.49	1.72	1.79	2.70	2.51	3.40	7.52	4.05	7.85	6.86	3.50	7.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.30	0.66	0.67	0.61	0.85	0.76	0.86	0.79	0.79	0.70	0.72	0.72
d, Delay for Lane Group [s/veh]	22.39	33.12	33.20	25.66	35.30	35.31	44.58	25.68	29.55	47.83	28.73	32.29
Lane Group LOS	C	C	C	C	D	D	D	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.43	5.88	5.73	3.95	7.78	6.17	5.67	11.38	12.58	2.15	8.69	8.99
50th-Percentile Queue Length [ft/ln]	35.77	147.05	143.22	98.86	194.55	154.13	141.75	284.46	314.49	53.82	217.31	224.77
95th-Percentile Queue Length [veh/ln]	2.58	9.86	9.65	7.12	12.36	10.24	9.57	16.91	18.40	3.88	13.53	13.91
95th-Percentile Queue Length [ft/ln]	64.38	246.49	241.36	177.94	308.93	255.93	239.37	422.76	459.90	96.88	338.20	347.71

Movement, Approach, & Intersection Results

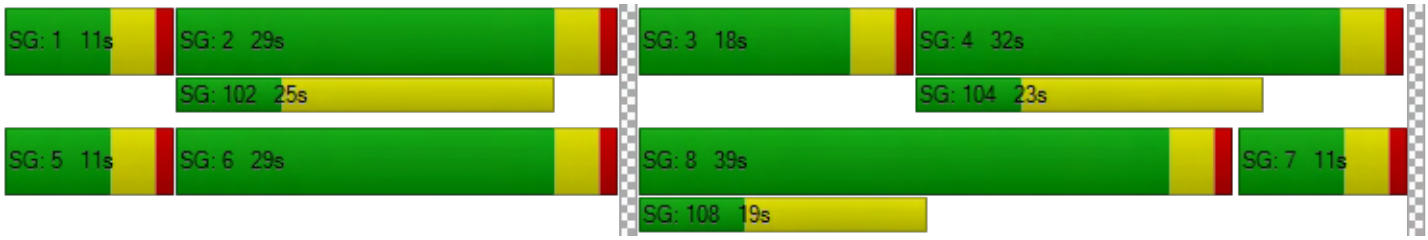
d_M, Delay for Movement [s/veh]	22.39	33.15	33.20	25.66	35.30	35.31	44.58	26.85	29.55	47.83	29.41	32.29
Movement LOS	C	C	C	C	D	D	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	31.59			33.49			28.99			31.00		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	30.87											
Intersection LOS	C											
Intersection V/C	0.794											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.614	2.821	0.000	3.257
Crosswalk LOS	B	C	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	556	556	778	622
d_b, Bicycle Delay [s]	23.47	23.47	16.81	21.36
l_b,int, Bicycle LOS Score for Intersection	2.120	2.609	2.740	2.360
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



July 5, 2019

Mr. Jesus Saldana, Senior Engineering Technician
CITY OF SIGNAL HILL
2175 Cherry Avenue
Signal Hill, CA 90755

RE: Signal Hill Business Center Signal Warrant Analysis
18-0056

Mr. Jesus Saldana:

INTRODUCTION

Ganddini Group, Inc. is pleased to submit this Signal Warrant Analysis for the Signal Hill Business Center project. As requested by City of Signal Hill engineering staff, the purpose of this Signal Warrant Analysis is to evaluate the potential need for installation of a traffic signal at the intersection of Walnut Avenue and Hill Street.

This analysis supplements the Signal Hill Business Center Traffic Impact Analysis (Kunzman Associates, Inc., Final July 2019) ["Project Traffic Impact Analysis"] and the Supplemental Afternoon School Peak Hour Analysis (Kunzman Associates, Inc, May 31, 2018). The project site is generally bounded by Gundry Avenue to the west, Gundry Hill Apartments and American University of Health Sciences to the north, Gaviota Avenue to the east, and the Signal Hill City Limits and Alamitos Avenue to the south. The project site is currently vacant. The proposed project involves developing the project site with a business park consisting of nine buildings totaling 139,080 square feet plus 12,000 square feet of mezzanine, for a total of 151,080 square feet of gross floor area. Full access driveways are proposed at Gundry Avenue, Walnut Avenue, and Alamitos Avenue. The proposed project is anticipated to be constructed and fully operational by Year 2020.

Although this is a technical report, effort has been made to write the report clearly and concisely. A glossary is provided in Appendix A to assist the reader with technical terms related to transportation engineering.

EXISTING ROADWAY CONDITIONS

The study intersection of Walnut Avenue at Hill Street is currently all-way stop controlled. Each approach provides one shared left/through/right turn lane, except for the southbound approach, which provides one shared left turn/through lane and one dedicated right turn lane. The study intersection provides school crosswalk markings on all four legs.

Walnut Avenue is a two lane undivided roadway trending in a north-south direction in the project vicinity. North of Hill Street, Walnut Avenue has a curb-to-curb width of approximately 52 feet with on-street parking permitted on both sides of the roadway. South of Hill Street, Walnut Avenue has a curb-to-curb width of approximately 42 feet with on-street parking permitted on both sides of the roadway. The posted speed limit on Walnut Avenue is 30 miles per hour in the project vicinity, except near the intersection at Hill Street where a school zone speed limit of 25 miles per hour applies when children are present.

Hill Street is a two lane undivided roadway trending in an east-west direction in the project vicinity. Hill Street has a curb-to-curb width of approximately 36 feet with on-street parking permitted on both sides of the roadway.

Existing vehicular and pedestrian volumes were obtained at the study intersection in October 2018 during typical weekday conditions. Appendix B contains the traffic count worksheets.

EXISTING TRAFFIC SIGNAL WARRANT ANALYSIS

The application of traffic control devices is governed by Federal standards adopted by the State of California and contained in the California Manual on Uniform Traffic Control Devices (California MUTCD, 2014). Part 4C – Traffic Control Signal Needs Studies of the California MUTCD contains a total of nine traffic signal warrants, or criteria, which serve to determine whether installation of a traffic signal is justified at a particular location. As noted in the California MUTCD, application of the traffic signal warrants should be based on engineering judgement; satisfaction of one or more traffic signal warrants shall not in itself require the installation of a traffic signal.

The traffic signal warrants are based on criteria for "urban" or "rural" settings. Urban criteria are used when the speed limit (or critical speed) for major street is 40 miles per hour or less. Rural criteria are used when the speed limit for the major street is greater than 40 miles per hour or the intersection is located in the built up area of an isolated community (i.e., population less than 10,000). For purposes of this traffic signal warrant analysis, the study area is considered urban since the posted speed limit is less than 40 miles per hour.

The following provides a brief summary of the evaluation for each of the traffic signal warrants based on existing conditions. Detailed traffic signal warrant worksheets are included in Appendix C.

Warrant 1 – Eight-Hour Vehicular Volume

Warrant 1 considers vehicular traffic volume for each of any eight hours of an average day. To determine if Warrant 1 is satisfied, eight hour vehicular volumes are evaluated against criteria for minimum vehicular volume (Condition A) and interruption of continuous traffic (Condition B). One or both conditions may be satisfied, or 80% of both conditions, for Warrant 1 to be satisfied. Based on the existing traffic data collected, Warrant 1 is not currently satisfied at the study intersection.

Warrant 2 – Four-Hour Vehicular Volume

Warrant 2 considers vehicular traffic volume for each of any four hours of an average day. To determine if Warrant 2 is satisfied, major street approach volumes versus the higher minor street approach volume are plotted against the applicable curve line (i.e., minimum volume criteria). Warrant 2 is satisfied if all four plotted points fall above the applicable curve. Based on the existing traffic data collected, Warrant 2 is not currently satisfied at the study intersection.

Warrant 3 – Peak Hour Vehicular Volume

Warrant 3 considers vehicular traffic volume for the peak hour of an average day. To determine if Warrant 3 is satisfied, major street approach volumes versus the higher minor street approach volume are plotted against the applicable curve line (i.e., minimum volume criteria). Warrant 3 is satisfied if the plotted point falls above

the applicable curve. Based on the existing traffic data collected, Warrant 3 is not currently satisfied at the study intersection.

Warrant 4 – Pedestrian Volume

Warrant 4 considers four-hour and peak hour pedestrian volumes compared to the traffic volumes on the major street on an average day. To determine if Warrant 4 is satisfied, four-hour and peak hour pedestrian volumes versus major street approach volumes are plotted against the applicable curve lines (i.e., minimum volume criteria). Warrant 4 is satisfied if the plotted points fall above the applicable curve. Based on the existing traffic data collected, Warrant 4 is not currently satisfied at the study intersection.

Warrant 5 – School Crossing

Warrant 5 considers the frequency and adequacy of gaps in the vehicular traffic stream as related to the number and size of groups of schoolchildren at an established school crossing across the major street. The California MUTCD defines "schoolchildren" as elementary through high school students. This warrant also requires a minimum of 20 school age pedestrians crossing the major street per hour.

As stated in the California MUTCD, before a decision is made to install a traffic control signal based on school crossing needs, consideration shall be given to the implementation of other remedial measures, such as warning signs and flashers, school speed zones, school crossing guards, or a grade-separated crossing. It should be noted that the study intersection is currently all-way stop-controlled, is located within a school speed zone, and provides a school crossing guard during school commute times. The presence of an adult crossing guard effectively ensures school-age children receive the necessary gaps for crossing the intersection. There were no reported collisions involving bicycles or pedestrians based on review of the collision records discussed under Warrant 7.

Based on the existing school crossing measures, Warrant 5 is not currently satisfied at the study intersection.

Warrant 6 – Coordinated Signal System

Warrant 6 considers whether a traffic signal may be necessary to maintain proper progression and platooning of vehicles in a coordinated traffic signal system. Neither Walnut Avenue nor Hill Street are required to maintain proper progression, therefore, Warrant 6 is not currently satisfied at the study intersection.

Warrant 7 – Crash Experience

Warrant 7 considers the severity and frequency of traffic collisions within a 12-month period that are susceptible to correction by installation of a traffic signal, such as broadside or right-of-way violations involving vehicles, bicycles, or pedestrians.

Collision records were obtained for the period from January 1, 2013 to November 2, 2018. Collision history for January 2013 to December 2017 was mapped using the Transportation Injury Mapping System (TIMS) developed by University of California, Berkeley. Since the TIMS database does not currently include collision records for 2018, additional records for the period from January 1, 2018 to November 2, 2018 were obtained from the Statewide Integrated Traffic Records System (SWITRS). Collision records are provided in Appendix D.

A total of five collisions were reported within 100 feet of the study intersection during the review period. Only three of the five collisions within 100 feet of the study intersection are susceptible to correction by installation of a traffic signal, two of which occurred within a 12-month period. Based on review of collision records obtained, Warrant 7 is not currently satisfied at the study intersection.

Warrant 8 – Roadway Network

Warrant 8 considers whether installation of a traffic signal would be justified to encourage concentration and organization of traffic flow on a roadway network. All parts of Warrant 8 must be satisfied, including minimum peak hour volumes, 5-year projected volumes, and major route characteristics. Consistent with the Signal Hill Business Center Traffic Impact Analysis, five-year projected volumes were determined by increasing existing volumes by one-percent (1%) per year over a five-year period. Based on the existing traffic data collected, Warrant 8 is not currently satisfied at the study intersection.

Warrant 9 – Intersection Near a Grade Crossing

Warrant 9 considers the proximity to the intersection of a railway grade crossing on an intersection approach controlled by a STOP or YIELD sign. This warrant does not apply since there are no railway grade crossings in the project vicinity.

FUTURE CONDITIONS

The Project Traffic Impact Analysis and the Supplemental Afternoon School Peak Hour Analysis contain future traffic volume projections for the AM, School PM, and PM peak hours. Based on the peak hour traffic signal warrants for General Plan Buildout With Project volumes, a traffic signal is not forecast to be warranted for future conditions. The future conditions peak hour traffic signal warrant worksheets are provided in Appendix E.

CONCLUSION

The following is a summary of the results of the traffic signal warrant analysis for existing conditions:

Traffic Signal Warrant	Satisfied?
Warrant 1 - Eight Hour Vehicular Volume	No
Warrant 2 - Four Hour Vehicular Volume	No
Warrant 3 - Peak Hour Vehicular Volume	No
Warrant 4 - Pedestrian Volume	No
Warrant 5 - School Crossing	No
Warrant 6 - Coordinated Signal System	No
Warrant 7 - Crash Experience	No
Warrant 8 - Roadway Network	No
Warrant 9 - Intersection Near Grade Crossing	Not Applicable

Mr. Jesus Saldana, Senior Engineering Technician
CITY OF SIGNAL HILL
July 5, 2019

Since none of the traffic signal warrants are currently satisfied, installation of a traffic signal at the study intersection is not warranted based on existing conditions.

Based on the peak hour traffic signal warrants for General Plan Buildout With Project volumes, a traffic signal is not forecast to be warranted for future conditions.

We appreciate the opportunity to assist you on this project. Should you have any questions or if we can be of further assistance, please do not hesitate to call at (714) 795-3100.

Sincerely,

Giancarlo Ganddini, PE, PTP
Principal



APPENDIX A

GLOSSARY

GLOSSARY OF TERMS

ACRONYMS

AC	Acres
ADT	Average Daily Traffic
Caltrans	California Department of Transportation
DU	Dwelling Unit
ICU	Intersection Capacity Utilization
LOS	Level of Service
TSF	Thousand Square Feet
V/C	Volume/Capacity
VMT	Vehicle Miles Traveled

TERMS

AVERAGE DAILY TRAFFIC: The average 24-hour volume for a stated period divided by the number of days in that period. For example, Annual Average Daily Traffic is the total volume during a year divided by 365 days.

BANDWIDTH: The number of seconds of green time available for through traffic in a signal progression.

BOTTLENECK: A point of constriction along a roadway that limits the amount of traffic that can proceed downstream from its location.

CAPACITY: The maximum number of vehicles that can be reasonably expected to pass over a given section of a lane or a roadway in a given time period.

CHANNELIZATION: The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movements of both vehicles and pedestrians.

CLEARANCE INTERVAL: Nearly same as yellow time. If there is an all red interval after the end of a yellow, then that is also added into the clearance interval.

CONTROL DELAY: The component of delay, typically expressed in seconds per vehicle, resulting from the type of traffic control at an intersection. Control delay is measured by comparison with the uncontrolled condition; it includes delay incurred by slowing down, stopping/waiting, and speeding up.

CORDON: An imaginary line around an area across which vehicles, persons, or other items are counted (in and out).

CORNER SIGHT DISTANCE: The minimum sight distance required by the driver of a vehicle to cross or enter the lanes of the major roadway without requiring approaching traffic travelling at a given speed to radically alter their speed or trajectory. Corner sight distance is measured from the driver's eye at 42 inches above the pavement to an object height of 36 inches above the pavement in the center of the nearest approach lane.

CYCLE LENGTH: The time period in seconds required for a traffic signal to complete one full cycle of indications.

CUL-DE-SAC: A local street open at one end only and with special provisions for turning around.

DAILY CAPACITY: A theoretical value representing the daily traffic volume that will typically result in a peak hour volume equal to the capacity of the roadway.

DELAY: The time consumed while traffic is impeded in its movement by some element over which it has no control, usually expressed in seconds per vehicle.

DEMAND RESPONSIVE SIGNAL: Same as traffic-actuated signal.

DENSITY: The number of vehicles occupying in a unit length of the through traffic lanes of a roadway at any given instant. Usually expressed in vehicles per mile.

DETECTOR: A device that responds to a physical stimulus and transmits a resulting impulse to the signal controller.

DESIGN SPEED: A speed selected for purposes of design. Features of a highway, such as curvature, superelevation, and sight distance (upon which the safe operation of vehicles is dependent) are correlated to design speed.

DIRECTIONAL SPLIT: The percent of traffic in the peak direction at any point in time.

DIVERSION: The rerouting of peak hour traffic to avoid congestion.

FORCED FLOW: Opposite of free flow.

FREE FLOW: Volumes are well below capacity. Vehicles can maneuver freely and travel is unimpeded by other traffic.

GAP: Time or distance between successive vehicles in a traffic stream, rear bumper to front bumper.

HEADWAY: Time or distance spacing between successive vehicles in a traffic stream, front bumper to front bumper.

INTERCONNECTED SIGNAL SYSTEM: A number of intersections that are connected to achieve signal progression.

LEVEL OF SERVICE: A qualitative measure of a number of factors, which include speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs.

LOOP DETECTOR: A vehicle detector consisting of a loop of wire embedded in the roadway, energized by alternating current and producing an output circuit closure when passed over by a vehicle.

MINIMUM ACCEPTABLE GAP: Smallest time headway between successive vehicles in a traffic stream into which another vehicle is willing and able to cross or merge.

MULTI-MODAL: More than one mode; such as automobile, bus transit, rail rapid transit, and bicycle transportation modes.

OFFSET: The time interval in seconds between the beginning of green at one intersection and the beginning of green at an adjacent intersection.

PLATOON: A closely grouped component of traffic that is composed of several vehicles moving, or standing ready to move, with clear spaces ahead and behind.

PASSENGER CAR EQUIVALENT (PCE): A metric used to assess the impact of larger vehicles, such as trucks, recreational vehicles, and buses, by converting the traffic volume of larger vehicles to an equivalent number of passenger cars.

PEAK HOUR: The 60 consecutive minutes with the highest number of vehicles.

PRETIMED SIGNAL: A type of traffic signal that directs traffic to stop and go on a predetermined time schedule without regard to traffic conditions. Also, fixed time signal.

PROGRESSION: A term used to describe the progressive movement of traffic through several signalized intersections.

QUEUE: The number of vehicles waiting at a service area such as a traffic signal, stop sign, or access gate.

QUEUE LENGTH: The length of vehicle queue, typically expressed in feet, waiting at a service area such as a traffic signal, stop sign, or access gate.

SCREEN-LINE: An imaginary line or physical feature across which all trips are counted, normally to verify the validity of mathematical traffic models.

SHARED/RECIPROCAL PARKING AGREEMENT: A written binding document executed between property owners to provide a designated number of off-street parking stalls within a designated area to be available for specified businesses or land uses.

SIGHT DISTANCE: The continuous length of roadway visible to a driver or roadway user.

SIGNAL CYCLE: The time period in seconds required for one complete sequence of signal indications.

SIGNAL PHASE: The part of the signal cycle allocated to one or more traffic movements.

STACKING DISTANCE: The length of area available behind a service area, such as a traffic signal or gate, for vehicle queueing to occur.

STARTING DELAY: The delay experienced in initiating the movement of queued traffic from a stop to an average running speed through an intersection.

STOPPING SIGHT DISTANCE: The minimum distance required by the driver of a vehicle on the major roadway travelling at a given speed to bring the vehicle to a stop after an object on the road becomes visible. Stopping sight distance is measured from the driver's eye at 42 inches above the pavement to an object height of 6 inches above the pavement.

TRAFFIC-ACTUATED SIGNAL: A type of traffic signal that directs traffic to stop and go in accordance with the demands of traffic, as registered by the actuation of detectors.

TRIP: The movement of a person or vehicle from one location (origin) to another (destination). For example, from home to store to home is two trips, not one.

TRIP-END: One end of a trip at either the origin or destination (i.e., each trip has two trip-ends). A trip-end occurs when a person, object, or message is transferred to or from a vehicle.

TRIP GENERATION RATE: The quantity of trips produced and/or attracted by a specific land use stated in terms of units such as per dwelling, per acre, and per 1,000 square feet of floor space.

TRUCK: A vehicle having dual tires on one or more axles, or having more than two axles.

TURNING RADIUS: The circular arc formed by the smallest turning path radius of the front outside tire of a vehicle, such as that performed by a U-turn maneuver. This is based on the length and width of the wheel base as well as the steering mechanism of the vehicle.

UNBALANCED FLOW: Heavier traffic flow in one direction than the other. On a daily basis, most facilities have balanced flow. During the peak hours, flow is seldom balanced in an urban area.

VEHICLE MILES OF TRAVEL: A measure of the amount of usage of a section of highway, obtained by multiplying the average daily traffic by length of facility in miles.

APPENDIX B

VOLUME COUNT WORKSHEETS

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Signal Hill
N/S: Walnut Avenue
E/W: Hill Street
Weather: Clear

File Name : SGH_Walnut_Hill 12
Site Code : 22518786
Start Date : 10/18/2018
Page No : 1

Groups Printed- Total Volume

	Walnut Avenue Southbound				Hill Street Westbound				Walnut Avenue Northbound				Hill Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	17	2	19	8	10	6	24	0	38	1	39	6	10	1	17	99
07:15 AM	5	22	7	34	5	19	8	32	4	50	2	56	8	12	5	25	147
07:30 AM	23	34	35	92	11	13	16	40	5	54	1	60	7	24	9	40	232
07:45 AM	16	39	50	105	15	18	8	41	13	49	6	68	10	19	18	47	261
Total	44	112	94	250	39	60	38	137	22	191	10	223	31	65	33	129	739
08:00 AM	16	42	43	101	18	16	6	40	9	47	7	63	7	13	19	39	243
08:15 AM	0	40	11	51	8	17	0	25	6	45	4	55	7	26	12	45	176
08:30 AM	0	41	6	47	6	20	4	30	9	44	4	57	6	50	24	80	214
08:45 AM	5	35	2	42	5	32	7	44	16	48	3	67	12	60	29	101	254
Total	21	158	62	241	37	85	17	139	40	184	18	242	32	149	84	265	887
09:00 AM	4	26	9	39	2	16	4	22	5	51	2	58	1	18	3	22	141
09:15 AM	2	31	10	43	8	8	9	25	2	33	1	36	7	15	3	25	129
09:30 AM	6	36	23	65	11	11	12	34	3	30	7	40	4	10	5	19	158
09:45 AM	4	23	12	39	1	9	3	13	5	35	0	40	6	7	4	17	109
Total	16	116	54	186	22	44	28	94	15	149	10	174	18	50	15	83	537
10:00 AM	9	15	7	31	8	13	4	25	1	38	1	40	3	9	6	18	114
10:15 AM	3	22	4	29	3	22	4	29	3	28	2	33	4	11	2	17	108
10:30 AM	9	25	4	38	4	12	8	24	3	28	8	39	4	10	5	19	120
10:45 AM	5	22	9	36	4	9	5	18	3	25	4	32	4	4	1	9	95
Total	26	84	24	134	19	56	21	96	10	119	15	144	15	34	14	63	437
11:00 AM	6	27	14	47	4	11	5	20	2	32	0	34	6	11	3	20	121
11:15 AM	1	24	24	49	4	12	4	20	0	35	2	37	6	6	3	15	121
11:30 AM	4	32	12	48	7	8	6	21	2	46	3	51	5	11	2	18	138
11:45 AM	1	32	9	42	3	17	4	24	4	51	4	59	5	10	2	17	142
Total	12	115	59	186	18	48	19	85	8	164	9	181	22	38	10	70	522
12:00 PM	10	36	8	54	3	13	4	20	11	57	15	83	9	22	3	34	191
12:15 PM	7	37	7	51	6	16	7	29	1	50	5	56	3	11	2	16	152
12:30 PM	8	47	5	60	7	16	5	28	2	43	8	53	1	14	1	16	157
12:45 PM	6	40	8	54	11	18	13	42	5	42	5	52	9	14	5	28	176
Total	31	160	28	219	27	63	29	119	19	192	33	244	22	61	11	94	676
01:00 PM	7	30	7	44	4	16	4	24	6	35	1	42	8	8	4	20	130
01:15 PM	13	29	16	58	5	11	3	19	8	47	2	57	6	13	14	33	167
01:30 PM	15	37	34	86	5	30	4	39	9	41	5	55	6	19	16	41	221
01:45 PM	14	36	39	89	6	10	8	24	2	56	7	65	4	13	8	25	203
Total	49	132	96	277	20	67	19	106	25	179	15	219	24	53	42	119	721
02:00 PM	6	32	14	52	3	25	3	31	3	45	6	54	7	17	3	27	164
02:15 PM	5	24	10	39	2	17	10	29	6	31	5	42	5	8	2	15	125
02:30 PM	4	37	4	45	7	16	2	25	2	41	3	46	3	16	3	22	138
02:45 PM	3	38	10	51	5	10	3	18	4	49	10	63	9	11	8	28	160
Total	18	131	38	187	17	68	18	103	15	166	24	205	24	52	16	92	587
03:00 PM	1	31	11	43	5	15	5	25	2	57	3	62	6	25	4	35	165
03:15 PM	5	39	9	53	6	19	6	31	2	42	2	46	1	14	2	17	147
03:30 PM	9	45	7	61	5	10	5	20	5	47	7	59	7	40	20	67	207
03:45 PM	8	43	9	60	6	54	12	72	29	50	5	84	2	48	15	65	281
Total	23	158	36	217	22	98	28	148	38	196	17	251	16	127	41	184	800
04:00 PM	11	45	8	64	5	13	7	25	9	45	9	63	10	22	5	37	189
04:15 PM	4	49	11	64	5	22	5	32	5	41	4	50	9	14	5	28	174
04:30 PM	7	47	10	64	1	13	3	17	5	62	5	72	1	18	7	26	179
04:45 PM	7	37	11	55	4	15	9	28	12	56	4	72	3	19	4	26	181
Total	29	178	40	247	15	63	24	102	31	204	22	257	23	73	21	117	723

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Signal Hill
N/S: Walnut Avenue
E/W: Hill Street
Weather: Clear

File Name : SGH_Walnut_Hill 12
Site Code : 22518786
Start Date : 10/18/2018

Groups Printed- Total Volume

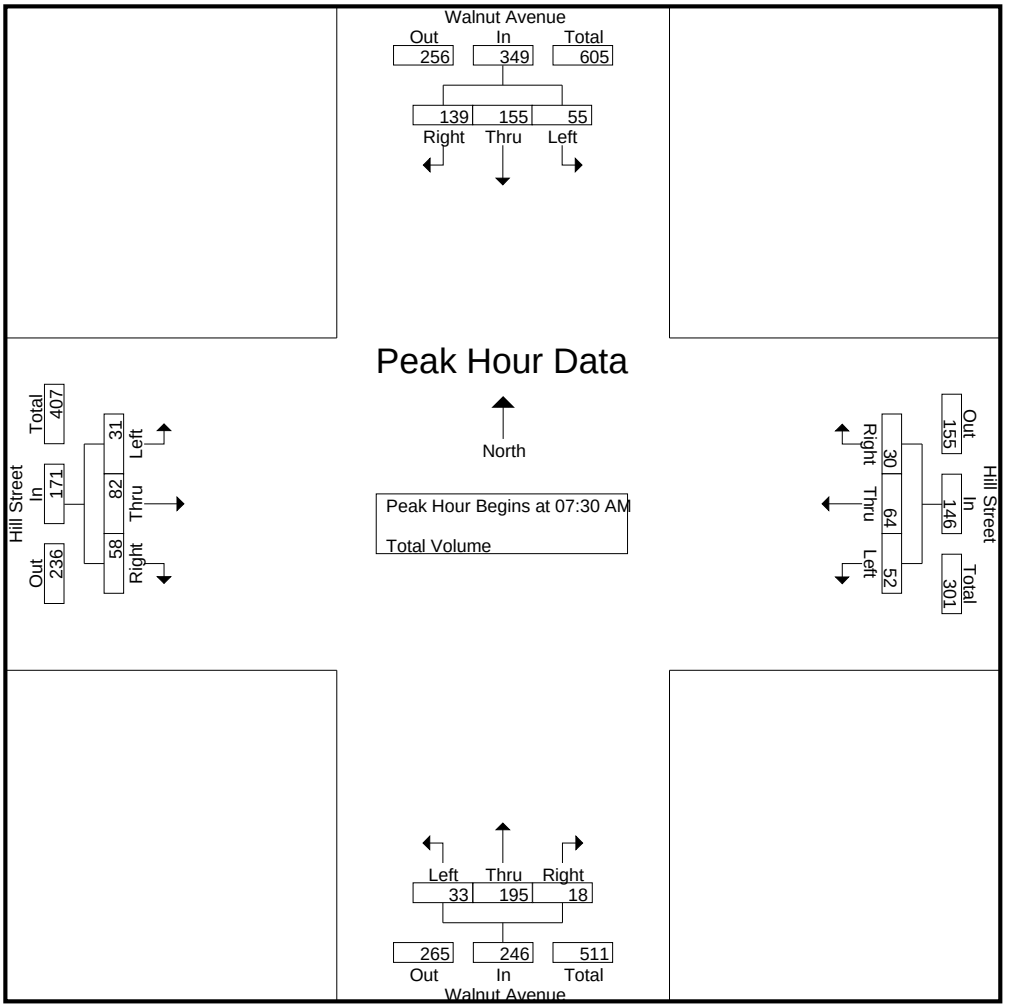
	Walnut Avenue Southbound				Hill Street Westbound				Walnut Avenue Northbound				Hill Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
05:00 PM	9	57	15	81	0	12	8	20	8	53	7	68	10	29	2	41	210
05:15 PM	9	54	11	74	2	17	7	26	4	50	7	61	7	22	3	32	193
05:30 PM	13	54	18	85	7	18	4	29	3	57	6	66	4	15	1	20	200
05:45 PM	14	56	22	92	3	22	8	33	9	41	1	51	8	11	7	26	202
Total	45	221	66	332	12	69	27	108	24	201	21	246	29	77	13	119	805
06:00 PM	6	44	10	60	4	18	7	29	0	35	10	45	13	23	7	43	177
06:15 PM	5	44	16	65	7	25	6	38	1	49	6	56	3	16	3	22	181
06:30 PM	2	64	7	73	6	19	1	26	3	39	5	47	5	20	5	30	176
06:45 PM	7	43	6	56	8	21	3	32	3	37	4	44	8	12	4	24	156
Total	20	195	39	254	25	83	17	125	7	160	25	192	29	71	19	119	690
Grand Total	334	1760	636	2730	273	804	285	1362	254	2105	219	2578	285	850	319	1454	8124
Apprch %	12.2	64.5	23.3		20	59	20.9		9.9	81.7	8.5		19.6	58.5	21.9		
Total %	4.1	21.7	7.8	33.6	3.4	9.9	3.5	16.8	3.1	25.9	2.7	31.7	3.5	10.5	3.9	17.9	

	Walnut Avenue Southbound				Hill Street Westbound				Walnut Avenue Northbound				Hill Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 06:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	**23**	34	35	92	11	13	**16**	40	5	**54**	1	60	7	24	9	40	232
07:45 AM	16	39	**50**	**105**	15	**18**	8	**41**	**13**	49	6	**68**	**10**	19	18	**47**	**261**
08:00 AM	16	**42**	43	101	**18**	16	6	40	9	47	**7**	63	7	13	**19**	39	243
08:15 AM	0	40	11	51	8	17	0	25	6	45	4	55	7	**26**	12	45	176
Total Volume	55	155	139	349	52	64	30	146	33	195	18	246	31	82	58	171	912
% App. Total	15.8	44.4	39.8		35.6	43.8	20.5		13.4	79.3	7.3		18.1	48	33.9		
PHF	.598	.923	.695	.831	.722	.889	.469	.890	.635	.903	.643	.904	.775	.788	.763	.910	.874

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Peak Hour Analysis From 07:00 AM to 06:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:15 AM				04:30 PM				08:00 AM			
+0 mins.	**23**	34	35	92	5	**19**	8	32	5	**62**	5	**72**	7	13	19	39
+15 mins.	16	39	**50**	**105**	11	13	**16**	40	**12**	56	4	72	7	26	12	45
+30 mins.	16	**42**	43	101	15	18	8	**41**	8	53	**7**	68	6	50	24	80
+45 mins.	0	40	11	51	**18**	16	6	40	4	50	7	61	**12**	**60**	**29**	**101**
Total Volume	55	155	139	349	49	66	38	153	29	221	23	273	32	149	84	265
% App. Total	15.8	44.4	39.8		32	43.1	24.8		10.6	81	8.4		12.1	56.2	31.7	
PHF	.598	.923	.695	.831	.681	.868	.594	.933	.604	.891	.821	.948	.667	.621	.724	.656

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Weather: Clear

File Name : SGH_Walnut_Hill 12
Site Code : 22518786
Start Date : 10/18/2018

Groups Printed- Bikes

	Walnut Avenue Southbound				Hill Street Westbound				Walnut Avenue Northbound				Hill Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	3
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
Total	0	1	0	1	0	0	0	0	0	4	0	4	0	0	0	0	5
08:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
08:15 AM	0	0	2	2	0	1	0	1	0	0	0	0	0	0	0	0	3
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	2	2	0	1	0	1	0	1	0	1	1	1	0	2	6
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
10:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
10:45 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	1	2	0	0	0	0	0	1	0	1	0	0	0	0	3
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
01:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	1	2	0	0	0	0	0	1	0	1	0	0	0	0	3
03:00 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
03:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
03:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	2	0	0	0	0	0	2	0	2	0	0	0	0	4
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	0	1	1	0	1	0	1	0	0	0	0	0	1	0	1	3
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	1	2	0	1	0	1	0	0	0	0	0	1	0	1	4

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Groups Printed- Bikes

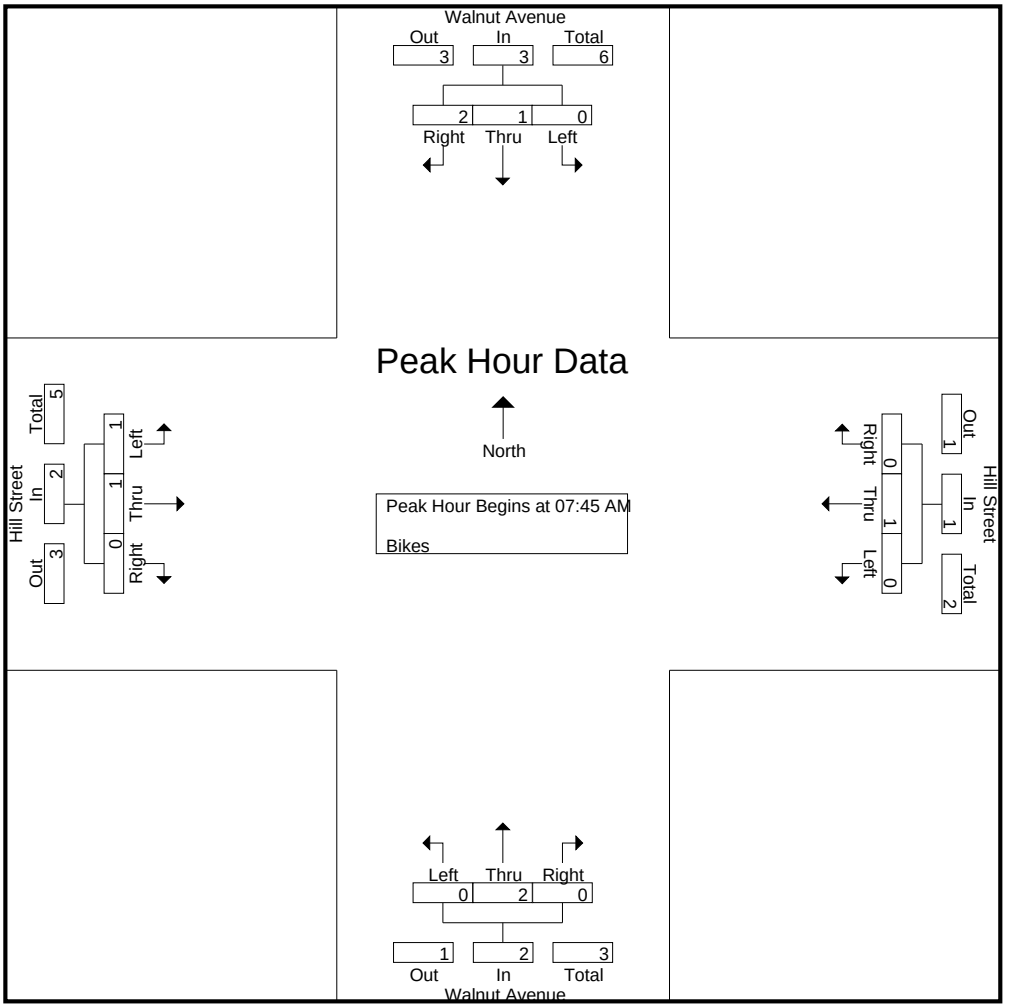
	Walnut Avenue Southbound				Hill Street Westbound				Walnut Avenue Northbound				Hill Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	1	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
Total	0	1	0	1	0	0	0	0	0	3	0	3	1	0	0	1	5
06:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
06:30 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
06:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	1	2	0	0	0	0	0	1	0	1	0	0	0	0	3
Grand Total	1	10	7	18	0	3	0	3	0	13	0	13	2	2	0	4	38
Apprch %	5.6	55.6	38.9		0	100	0		0	100	0		50	50	0		
Total %	2.6	26.3	18.4	47.4	0	7.9	0	7.9	0	34.2	0	34.2	5.3	5.3	0	10.5	

	Walnut Avenue Southbound				Hill Street Westbound				Walnut Avenue Northbound				Hill Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 06:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	**1**	0	1	0	0	0	0	0	**1**	0	**1**	0	0	0	0	2
08:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	**1**	0	**1**	2
08:15 AM	0	0	**2**	**2**	0	**1**	0	**1**	0	0	0	0	0	0	0	0	**3**
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	1	1
Total Volume	0	1	2	3	0	1	0	1	0	2	0	2	1	1	0	2	8
% App. Total	0	33.3	66.7		0	100	0		0	100	0		50	50	0		
PHF	.000	.250	.250	.375	.000	.250	.000	.250	.000	.500	.000	.500	.250	.250	.000	.500	.667

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Peak Hour Analysis From 07:00 AM to 06:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:15 AM				07:45 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	**3**	0	**3**	0	0	0	0
+15 mins.	0	**1**	0	1	0	0	0	0	0	0	0	0	0	**1**	0	**1**
+30 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
+45 mins.	0	0	**2**	**2**	0	**1**	0	**1**	0	1	0	1	**1**	0	0	1
Total Volume	0	1	2	3	0	1	0	1	0	5	0	5	1	1	0	2
% App. Total	0	33.3	66.7		0	100	0		0	100	0		50	50	0	
PHF	.000	.250	.250	.375	.000	.250	.000	.250	.000	.417	.000	.417	.250	.250	.000	.500

Location: Signal Hill
N/S: Walnut Avenue
E/W: Hill Street

Date: 10/18/2018
Day: Thursday

PEDESTRIANS

Time	North Leg Walnut Avenue	East Leg Hill Street	South Leg Walnut Avenue	West Leg Hill Street	TOTAL
7:00 AM	2	1	0	0	3
7:15 AM	1	0	1	0	2
7:30 AM	1	1	1	3	6
7:45 AM	14	3	3	22	42
8:00 AM	30	20	6	28	84
8:15 AM	1	0	1	4	6
8:30 AM	1	3	0	1	5
8:45 AM	0	0	1	1	2
9:00 AM	2	2	2	0	6
9:15 AM	4	2	4	12	22
9:30 AM	4	2	2	18	26
9:45 AM	0	3	3	0	6
10:00 AM	0	3	2	3	8
10:15 AM	0	2	1	0	3
10:30 AM	0	0	0	0	0
10:45 AM	2	4	1	3	10
11:00 AM	3	0	0	2	5
11:15 AM	3	1	2	14	20
11:30 AM	3	1	0	4	8
11:45 AM	6	2	0	4	12
12:00 PM	6	0	2	9	17
12:15 PM	1	2	2	0	5
12:30 PM	4	2	0	2	8
12:45 PM	0	0	0	0	0
1:00 PM	1	0	0	3	4
1:15 PM	7	1	6	16	30
1:30 PM	26	10	5	30	71
1:45 PM	10	7	1	6	24
2:00 PM	2	0	2	3	7
2:15 PM	1	2	0	0	3
2:30 PM	2	2	2	2	8
2:45 PM	0	0	0	1	1
3:00 PM	0	0	1	0	1
3:15 PM	1	1	0	1	3
3:30 PM	0	0	2	0	2
3:45 PM	0	2	0	1	3
4:00 PM	0	0	1	0	1
4:15 PM	0	0	1	1	2
4:30 PM	0	0	1	1	2
4:45 PM	0	1	1	0	2
5:00 PM	3	3	4	0	10
5:15 PM	0	4	8	0	12
5:30 PM	1	0	1	2	4
5:45 PM	1	3	4	5	13
6:00 PM	0	0	5	2	7
6:15 PM	1	1	2	1	5
6:30 PM	4	1	2	1	8
6:45 PM	4	0	3	3	10
TOTAL VOLUMES:	152	92	86	209	539

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APPENDIX C

TRAFFIC SIGNAL WARRANT WORKSHEETS

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 1 of 5)

Count Date: 10/18/2018

City of Signal Hill — Jurisdiction
Walnut Ave/Hill St — Intersection
Calc: _____ Date: _____
Check: _____ Date: _____

Major St: Walnut Ave — Critical Approach Speed: 25 mph
Minor St: Hill St — Critical Approach Speed: N/A mph

☐ eed limit or critical speed on major street traffic > 40 mph .....
or
☐ built up area of isolated community of < 10,000 population ..... } RURAL (R)

☑ URBAN (U)

WARRANT 1 - Eight Hour Vehicular Volume

SATISFIED ☐ YES ☑ NO

(Condition A or Condition B or Combination of A and B must be satisfied)

Condition A - Minimum Vehicle Volume

100% SATISFIED ☐ YES ☑ NO
80% SATISFIED ☐ YES ☑ NO

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)												
	Urban	Rural	Urban	Rural									
APPROACH LANES	1		2 or More		5:00 PM	4:00 PM	1:00 PM	8:00 AM	7:00 AM	3:00 PM	12:00 PM	6:00 PM	Hour
Both Approaches Major Street	500 (400)	350 (280)	600 (480)	420 (336)	578	504	496	483	473	468	463	446	
Highest Approach Minor Street	150 (120)	105 (84)	200 (160)	140 (112)	119	117	119	265	137	184	119	125	

Condition B - Interruption of Continuous Traffic

100% SATISFIED ☐ YES ☑ NO
80% SATISFIED ☐ YES ☑ NO

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)												
	Urban	Rural	Urban	Rural									
APPROACH LANES	1		2 or More		5:00 PM	4:00 PM	1:00 PM	8:00 AM	7:00 AM	3:00 PM	12:00 PM	6:00 PM	Hour
Both Approaches Major Street	750 (600)	525 (420)	900 (720)	630 (504)	578	504	496	483	473	468	463	446	
Highest Approach Minor Street	75 (60)	53 (42)	100 (80)	70 (56)	119	117	119	265	137	184	119	125	

Combination of Conditions A & B

SATISFIED ☐ YES ☑ NO

REQUIREMENT	CONDITION	X	FULFILLED
TWO CONDITIONS SATISFIED 80%	A. Minimum Vehicular Volume		☐ YES ☑ NO
	AND, B. Interruption of Continuous Traffic		
AND, an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems			☐ YES ☑ NO

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 5)

WARRANT 2 - Four Hour Vehicular Volume

SATISFIED* ☐ YES ☑ NO

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	One	2 or More	8:00 AM	3:00 PM	5:00 PM	7:00 AM	Hour
Both Approaches - Major Street	X		483	468	578	473	
Higher Approach - Minor Street	X		265	184	119	137	

*All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS)	☐ YES	☑ NO
OR, All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS)	☐ YES	☑ NO

WARRANT 3 - Peak Hour

SATISFIED ☐ YES ☑ NO

(Part A or Part B must be satisfied)

PART A

SATISFIED ☐ YES ☑ NO

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	☐ YES	☑ NO
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND	☑ YES	☐ NO
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches	☑ YES	☐ NO

PART B

SATISFIED ☐ YES ☑ NO

APPROACH LANES	One	2 or More	8:00 AM
Both Approaches - Major Street	X		483
Higher Approach - Minor Street	X		265

The plotted point falls above the applicable curve in Figure 4C-3. (URBAN AREAS)	☐ YES	☑ NO
OR, The plotted point falls above the applicable curve in Figure 4C-4. (RURAL AREAS)	☐ YES	☑ NO

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 3 of 5)

WARRANT 4 - Pedestrian Volume
(Parts 1 and 2 Must Be Satisfied)

SATISFIED ☐ YES ☑ NO

Part 1 (Parts A or B must be satisfied)

A.

Hours - - - >	1:00 PM	8:00 AM	7:00 AM	9:00 AM
Vehicles per hour for any 4 hours	496	483	473	360
Pedestrians per hour for any 4 hours	73	57	30	39

Figure 4C-5 or Figure 4C-6
SATISFIED ☐ YES ☑ NO

B.

Hours - - - >	1:00 PM
Vehicles per hour for any 1 hour	496
Pedestrians per hour for any 1 hour	73

Figure 4C-7 or Figure 4C-8
SATISFIED ☐ YES ☑ NO

Part 2 **SATISFIED** ☑ YES ☐ NO

AND, The distance to the nearest traffic signal along the major street is greater than 300 ft.	☑ YES	☐ NO
OR, The proposed traffic signal will not restrict progressive traffic flow along the major street.	☐ YES	☑ NO

WARRANT 5 - School Crossing
(Part A and Part B must be satisfied)

SATISFIED ☐ YES ☑ NO

Part A **SATISFIED** ☐ YES ☑ NO

Gap/Minutes and # of Children — 12:00 AM — Hour

Gaps vs Minutes	Minutes Children Using Crossing	n/a
	Number of Adequate Gaps	n/a
School Age Pedestrians Crossing Street / hr		0

Gaps < Minutes ☐ YES ☐ NO
AND Children > 20/hr ☑ YES ☐ NO

AND Consideration has been given to less restrictive remedial measures.*	☐ YES	☑ NO

Existing adult crossing guard ensures adequate gaps are provided.

Part B **SATISFIED** ☑ YES ☐ NO

The distance to the nearest traffic signal along the major street is greater than 300 ft.	☑ YES	☐ NO
OR, The proposal signal will not restrict the progressive movement of traffic.	☐ YES	☐ NO

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 4 of 5)

WARRANT 6 - Coordinated Signal System **SATISFIED** ☐ YES ☑ NO
(All Parts Must Be Satisfied)

Minimum Requirements	DISTANCE TO NEAREST SIGNAL				
≥ 1000 ft.	N **N/A**	S **N/A**	E **N/A**	W **N/A**	☐ YES ☑ NO
On a one-way street or a street that has traffic predominantly in any direction, the adjacent traffic control signals are so far apart that they do not provide the necessary degree of vehicular platooning.					
OR, On a two-way street, adjacent traffic control signal do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive operation.					☐ YES ☑ NO

WARRANT 7 - Crash Experience Warrant **SATISFIED** ☐ YES ☑ NO
(All Parts Must Be Satisfied)

Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency.			☐ YES ☑ NO
REQUIREMENTS	Number of crashes reported within a 12 month period susceptible to correction by a traffic signal, and involving injury or damage exceeding the requirements for a reportable crash.		☐ YES ☑ NO
5 OR MORE	**2**		
REQUIREMENTS	CONDITIONS	✓	
ONE CONDITION SATISFIED 80%	Warrant 1, Condition A - Minimum Vehicular Volume		☐ YES ☑ NO
	OR, Warrant 1, Condition B - Interruption of Continuous Traffic		
	OR, Warrant 4, Pedestrian Volume Condition - Ped Vol ≥ 152 for any hour OR, Ped Vol ≥ 80 for any 4 hours		

WARRANT 8 - Roadway Network **SATISFIED** ☐ YES ☑ NO
(All Parts Must Be Satisfied)

Minimum Volume REQUIREMENTS	ENTERING VOLUMES - ALL APPROACHES		✓	FUFILLED
1000 Veh/Hr	During Typical Weekday Peak Hour **912** Veh/Hr and has 5-year projected traffic volumes that meet one or more of Warrants 1, 2, and 3 during an average weekday			☐ Yes ☑ No
	OR During Each of Any 5 Hrs. of a Sat or Sun **0** Veh/Hr			
CHARACTERISTICS OF MAJOR ROUTES		MAJOR ROUTE A	MAJOR ROUTE B	
Hwy. System Serving as Principal Network for Through Traffic				
Rural or Suburban Highway Outside Of, Entering, or Traversing a City				
Appears as Major Route on an Official Plan				
Any Major Route Characteristics Met, Both Streets				☐ Yes ☑ No

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 5 of 5)

WARRANT 9 - Intersection Near a Grade Crossing (Both Parts A and B Must Be Satisfied) N/A **SATISFIED** ☐ YES ☑ NO

PART A

A grade crossing exists on an approach controlled by a STOP or YIELD sign and the center of the track nearest to the intersection is within 140 feet of the stop line or yield line on the approach. Track Center Line to Limit Line 0 ft.

☑ YES ☐ NO

PART B

There is one minor street approach lane at the track crossing - During the highest traffic volume hour during which rail traffic uses the crossing, the plotted point falls above the applicable curve in Figure 4C-9.

Major Street - Total of both approaches: 0 VPH

Minor Street - Crosses the track (one direction only, approaching the intersection):

0 VPH X AF (Use Table 4C-2, 3 & 4 below to calculate AF) = 0 VPH

OR, There are two or more minor street approach lanes at the track crossing -

During the highest traffic volume hour during which rail traffic uses the crossing, the plotted point falls above the applicable curve in Figure 4C-10.

☐ YES ☐ NO

Major Street - Total of both approaches: 0 VPH

Minor Street - Crosses the track (one direction only, approaching the intersection):

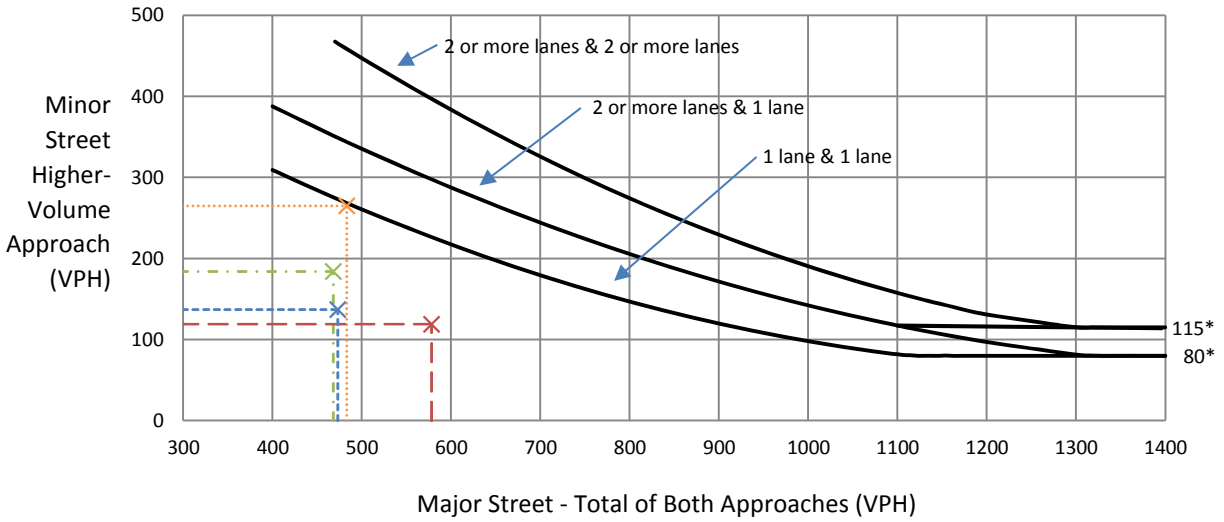
0 VPH X AF (Use Tables 4C-2, 3, & 4 below to calculate AF) = 0 VPH

The minor street approach volume may be multiplied up to three following adjustment factors (AF) as described in Section 4C.10.

1- Number of Rail Traffic per Day	0	Adjustment factor from table 4C-2	0
2- Percentage of High-Occupancy Buses on Minor Street Approach	0	Adjustment factor from table 4C-3	0
3- Percentage of Tractor-Trailer Trucks on Minor Street Approach	0	Adjustment factor from table 4C-4	0

NOTE: If no data is available or know, then use AF = 1 (no adjustment)

Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



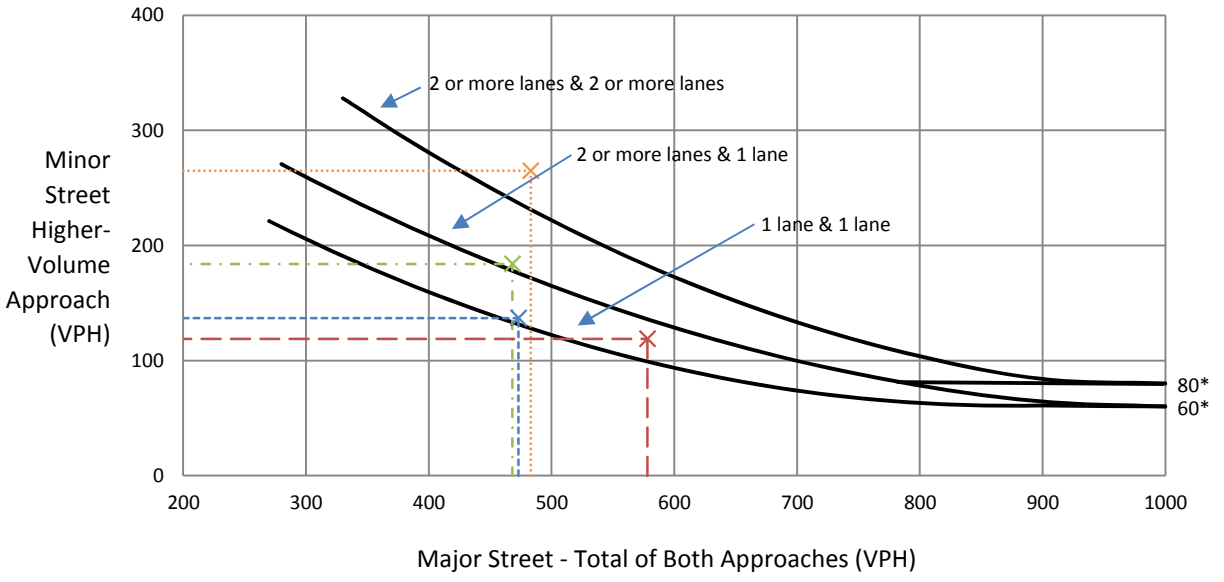
Traffic Signal Warrant Is NOT Satisfied

*Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor street approach with one lane.

**CAUTION: One or more points are within the margin of error (within 5 vehicles of the curve).

Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

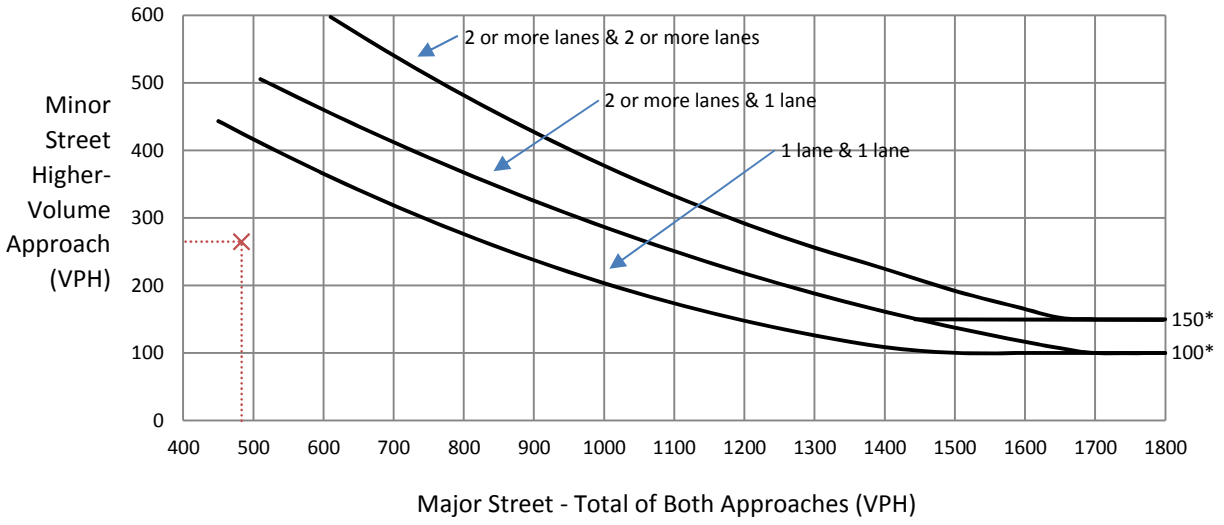
(Community less than 10,000 population or above 40 mph on the major street)



This figure is not applicable; see Figure 4C-1 above.

*Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure 4C-3. Warrant 3, Peak Hour Vehicular Volume

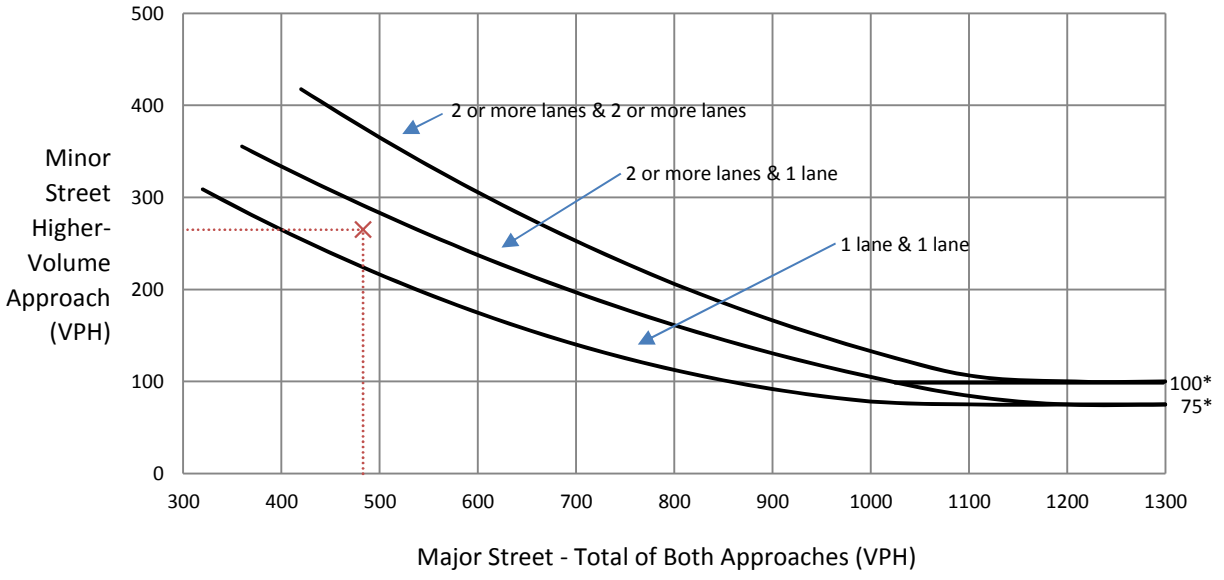


Traffic Signal Warrant Is NOT Satisfied

*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour Vehicular Volume (70% Factor)

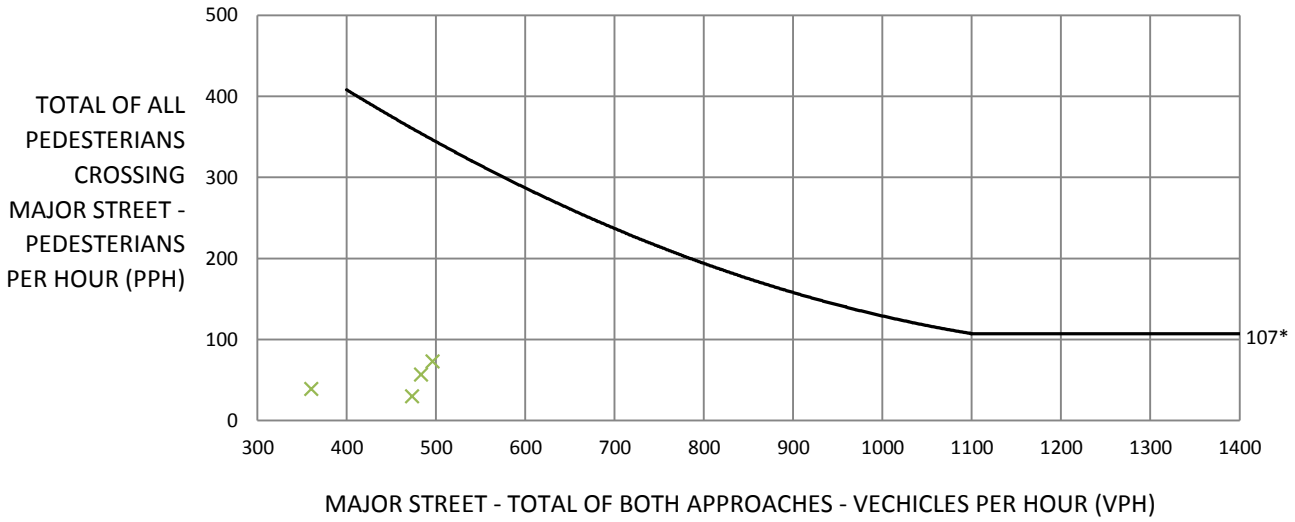
(Community less than 10,000 population or above 40 mph on the major street)



This figure is not applicable; see Figure 4C-3 above.

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

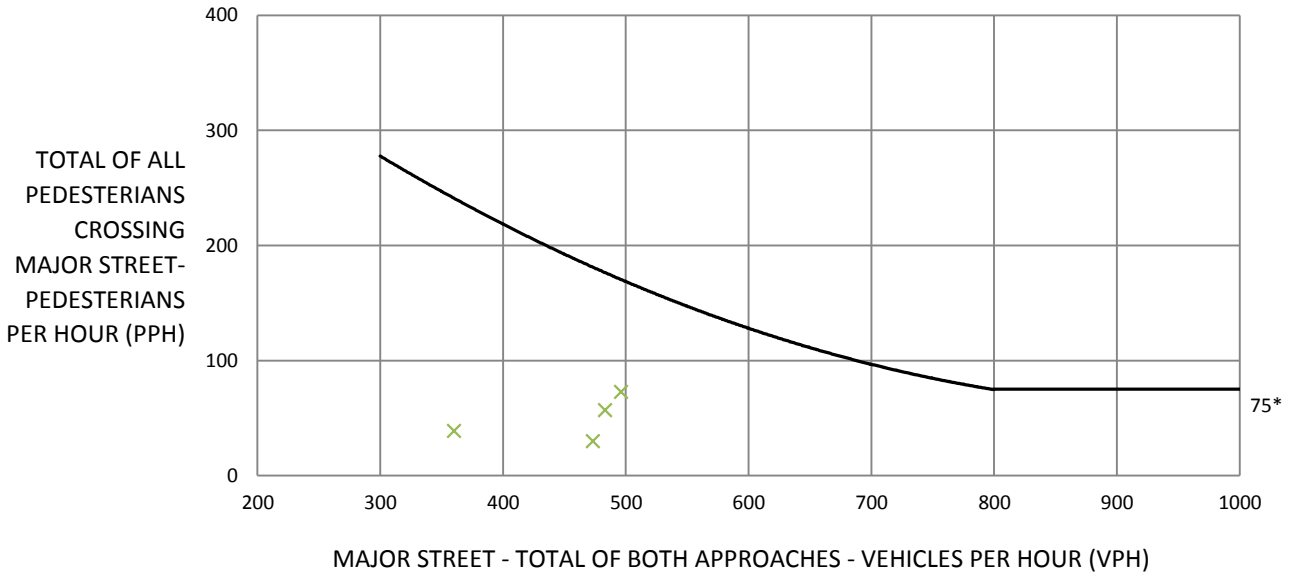
Figure 4C-5. Warrant 4, Pedestrian Four-Hour Volume



Traffic Signal Warrant Is NOT Satisfied

*Note: 107 pph applies as the lower threshold volume.

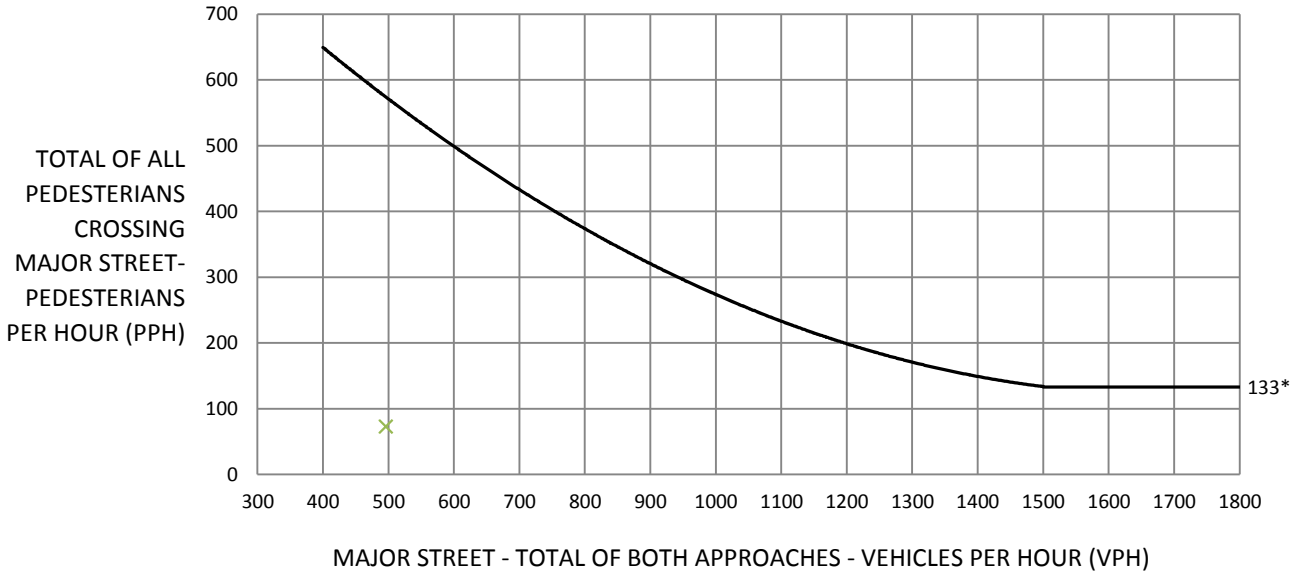
Figure 4C-6. Warrant 4, Pedestrian Four-Hour Volume (70% Factor)



This figure is not applicable; see Figure 4C-5 above.

*Note: 75 pph applies as the lower threshold volume.

Figure 4C-7. Warrant 4, Pedestrian Peak Hour



Traffic Signal Warrant Is NOT Satisfied

*Note: 133 pph applies as the lower threshold volume.

Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)



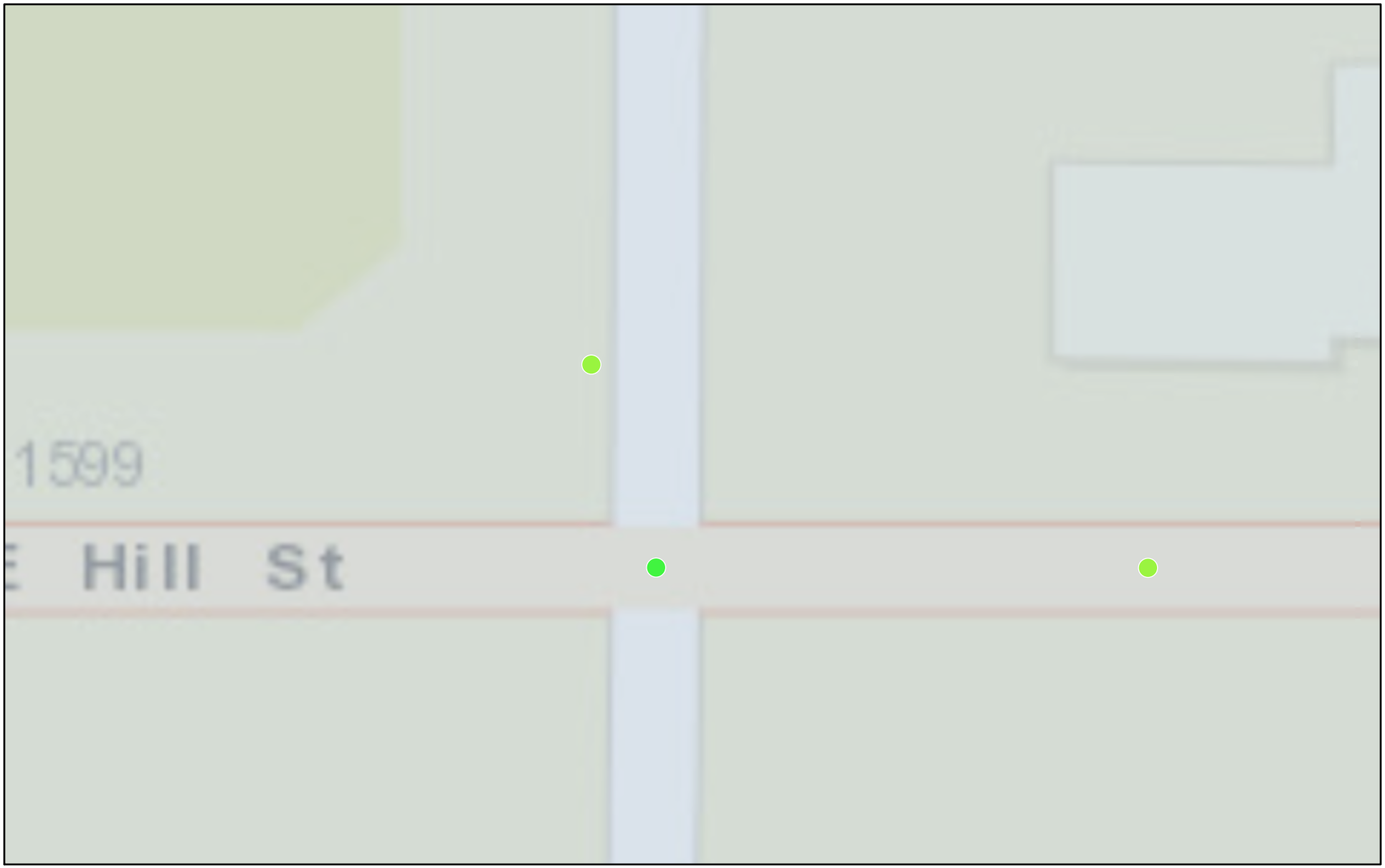
This figure is not applicable; see Figure 4C-7 above.

*Note: 93 pph applies as the lower threshold volume.

APPENDIX D

COLLISION RECORDS

SWITRS GIS Map: Los Angeles, Signal Hill 01/01/2013 - 12/31/2017



November 6, 2018

1:282

0 0 0 0.01 mi

0 0 0.01 0.01 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan,

Made by: SWITRS GIS Map at TIMS (https://tims.berkeley.edu), SafeTREC,
Copyright © 2018 UC Regents; all rights reserved.

Collision Details for: Case ID 7167369

Collision Information

County	Los Angeles
City	Signal Hill
Date & Time (M/D/Y HH:MM)	01/05/2016 08:40
Location (Intersection)	Hill & Walnut Av
Dist. & Dir. from Intersection	0.00 ft East
State Highway	No
Latidude & Longitude	33.79713011, -118.17202012

Type of Collision	D - Broadside	**Motor Vehicle Involved With**	C - Other Motor Vehicle
Collision Severity	4 - Injury (Complaint of Pain)	**Pedestiran Accident**	No
PCF Violation Category	09 - Automobile Right of Way	**Bicycle Accident**	No
Weather	C - Raining	**Motorcycle Accident**	No
Alcohol Involved	No	**Truck Accident**	No

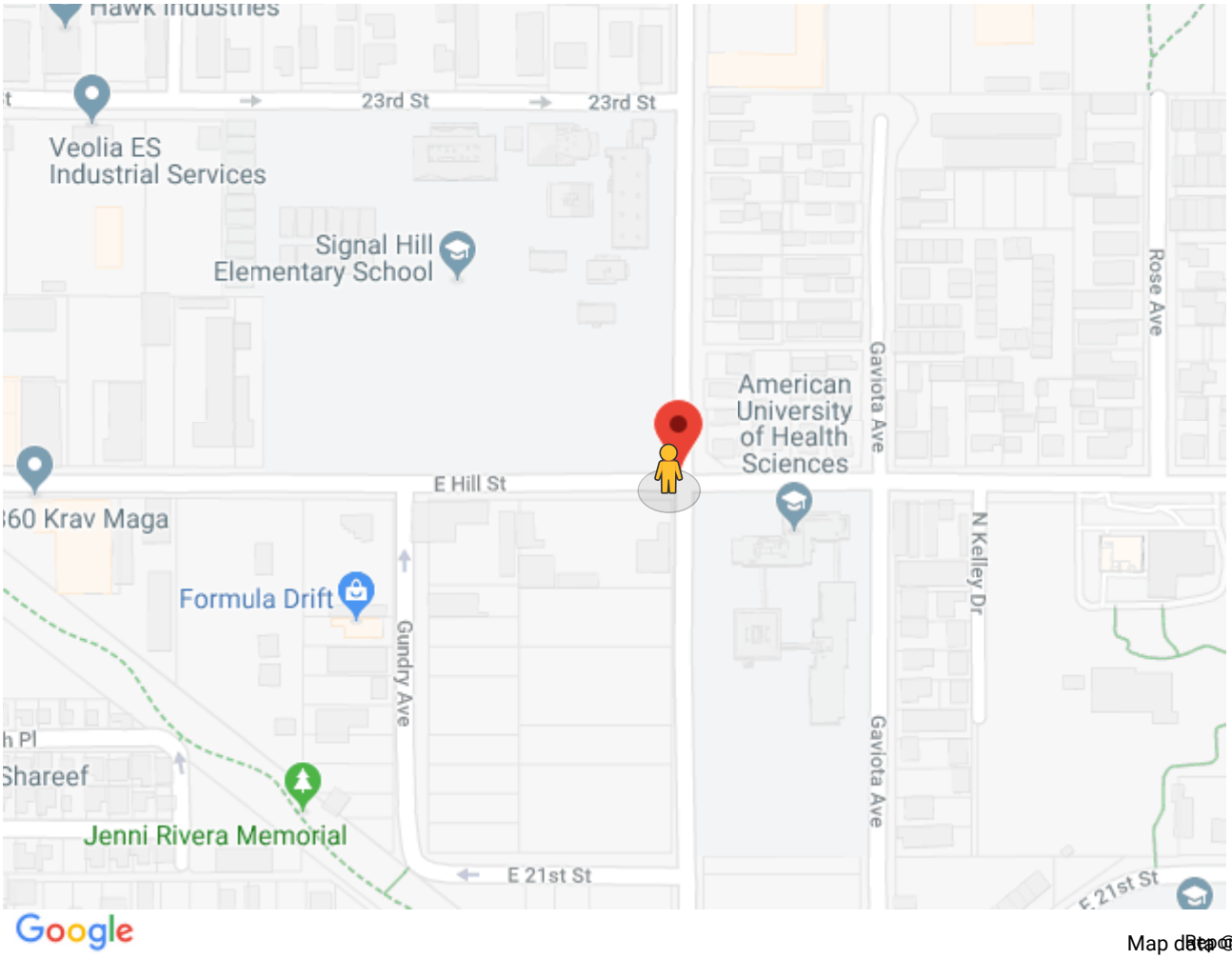
Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	East	B - Proceeding Straight
2	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	South	B - Proceeding Straight

Victims: 4

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	2 - Passenger	F - Female	11	0 - No Injury
2	2 - Passenger	F - Female	14	4 - Complaint of Pain
2	2 - Passenger	F - Female	12	0 - No Injury
2	2 - Passenger	M - Male	12	0 - No Injury

Map View



Map data ©2018 Google

Street View

1598 E Hill St
Signal Hill, California
View on Google Maps

Collision Details for: Case ID 6234458

Collision Information

County	Los Angeles
City	Signal Hill
Date & Time (M/D/Y HH:MM)	09/14/2013 17:52
Location (Intersection)	Walnut Av & Hill
Dist. & Dir. from Intersection	38.00 ft North
State Highway	No
Latidude & Longitude	33.797209, -118.1720504

Type of Collision	C - Rear End	**Motor Vehicle Involved With**	C - Other Motor Vehicle
Collision Severity	4 - Injury (Complaint of Pain)	**Pedestiran Accident**	No
PCF Violation Category	03 - Unsafe Speed	**Bicycle Accident**	No
Weather	A - Clear	**Motorcycle Accident**	No
Alcohol Involved	No	**Truck Accident**	No

Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	Yes	South	H - Slowing/Stopping
2	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	South	A - Stopped

Victims: 5

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
2	1 - Driver	F - Female	29	4 - Complaint of Pain
2	2 - Passenger	M - Male	47	0 - No Injury
2	2 - Passenger	M - Male	7	0 - No Injury
2	2 - Passenger	M - Male	2	0 - No Injury
2	2 - Passenger	F - Female	5	0 - No Injury

Map View



Street View

2201 N Walnut Ave
Signal Hill, California
View on Google Maps

Collision Details for: Case ID 8439941

Collision Information

County	Los Angeles
City	Signal Hill
Date & Time (M/D/Y HH:MM)	08/18/2017 11:54
Location (Intersection)	Hill & Walnut Av
Dist. & Dir. from Intersection	70.00 ft East
State Highway	No
Latidude & Longitude	33.79713, -118.17179007

Type of Collision	C - Rear End	**Motor Vehicle Involved With**	E - Parked Motor Vehicle
Collision Severity	4 - Injury (Complaint of Pain)	**Pedestiran Accident**	Yes
PCF Violation Category	18 - Other Than Driver (or Pedestrian)	**Bicycle Accident**	No
Weather	A - Clear	**Motorcycle Accident**	No
Alcohol Involved	No	**Truck Accident**	No

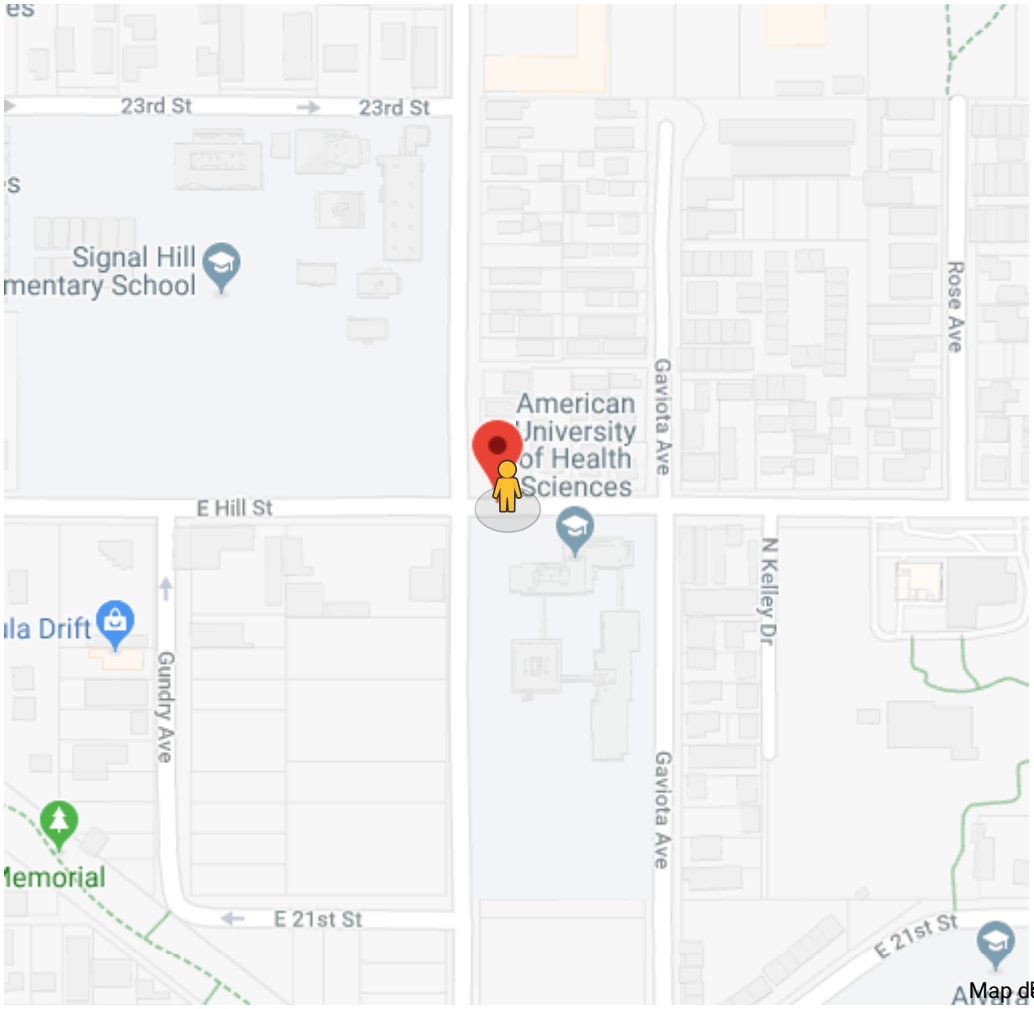
Parties: 3

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	East	B - Proceeding Straight
2	3 - Parked Vehicle	A - Passenger Car/Station Wagon	No	East	O - Parked
3	2 - Pedestrian	N - Pedestrian	No	East	- - Not Stated

Victims: 2

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	1 - Driver	F - Female	66	4 - Complaint of Pain
3	3 - Pedestrian	F - Female	25	4 - Complaint of Pain

Map View



Street View

1609 E Hill St
Signal Hill, California
View on Google Maps

January 1, 2018 - November 2, 2018

Case ID	Year	Date	Time	Primary Road	Secondary Road	Distance	Direction	Inter-section?	Severity	# Killed	# Injured	Primary Collision Factor	Type of Collision	MVIW
8575922	2018	20180303	2125	WALNUT AV	28TH	92	N	N	0	0	0	A	D	C
8575926	2018	20180305	2047	WALNUT AV	HILL	0		Y	0	0	0	D	D	C
8581623	2018	20180311	1643	WALNUT AV	SPRING	175	S	N	0	0	0	A	C	E
8609421	2018	20180415	1646	WALNUT AV	HILL	180	S	N	3	0	1	A	B	E
8644588	2018	20180611	1135	WALNUT AV	HILL ST	0		Y	3	0	1	A	D	C
8693361	2018	20180825	1530	WALNUT AV	WILLOW	97	S	N	3	0	1	A	D	C
8707351	2018	20180913	1545	WALNUT AV	WILLOW	40	S	N	4	0	1	A	C	C
8708906	2018	20180929	49	WALNUT AV	28TH ST	202	S	N	3	0	1	A	E	I

APPENDIX E

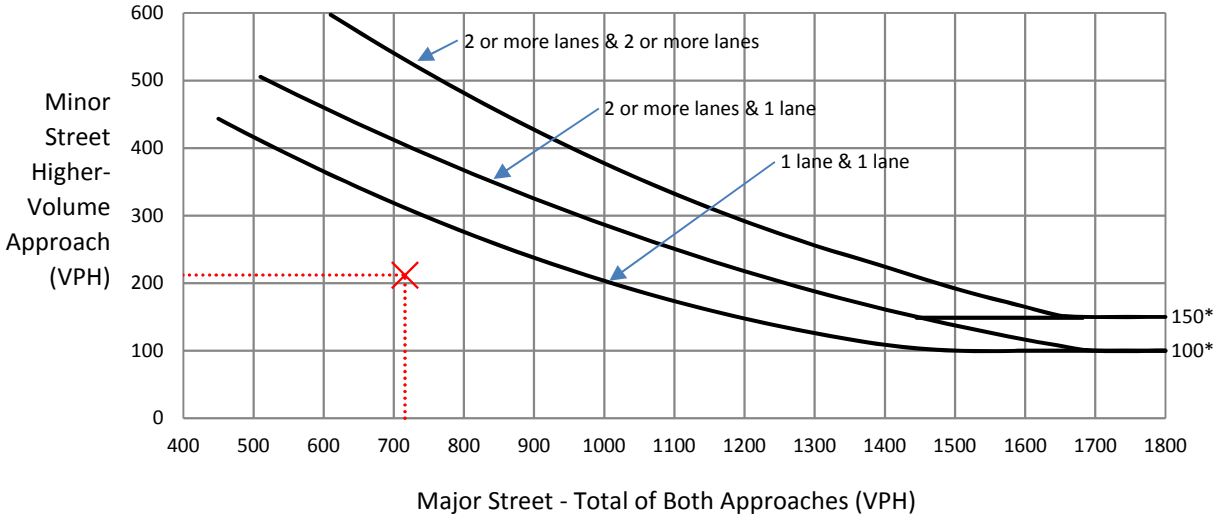
FUTURE CONDITIONS
PEAK HOUR TRAFFIC SIGNAL WARRANT WORKSHEETS

Figure E-1

Walnut Ave (NS) / Hill St (EW) - #10
General Plan Buildout With Project
AM Peak Hour

Major Street:	Walnut Ave	Volume:	716
Minor Street:	Hill St	Volume:	212

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

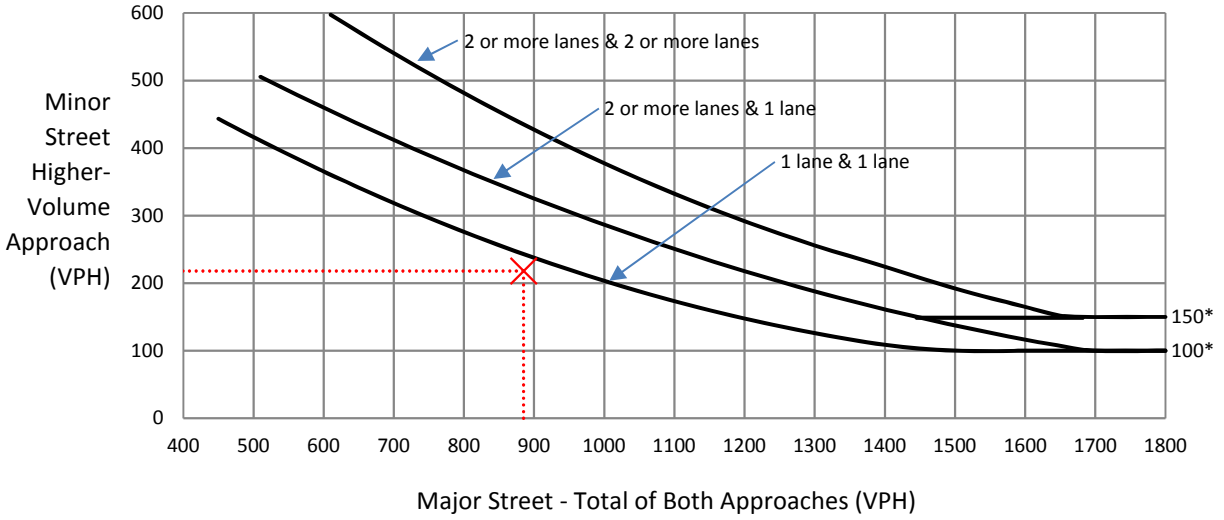
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure E-2

Walnut Ave (NS) / Hill St (EW) - #10
General Plan Buildout With Project
School PM Peak Hour

Major Street:	Walnut Ave	Volume:	885
Minor Street:	Hill St	Volume:	218

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

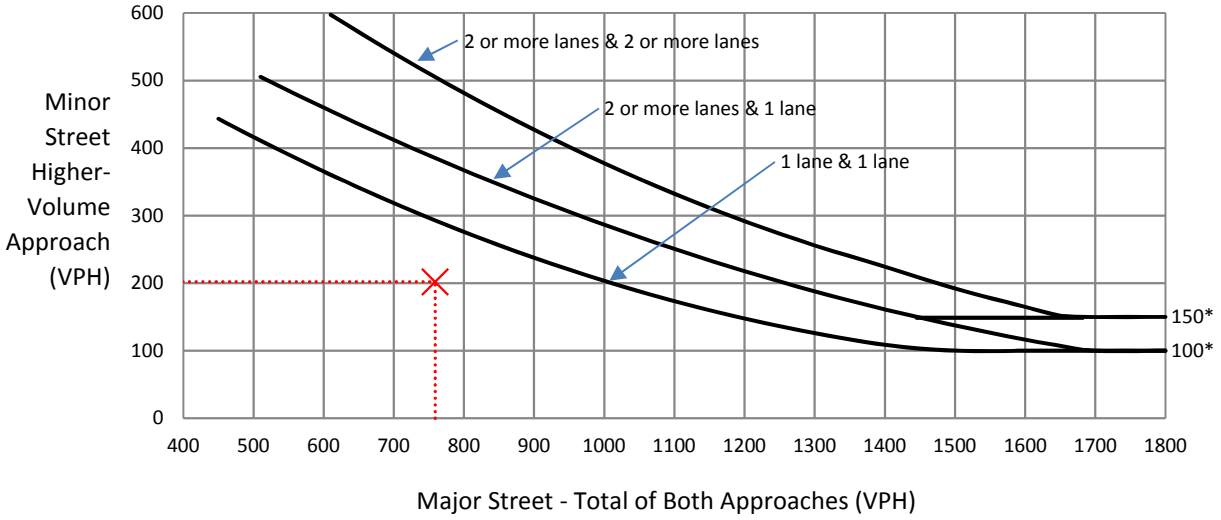
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure E-3

Walnut Ave (NS) / Hill St (EW) - #10
General Plan Buildout With Project
PM Peak Hour

Major Street:	Walnut Ave	Volume:	759
Minor Street:	Hill St	Volume:	202

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

KUNZMAN ASSOCIATES, INC.

SIGNAL HILL BUSINESS CENTER

SUPPLEMENTAL TRAFFIC ANALYSIS

March 12, 2018
Revised May 31, 2018

Traffic Engineering | Transportation Planning | Parking | Noise/Vibration | Expert Witness
Air Quality | Global Climate Change | Health Risk Assessment

May 31, 2018

Mr. Steven Christie, Development Manager
XEBEC REALTY PARTNERS
3010 Old Ranch Parkway, Suite 470
Seal Beach, CA 90740

Dear Mr. Christie:

INTRODUCTION

The firm of Kunzman Associates, Inc. is pleased to provide this supplemental traffic analysis for the proposed Signal Hill Business Center project in the City of Signal Hill. The purpose of this supplemental analysis is to assess potential traffic impacts associated with the proposed project during the afternoon school peak hour.

This traffic analysis supplements the Signal Hill Business Center Traffic Impact Analysis prepared by Kunzman Associates, Inc. (Revised May 31, 2018). The project site is generally bounded by Gundry Avenue to the west, Gundry Hill Apartments and American University of Health Sciences to the north, Gaviota Avenue to the east, and the Signal Hill City Limits and Alamitos Avenue to the south. The project site is currently vacant. The project site is proposed to consist of developing the project site with a business park consisting of nine buildings totaling 139,080 square feet plus 12,000 square feet of mezzanine, for a total of 151,080 square feet of gross floor area. Full access driveways are proposed at Gundry Avenue, Walnut Avenue, and Alamitos Avenue. The proposed project is anticipated to be constructed and fully operational by Year 2019.

Although this is a technical report, every effort has been made to write the report clearly and concisely. To assist the reader with those terms unique to transportation engineering, a glossary of terms is provided within Appendix A.

PROJECT TRIP GENERATION

Table 1 summarizes the afternoon peak hour project trip generation used in this analysis. As shown in Table 1, the proposed project is forecast to generate approximately 246 trips during the afternoon school peak hour. Figure 1 shows the project-generated afternoon peak hour intersection turning movement volumes based on the project trip distribution patterns identified in the Signal Hill Business Center Traffic Impact Analysis.

The project trip generation forecast is based upon regression equations obtained from the Institute of Transportation Engineers, Trip Generation Manual, 10th Edition, 2017. The Trip Generation Manual does not provide trip generation equations/rates for the afternoon school peak hour beginning at

approximately 2:15 PM to 2:30 PM. Therefore, the evening peak hour project trip generation calculated and used in the Signal Hill Business Center Traffic Impact Analysis was also used for this analysis. This is a conservative estimate since hourly distribution data contained in the Trip Generation Manual suggests that trips generated by light industrial and general office developments between 2:30 PM and 3:30 PM are approximately 10 to 35 percent lower than trips generated during the evening peak hour of adjacent street traffic.

AFTERNOON SCHOOL PEAK HOUR TRAFFIC VOLUMES

The morning school peak hour is estimated to occur between 7:00 AM and 8:00 AM. The morning school peak hour is accounted for in the Signal Hill Business Center Traffic Impact Analysis since the morning peak period was counted from 7:00 AM to 9:00 AM. The evening peak hour (commuter) generally outweighs school afternoon peak hour trips, especially as distance from the school increases. For this analysis, the study area is focused on the following intersections with yellow school crosswalk markings:

Orange Avenue (NS) at:
- Hill Street (EW) - #4
- Pacific Coast Highway (EW) - #5

Gundry Avenue (NS) at:
- Hill Street (EW) - #6

Walnut Avenue (NS) at:
- Hill Street (EW) - #10
- 20th Street/Alamitos Avenue (EW) - #11
- Pacific Coast Highway (EW) - #12

Cherry Avenue (NS) at:
- 21st Street (EW) - #18
- 20th Street (EW) - #19

Existing Traffic Volumes

Existing afternoon school peak hour traffic volumes are based upon afternoon peak period intersection turning movement counts obtained in February 2018 during typical weekday conditions. Based on review of bell schedules for schools in the project vicinity, the afternoon peak period was counted between 1:30 PM and 3:30 PM. The actual peak hour within the peak period is the four consecutive 15 minute periods with the highest total volume when all movements are added together. Thus, the weekday afternoon peak hour at one intersection may be 2:15 PM to 3:15 PM if those four consecutive 15 minute periods have the highest combined volume. Intersection turning movement count worksheets are provided in Appendix B.

Other Development Traffic Volumes

Similar to the project trip generation, the evening peak hour trip generation for other developments as calculated and used in the Signal Hill Business Center Traffic Impact Analysis was also used for this analysis. Consistent with the Signal Hill Business Center Traffic Impact Analysis, existing afternoon school peak hour traffic volumes were increased by a growth rate of one percent (1%) per year over two years for Opening Year (2020) conditions and over 20 years for General Plan Buildout conditions.

Existing and forecast afternoon school peak hour intersection turning movement volumes are illustrated on Figures 2 through 7.

TRESHOLDS OF SIGNIFICANCE

The significance of project traffic impacts is based on the thresholds identified in the Signal Hill Business Center Traffic Impact Analysis.

City of Signal Hill/City of Long Beach. For signalized study intersections within City of Signal Hill or City of Long jurisdiction, a project traffic impact is considered significant if:

- The addition of project-generated trips is forecast to cause an intersection to deteriorate from acceptable Level of Service (D or better) to unacceptable Level of Service (E or F); or,
- The addition of project-generated trips is forecast to cause an increase in volume-to-capacity of 0.02 or greater when the intersection is operating at unacceptable Level of Service (E or F) in the baseline condition.

California Department of Transportation. Based on the California Department of Transportation established performance standards, a potentially significant traffic impact is defined to occur if the addition of project generated trips is forecast to cause the performance of a State Highway study intersection to change from acceptable operation (Level of Service D or better) to deficient operation (Level of Service E or F).

It should be noted that many jurisdictions, including the Cities of Signal Hill and Long Beach, do not have established significant impact thresholds for unsignalized intersections. For this analysis, a project impact at an unsignalized intersection is considered significant if the addition of project-generated trips is forecast to cause or worsen Level of Service E or F and installation of a traffic signal is warranted.

TRAFFIC IMPACT ASSESSMENT

Existing Plus Project

Tables 2 and 3 show Intersection Capacity Utilization/delay and Levels of Service at the study intersections for Existing and Existing Plus Project traffic conditions. As shown in Tables 2 and 3, the

study intersections operate at acceptable Levels of Service (D or better) for Existing and Existing Plus Project traffic conditions during the afternoon school peak hour.

Table 4 evaluates the project impact at the study intersections for Existing Plus Project traffic conditions. As shown in Table 4, the proposed project is forecast to result in no significant traffic impacts at the study intersections for Existing Plus Project traffic conditions.

Opening Year (2020)

Tables 5 and 6 show Intersection Capacity Utilization/delay and Levels of Service at the study intersections for Opening Year (2020) Without and With Project traffic conditions. As shown in Tables 5 and 6, the study intersections are projected to operate at acceptable Levels of Service (D or better) for Opening Year (2020) Without and With Project traffic conditions during the afternoon school peak hour.

Table 7 evaluates the project impact at the study intersections for Opening Year (2020) With Project traffic conditions. As shown in Table 7, the proposed project is forecast to result in no significant traffic impacts at the study intersections for Opening Year (2020) With Project traffic conditions.

General Plan Buildout (Year 2040)

Tables 8 and 9 show Intersection Capacity Utilization/delay and Levels of Service at the study intersections for General Plan Buildout (Year 2040) Without and With Project traffic conditions. As shown in Tables 8 and 9, the study intersections are projected to operate at acceptable Levels of Service (D or better) for General Plan Buildout (Year 2040) Without and With Project traffic conditions during the afternoon school peak hour, except for the intersection of Walnut Avenue/Hill Street for General Plan Buildout (Year 2040) With Project traffic conditions.

Table 10 evaluates the project impact at the study intersections for General Plan Buildout (Year 2040) With Project traffic conditions. As shown in Table 10, the proposed project is forecast to result in no significant traffic impacts at the study intersections for General Plan Buildout (Year 2040) With Project traffic conditions.

RECOMMENDATIONS

As shown in Table 10, the project impact is forecast to be less than significant at the study intersection of Walnut Avenue/Hill Street because the intersection volumes do not satisfy the peak hour volume traffic signal warrant in accordance with the California Manual on Uniform Traffic Control Devices (2014) ["CA MUTCD"]. However, since the addition of project-generated trips is forecast to cause the Level of Service to degrade from acceptable (D or better) to unacceptable (Level of Service E or F), the following mitigation measure is recommended:

Walnut Avenue/Hill Street - #10

- Extend the no parking restriction on the northbound approach to 100 feet south of the intersection. This will result in the loss of approximately two on-street parking spaces, but will allow for a de facto right turn lane.

With implementation of the proposed mitigation measure at Walnut Avenue/Hill Street, the study intersections are forecast to operate at Level of Service D or better during the afternoon school peak hour.

Appendix D contains the peak hour traffic signal warrant worksheet for the intersection of Walnut Avenue/Hill Street.

CONCLUSIONS

It has been a pleasure to service your needs on this project. Should you have any questions or if we can be of further assistance, please do not hesitate to call at (714) 973-8383.

Sincerely,

KUNZMAN ASSOCIATES, INC.





Giancarlo Ganddini, TE, PTP
Manager of Traffic Engineering

JN 7311

Table 1

Project Trip Generation

Land Use	Source[1]	Setting[2]	Trip Generation Equations[3]	Directional Distribution	
				Inbound	Outbound
Business Park School PM Peak Hour	ITE 770	GU/S	Ln(T) = 0.90 Ln(X) + 0.85	26%	74%

Land Use/Time Period	Quantity	Units[4]	Vehicle Trips Generated		
			Total	Inbound	Outbound
Business Park	151.080	TSF			
School PM Peak Hour			214	56	158
Cars (85%)			182	48	134
Trucks (15%)			32	8	24

Time Period	PCE Factor	PCE Trips Generated[5]		
		Total	Inbound	Outbound
School PM Peak Hour				
Cars	1.0	182	48	134
Trucks	2.0	64	16	48
Total		**246**	**64**	**182**

[1] ITE = Institute of Transportation Engineers, Trip Generation Manual, 10th Edition, 2017; ### = Land Use Code

[2] GU/S = General Urban/Suburban

[3] T = Trips; X = Thousand Square Feet

[4] TSF = Thousand Square Feet

[5] PCE = Passenger Car Equivalent

Table 2

Existing Intersection Capacity Utilization/Delay and Levels of Service

Intersection	Traffic Control[1]	Intersection Approach Lanes[2]												School PM Peak Hour V/C [Delay]-LOS[3]
		Northbound			Southbound			Eastbound			Westbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Orange Avenue (NS) at:														
Hill Street (EW) - #4	TS	1	0.5	0.5	1	0.5	0.5	0.5	0.5	1	0.5	0.5	d	0.656-B
Pacific Coast Highway (EW) - #5	TS	1	2	1>	1	2	1	1	2.5	0.5	1	2.5	0.5	[20.4]-C
Gundry Avenue (NS) at:														
Hill Street (EW) - #6	CSS	0.5	-	0.5	-	-	-	-	0.5	0.5	0.5	0.5	-	[13.2]-B
Walnut Avenue (NS) at:														
Hill Street (EW) - #10	AWS	-	<1>	-	0.5	0.5	1	-	<1>	-	-	<1>	-	[14.8]-B
20th Street/Alamitos Avenue (EW) - #11	TS	1	0.5	0.5	1	0.5	0.5	-	<1>	-	-	<1>	-	0.564-A
Pacific Coast Highway (EW) - #12	TS	-	<1>	-	-	<1>	-	1	2.5	0.5	1	2.5	0.5	[9.9]-A
Cherry Avenue (NS) at:														
21st Street (EW) - #18	TS	1	2	d	1	2	1	0.5	0.5	d	1	0.5	0.5	0.544-A
20th Street (EW) - #19	TS	1	1.5	0.5	1	1.5	0.5	1	0.5	0.5	-	<1>	-	0.475-A

[1] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

[2] L = Left; T = Through; R = Right; d = De Facto Right Turn Lane; <1> = Shared Left/Through/Right Lane; > = Right Turn Overlap

[3] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; [Delay]-LOS is reported for intersections under California Department of Transportation jurisdiction and intersections with stop control. Per the Highway Capacity Manual, overall average intersection delay and LOS are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, Level of Service is based on average delay of the worst individual lane (or movements sharing a lane).

Table 3

Existing Plus Project Intersection Capacity Utilization/Delay and Levels of Service

Intersection	Traffic Control[1]	Intersection Approach Lanes[2]												School PM Peak Hour V/C [Delay]-LOS[3]
		Northbound			Southbound			Eastbound			Westbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Orange Avenue (NS) at:														
Hill Street (EW) - #4	TS	1	0.5	0.5	1	0.5	0.5	0.5	0.5	1	0.5	0.5	d	0.664-B
Pacific Coast Highway (EW) - #5	TS	1	2	1>	1	2	1	1	2.5	0.5	1	2.5	0.5	[20.5]-C
Gundry Avenue (NS) at:														
Hill Street (EW) - #6	CSS	0.5	-	0.5	-	-	-	-	0.5	0.5	0.5	0.5	-	[14.9]-B
Walnut Avenue (NS) at:														
Hill Street (EW) - #10	AWS	-	<1>	-	0.5	0.5	1	-	<1>	-	-	<1>	-	[19.6]-C
20th Street/Alamitos Avenue (EW) - #11	TS	1	0.5	0.5	1	0.5	0.5	-	<1>	-	-	<1>	-	0.578-A
Pacific Coast Highway (EW) - #12	TS	-	<1>	-	-	<1>	-	1	2.5	0.5	1	2.5	0.5	[11.6]-B
Cherry Avenue (NS) at:														
21st Street (EW) - #18	TS	1	2	d	1	2	1	0.5	0.5	d	1	0.5	0.5	0.552-A
20th Street (EW) - #19	TS	1	1.5	0.5	1	1.5	0.5	1	0.5	0.5	-	<1>	-	0.475-A

[1] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

[2] L = Left; T = Through; R = Right; d = De Facto Right Turn Lane; <1> = Shared Left/Through/Right Lane; > = Right Turn Overlap

[3] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; [Delay]-LOS is reported for intersections under California Department of Transportation jurisdiction and intersections with stop control. Per the Highway Capacity Manual, overall average intersection delay and LOS are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, Level of Service is based on average delay of the worst individual lane (or movements sharing a lane).

Table 4

Existing Plus Project Significant Impact Evaluation

Signalized Intersections				
	School PM Peak Hour V/C [Delay]-LOS[1]			
Intersection	Without Project	With Project	Change in V/C or Delay	Significant Impact?
Orange Avenue (NS) at:				
Hill Street (EW) - #4	0.656-B	0.664-B	+0.008	No
Pacific Coast Highway (EW) - #5	[20.4]-C	[20.5]-C	+0.1	No
Walnut Avenue (NS) at:				
20th Street/Alamitos Avenue (EW) - #11	0.564-A	0.578-A	+0.014	No
Pacific Coast Highway (EW) - #12	[9.9]-A	[11.6]-B	+1.7	No
Cherry Avenue (NS) at:				
21st Street (EW) - #18	0.544-A	0.552-A	+0.008	No
20th Street (EW) - #19	0.475-A	0.475-A	0.000	No

Unsignalized Intersections					
	School PM Peak Hour Delay-LOS				
Intersection	Without Project	With Project	Acceptable LOS?	Traffic Signal Warranted?	Significant Impact?
Gundry Avenue (NS) at:					
Hill Street (EW) - #6	13.2-B	14.9-B	Yes	-	No
Walnut Avenue (NS) at:					
Hill Street (EW) - #10	14.8-B	19.6-C	Yes	-	No

[1] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; see Tables 1 and 3.

Table 5

Opening Year (2020) Without Project Intersection Capacity Utilization/Delay and Levels of Service

Intersection	Traffic Control[1]	Intersection Approach Lanes[2]												School PM Peak Hour V/C [Delay]-LOS[3]
		Northbound			Southbound			Eastbound			Westbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Orange Avenue (NS) at:														
Hill Street (EW) - #4	TS	1	0.5	0.5	1	0.5	0.5	0.5	0.5	1	0.5	0.5	d	0.690-B
Pacific Coast Highway (EW) - #5	TS	1	2	1>	1	2	1	1	2.5	0.5	1	2.5	0.5	[21.0]-C
Gundry Avenue (NS) at:														
Hill Street (EW) - #6	CSS	0.5	-	0.5	-	-	-	-	0.5	0.5	0.5	0.5	-	[13.6]-B
Walnut Avenue (NS) at:														
Hill Street (EW) - #10	AWS	-	<1>	-	0.5	0.5	1	-	<1>	-	-	<1>	-	[15.9]-C
20th Street/Alamitos Avenue (EW) - #11	TS	1	0.5	0.5	1	0.5	0.5	-	<1>	-	-	<1>	-	0.576-A
Pacific Coast Highway (EW) - #12	TS	-	<1>	-	-	<1>	-	1	2.5	0.5	1	2.5	0.5	[10.3]-B
Cherry Avenue (NS) at:														
21st Street (EW) - #18	TS	1	2	d	1	2	1	0.5	0.5	d	1	0.5	0.5	0.566-A
20th Street (EW) - #19	TS	1	1.5	0.5	1	1.5	0.5	1	0.5	0.5	-	<1>	-	0.489-A

[1] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

[2] L = Left; T = Through; R = Right; d = De Facto Right Turn Lane; <1> = Shared Left/Through/Right Lane; > = Right Turn Overlap

[3] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; [Delay]-LOS is reported for intersections under California Department of Transportation jurisdiction and intersections with stop control. Per the Highway Capacity Manual, overall average intersection delay and LOS are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, Level of Service is based on average delay of the worst individual lane (or movements sharing a lane).

Table 6

Opening Year (2020) With Project Intersection Capacity Utilization/Delay and Levels of Service

Intersection	Traffic Control[1]	Intersection Approach Lanes[2]												School PM Peak Hour V/C [Delay]-LOS[3]
		Northbound			Southbound			Eastbound			Westbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Orange Avenue (NS) at:														
Hill Street (EW) - #4	TS	1	0.5	0.5	1	0.5	0.5	0.5	0.5	1	0.5	0.5	d	0.703-C
Pacific Coast Highway (EW) - #5	TS	1	2	1>	1	2	1	1	2.5	0.5	1	2.5	0.5	[21.1]-C
Gundry Avenue (NS) at:														
Hill Street (EW) - #6	CSS	0.5	-	0.5	-	-	-	-	0.5	0.5	0.5	0.5	-	[15.5]-C
Walnut Avenue (NS) at:														
Hill Street (EW) - #10	AWS	-	<1>	-	0.5	0.5	1	-	<1>	-	-	<1>	-	[22.2]-C
20th Street/Alamitos Avenue (EW) - #11	TS	1	0.5	0.5	1	0.5	0.5	-	<1>	-	-	<1>	-	0.591-A
Pacific Coast Highway (EW) - #12	TS	-	<1>	-	-	<1>	-	1	2.5	0.5	1	2.5	0.5	[12.1]-B
Cherry Avenue (NS) at:														
21st Street (EW) - #18	TS	1	2	d	1	2	1	0.5	0.5	d	1	0.5	0.5	0.573-A
20th Street (EW) - #19	TS	1	1.5	0.5	1	1.5	0.5	1	0.5	0.5	-	<1>	-	0.489-A

[1] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

[2] L = Left; T = Through; R = Right; d = De Facto Right Turn Lane; <1> = Shared Left/Through/Right Lane; > = Right Turn Overlap

[3] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; [Delay]-LOS is reported for intersections under California Department of Transportation jurisdiction and intersections with stop control. Per the Highway Capacity Manual, overall average intersection delay and LOS are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, Level of Service is based on average delay of the worst individual lane (or movements sharing a lane).

Table 7

Opening Year (2020) Significant Impact Evaluation

Signalized Intersections				
	School PM Peak Hour V/C [Delay]-LOS[1]			
Intersection	Without Project	With Project	Change in V/C or Delay	Significant Impact?
Orange Avenue (NS) at:				
Hill Street (EW) - #4	0.690-B	0.703-C	+0.013	No
Pacific Coast Highway (EW) - #5	[21.0]-C	[21.1]-C	+0.1	No
Walnut Avenue (NS) at:				
20th Street/Alamitos Avenue (EW) - #11	0.576-A	0.591-A	+0.015	No
Pacific Coast Highway (EW) - #12	[10.3]-B	[12.1]-B	+1.8	No
Cherry Avenue (NS) at:				
21st Street (EW) - #18	0.566-A	0.573-A	+0.007	No
20th Street (EW) - #19	0.489-A	0.489-A	0.000	No

Unsignalized Intersections					
	School PM Peak Hour Delay-LOS				
Intersection	Without Project	With Project	Acceptable LOS?	Traffic Signal Warranted?	Significant Impact?
Gundry Avenue (NS) at:					
Hill Street (EW) - #6	13.6-B	15.5-C	Yes	-	No
Walnut Avenue (NS) at:					
Hill Street (EW) - #10	15.9-C	22.2-C	Yes	-	No

[1] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; see Tables 5 and 6.

Table 8

General Plan Buildout (Year 2040) Without Project
Intersection Capacity Utilization/Delay and Levels of Service

Intersection	Traffic Control[1]	Intersection Approach Lanes[2]												School PM Peak Hour V/C [Delay]-LOS[3]
		Northbound			Southbound			Eastbound			Westbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Orange Avenue (NS) at:														
Hill Street (EW) - #4	TS	1	0.5	0.5	1	0.5	0.5	0.5	0.5	1	0.5	0.5	d	0.802-D
Pacific Coast Highway (EW) - #5	TS	1	2	1>	1	2	1	1	2.5	0.5	1	2.5	0.5	[24.0]-C
Gundry Avenue (NS) at:														
Hill Street (EW) - #6	CSS	0.5	-	0.5	-	-	-	-	0.5	0.5	0.5	0.5	-	[15.6]-C
Walnut Avenue (NS) at:														
Hill Street (EW) - #10	AWS	-	<1>	-	0.5	0.5	1	-	<1>	-	-	<1>	-	[29.1]-D
20th Street/Alamitos Avenue (EW) - #11	TS	1	0.5	0.5	1	0.5	0.5	-	<1>	-	-	<1>	-	0.648-B
Pacific Coast Highway (EW) - #12	TS	-	<1>	-	-	<1>	-	1	2.5	0.5	1	2.5	0.5	[12.7]-B
Cherry Avenue (NS) at:														
21st Street (EW) - #18	TS	1	2	d	1	2	1	0.5	0.5	d	1	0.5	0.5	0.655-B
20th Street (EW) - #19	TS	1	1.5	0.5	1	1.5	0.5	1	0.5	0.5	-	<1>	-	0.564-A

[1] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

[2] L = Left; T = Through; R = Right; d = De Facto Right Turn Lane; <1> = Shared Left/Through/Right Lane; > = Right Turn Overlap

[3] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; [Delay]-LOS is reported for intersections under California Department of Transportation jurisdiction and intersections with stop control. Per the Highway Capacity Manual, overall average intersection delay and LOS are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, Level of Service is based on average delay of the worst individual lane (or movements sharing a lane).

Table 9

General Plan Buildout (Year 2040) With Project
Intersection Capacity Utilization/Delay and Levels of Service

Intersection	Traffic Control[1]	Intersection Approach Lanes[2]												School PM Peak Hour V/C [Delay]-LOS[3]
		Northbound			Southbound			Eastbound			Westbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Orange Avenue (NS) at:														
Hill Street (EW) - #4	TS	1	0.5	0.5	1	0.5	0.5	0.5	0.5	1	0.5	0.5	d	0.813-D
Pacific Coast Highway (EW) - #5	TS	1	2	1>	1	2	1	1	2.5	0.5	1	2.5	0.5	[24.2]-C
Gundry Avenue (NS) at:														
Hill Street (EW) - #6	CSS	0.5	-	0.5	-	-	-	-	0.5	0.5	0.5	0.5	-	[18.3]-C
Walnut Avenue (NS) at:														
Hill Street (EW) - #10	AWS	-	<1>	-	0.5	0.5	1	-	<1>	-	-	<1>	-	[48.6]-E
20th Street/Alamitos Avenue (EW) - #11	TS	1	0.5	0.5	1	0.5	0.5	-	<1>	-	-	<1>	-	0.663-B
Pacific Coast Highway (EW) - #12	TS	-	<1>	-	-	<1>	-	1	2.5	0.5	1	2.5	0.5	[15.2]-B
Cherry Avenue (NS) at:														
21st Street (EW) - #18	TS	1	2	d	1	2	1	0.5	0.5	d	1	0.5	0.5	0.662-B
20th Street (EW) - #19	TS	1	1.5	0.5	1	1.5	0.5	1	0.5	0.5	-	<1>	-	0.564-A

[1] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

[2] L = Left; T = Through; R = Right; d = De Facto Right Turn Lane; <1> = Shared Left/Through/Right Lane; > = Right Turn Overlap

[3] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; [Delay]-LOS is reported for intersections under California Department of Transportation jurisdiction and intersections with stop control. Per the Highway Capacity Manual, overall average intersection delay and LOS are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, Level of Service is based on average delay of the worst individual lane (or movements sharing a lane).

Table 10

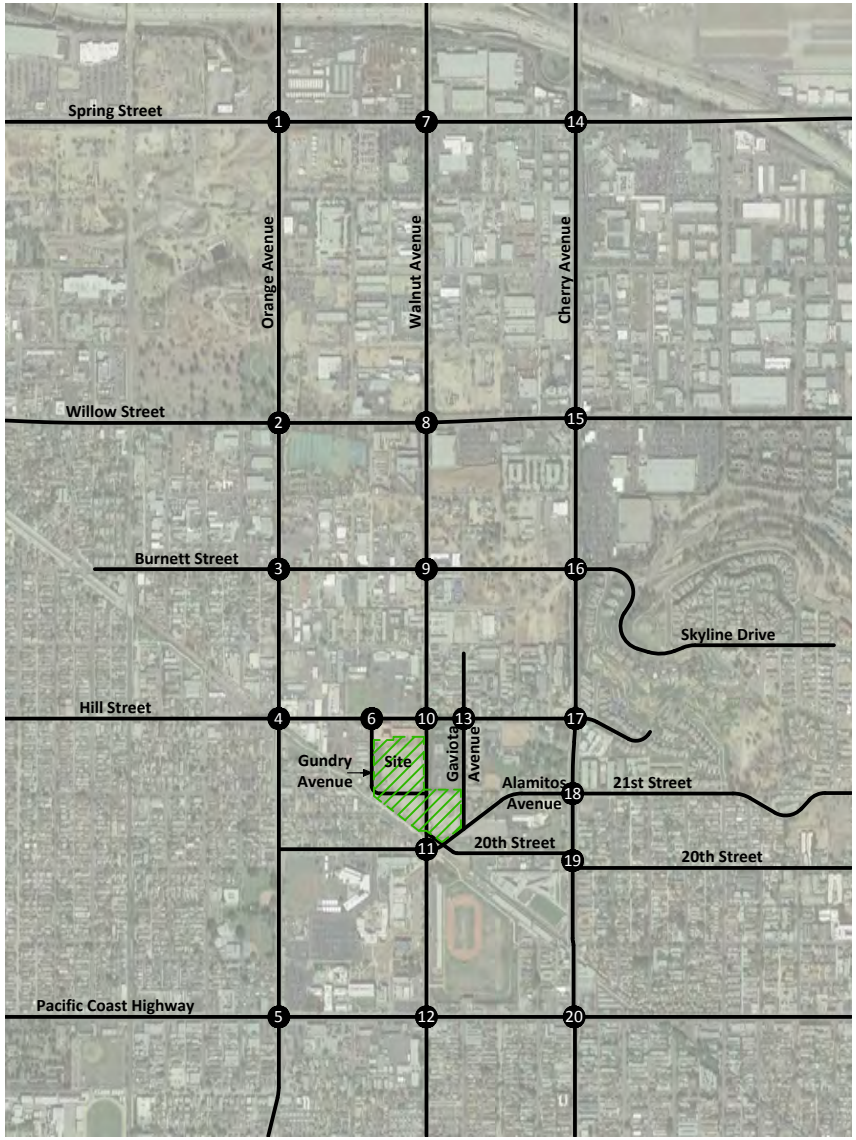
General Plan Buildout (Year 2040) Significant Impact Evaluation

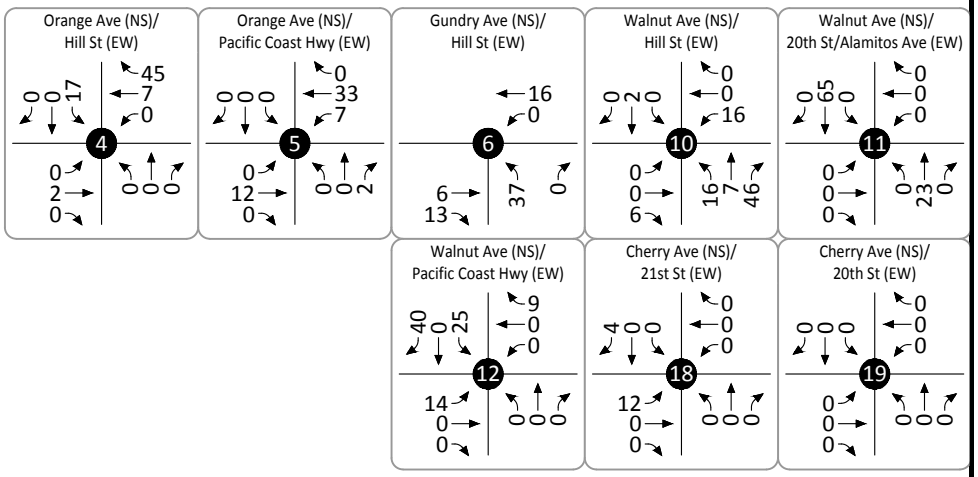
Signalized Intersections				
	School PM Peak Hour V/C [Delay]-LOS[1]			
Intersection	Without Project	With Project	Change in V/C or Delay	Significant Impact?
Orange Avenue (NS) at:				
Hill Street (EW) - #4	0.802-D	0.813-D	+0.011	No
Pacific Coast Highway (EW) - #5	[24.0]-C	[24.2]-C	+0.2	No
Walnut Avenue (NS) at:				
20th Street/Alamitos Avenue (EW) - #11	0.648-B	0.663-B	+0.015	No
Pacific Coast Highway (EW) - #12	[12.7]-B	[15.2]-B	+2.5	No
Cherry Avenue (NS) at:				
21st Street (EW) - #18	0.655-B	0.662-B	+0.007	No
20th Street (EW) - #19	0.564-A	0.564-A	0.000	No

Unsignalized Intersections					
	School PM Peak Hour Delay-LOS				
Intersection	Without Project	With Project	Acceptable LOS?	Traffic Signal Warranted?	Significant Impact?
Gundry Avenue (NS) at:					
Hill Street (EW) - #6	15.6-C	18.3-C	Yes	-	No
Walnut Avenue (NS) at:					
Hill Street (EW) - #10	29.1-D	48.6-E	No	No	No

[1] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; see Tables 8 and 9.

Figure 1
Project
Afternoon School Peak Hour Intersection Turning Movement Volumes





Legend

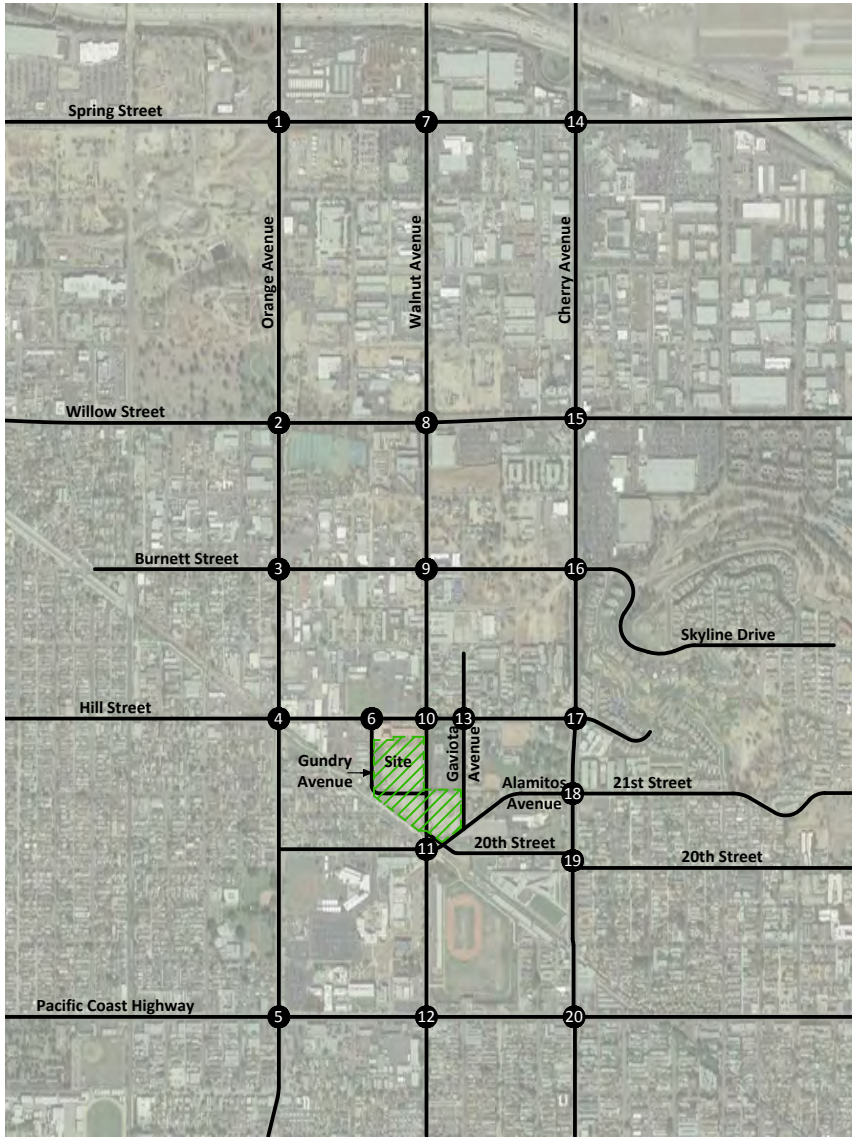
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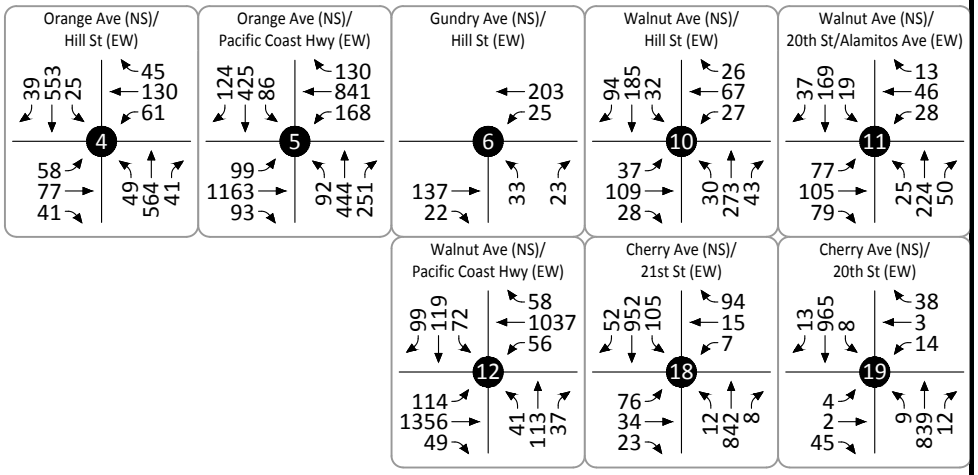
KUNZMAN ASSOCIATES, INC.

OVER 40 YEARS OF EXCELLENT SERVICE

JN 7311

Figure 2
Existing
Afternoon School Peak Hour Intersection Turning Movement Volumes

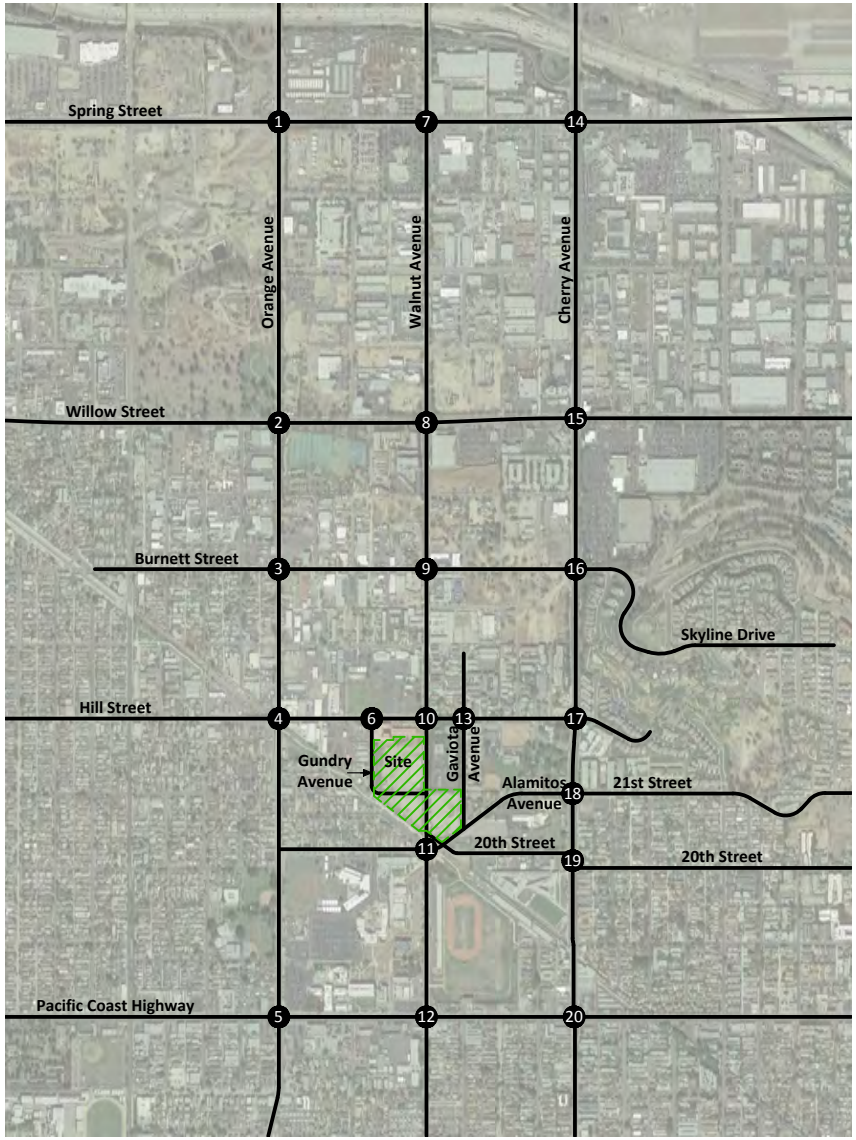


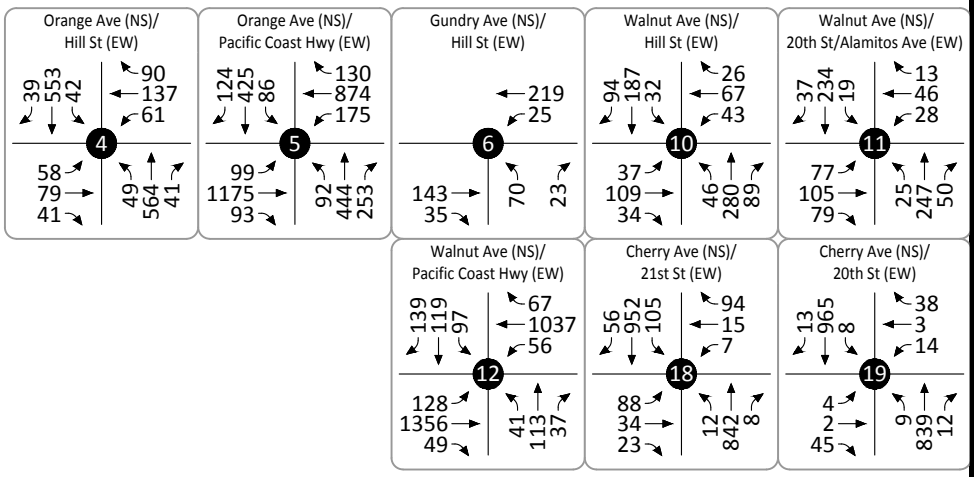


Legend

1 = Intersection Reference Number

Figure 3
Existing Plus Project
Afternoon School Peak Hour Intersection Turning Movement Volumes





Legend

1 = Intersection Reference Number

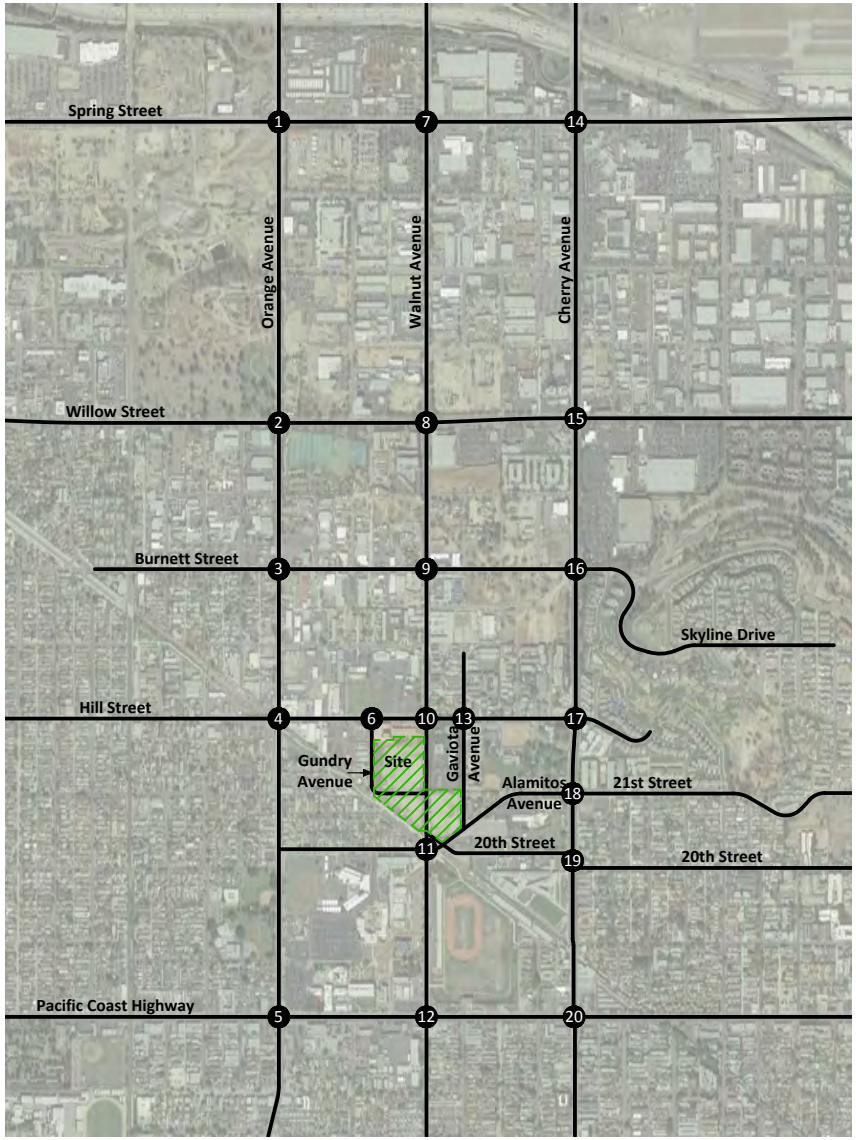
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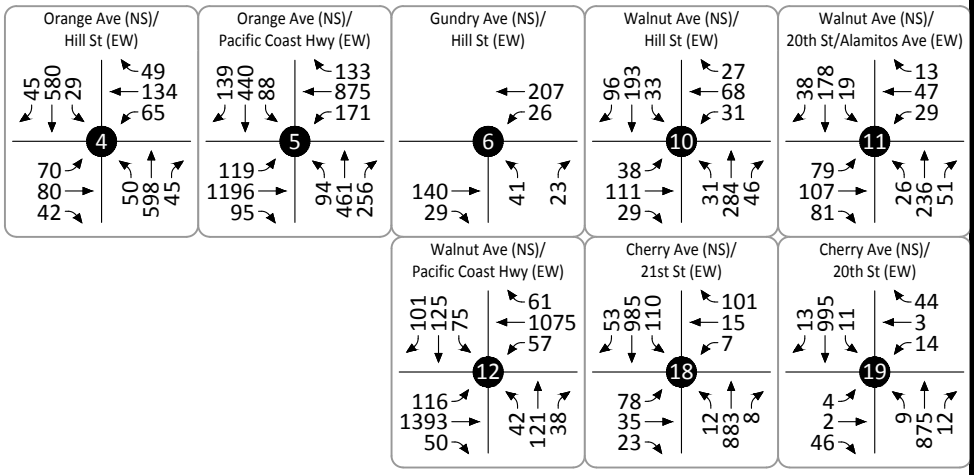
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Figure 4
Opening Year (2020) Without Project
Afternoon School Peak Hour Intersection Turning Movement Volumes





Legend

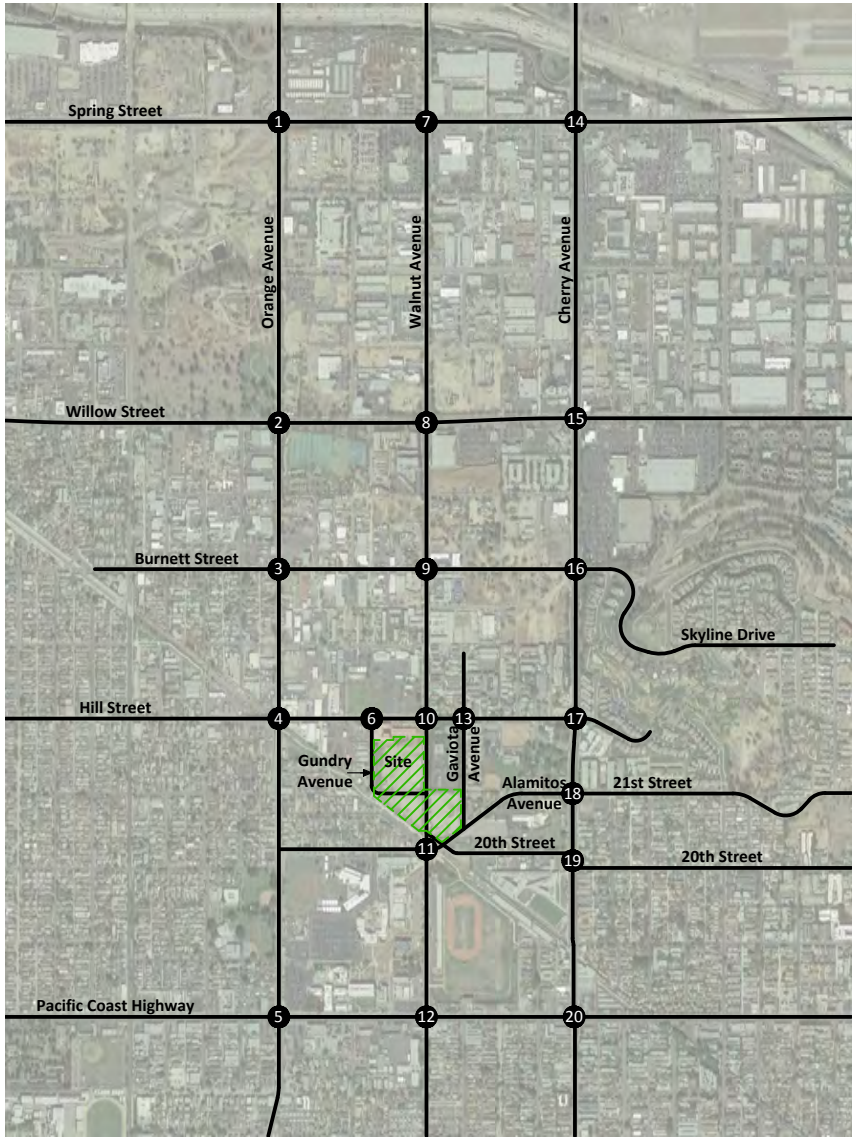
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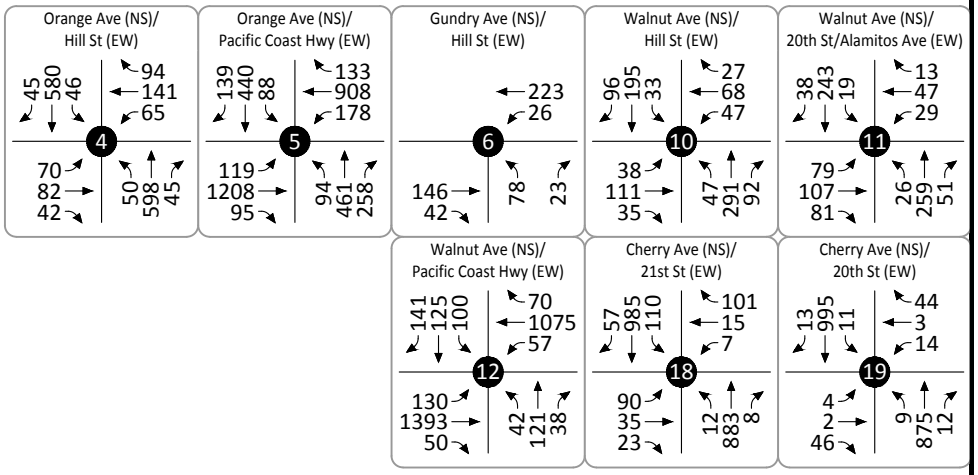
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Figure 5
Opening Year (2020) With Project
Afternoon School Peak Hour Intersection Turning Movement Volumes





Legend

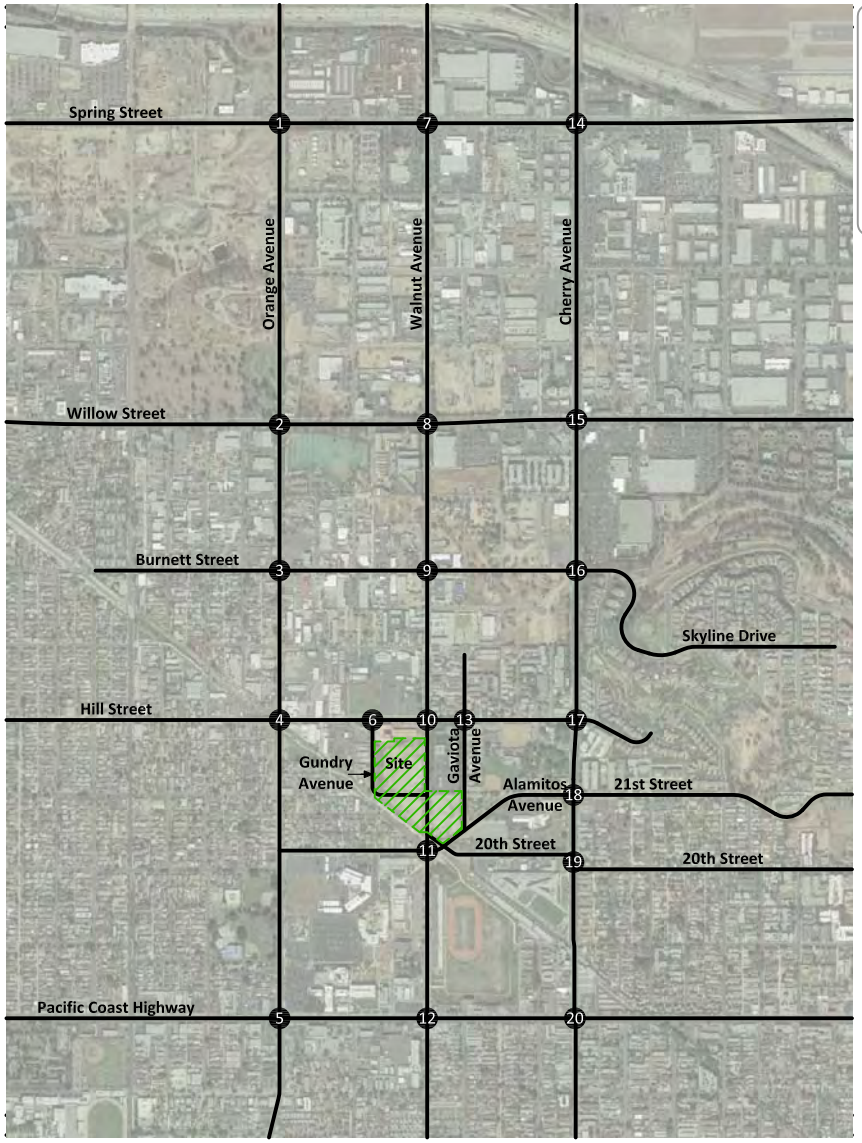
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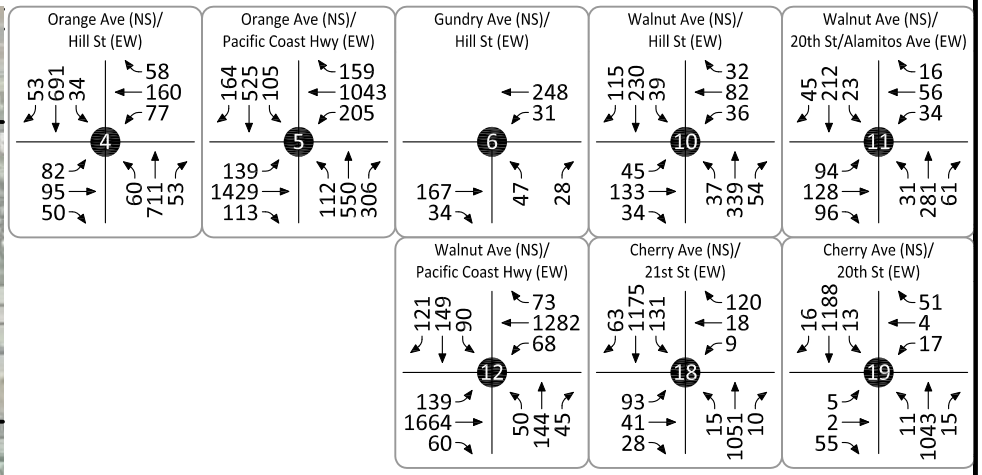
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OVER 40 YEARS OF EXCELLENT SERVICE

JN 7311

Figure 6
General Plan Buildout (Year 2040) Without Project
Afternoon School Peak Hour Intersection Turning Movement Volumes





Legend

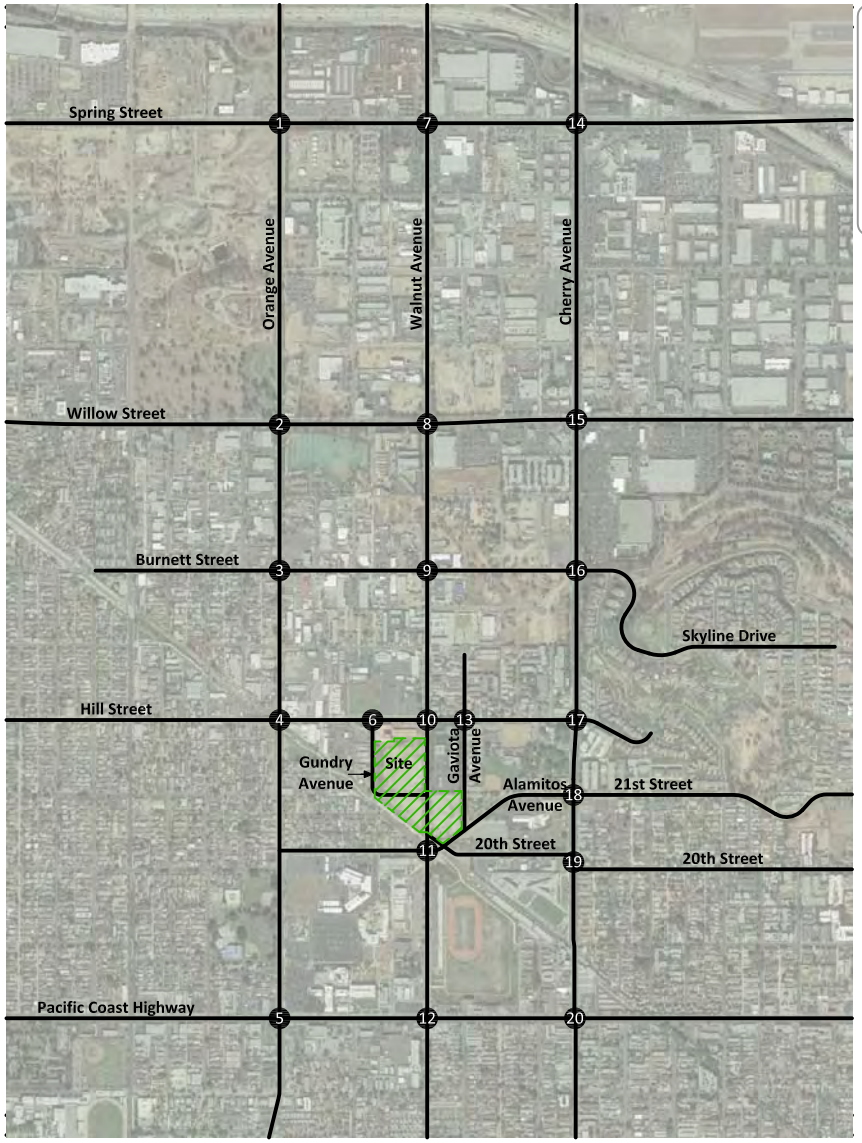
1 = Intersection Reference Number

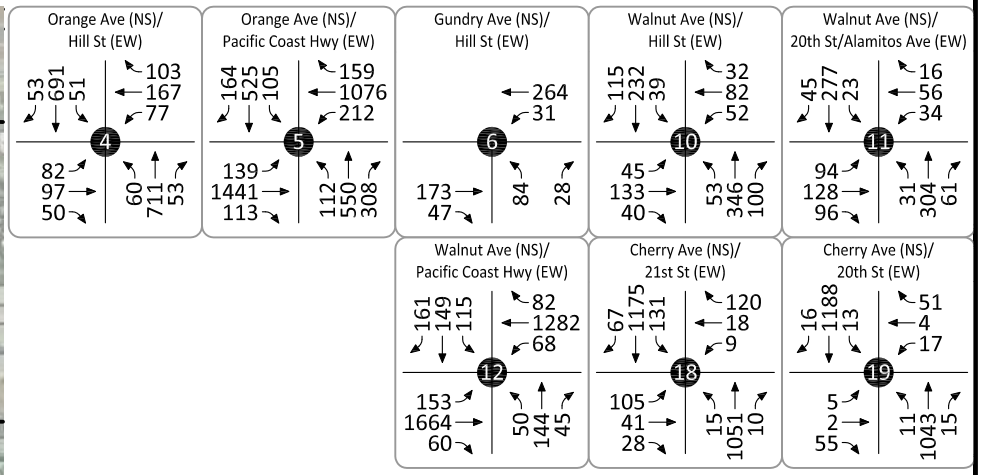
KUNZMAN ASSOCIATES, INC.

OVER 40 YEARS OF EXCELLENT SERVICE

JN 7311

Figure 7
General Plan Buildout (Year 2040) With Project
Afternoon School Peak Hour Intersection Turning Movement Volumes





Legend

1 = Intersection Reference Number

KUNZMAN ASSOCIATES, INC.

OVER 40 YEARS OF EXCELLENT SERVICE

JN 7311

APPENDIX A

Glossary of Transportation Terms

GLOSSARY OF TRANSPORTATION TERMS

COMMON ABBREVIATIONS

AC:	Acres
ADT:	Average Daily Traffic
Caltrans:	California Department of Transportation
DU:	Dwelling Unit
ICU:	Intersection Capacity Utilization
LOS:	Level of Service
TSF:	Thousand Square Feet
V/C:	Volume/Capacity
VMT:	Vehicle Miles Traveled

TERMS

AVERAGE DAILY TRAFFIC: The total volume during a year divided by the number of days in a year. Usually only weekdays are included.

BANDWIDTH: The number of seconds of green time available for through traffic in a signal progression.

BOTTLENECK: A constriction along a travelway that limits the amount of traffic that can proceed downstream from its location.

CAPACITY: The maximum number of vehicles that can be reasonably expected to pass over a given section of a lane or a roadway in a given time period.

CHANNELIZATION: The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movements of both vehicles and pedestrians.

CLEARANCE INTERVAL: Nearly same as yellow time. If there is an all red interval after the end of a yellow, then that is also added into the clearance interval.

CORDON: An imaginary line around an area across which vehicles, persons, or other items are counted (in and out).

CYCLE LENGTH: The time period in seconds required for one complete signal cycle.

CUL-DE-SAC STREET: A local street open at one end only, and with special provisions for turning around.

DAILY CAPACITY: The daily volume of traffic that will result in a volume during the peak hour equal to the capacity of the roadway.

DELAY: The time consumed while traffic is impeded in its movement by some element over which it has no control, usually expressed in seconds per vehicle.

DEMAND RESPONSIVE SIGNAL: Same as traffic-actuated signal.

DENSITY: The number of vehicles occupying in a unit length of the through traffic lanes of a roadway at any given instant. Usually expressed in vehicles per mile.

DETECTOR: A device that responds to a physical stimulus and transmits a resulting impulse to the signal controller.

DESIGN SPEED: A speed selected for purposes of design. Features of a highway, such as curvature, superelevation, and sight distance (upon which the safe operation of vehicles is dependent) are correlated to design speed.

DIRECTIONAL SPLIT: The percent of traffic in the peak direction at any point in time.

DIVERSION: The rerouting of peak hour traffic to avoid congestion.

FORCED FLOW: Opposite of free flow.

FREE FLOW: Volumes are well below capacity. Vehicles can maneuver freely and travel is unimpeded by other traffic.

GAP: Time or distance between successive vehicles in a traffic stream, rear bumper to front bumper.

HEADWAY: Time or distance spacing between successive vehicles in a traffic stream, front bumper to front bumper.

INTERCONNECTED SIGNAL SYSTEM: A number of intersections that are connected to achieve signal progression.

LEVEL OF SERVICE: A qualitative measure of a number of factors, which include speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs.

LOOP DETECTOR: A vehicle detector consisting of a loop of wire embedded in the roadway, energized by alternating current and producing an output circuit closure when passed over by a vehicle.

MINIMUM ACCEPTABLE GAP: Smallest time headway between successive vehicles in a traffic stream into which another vehicle is willing and able to cross or merge.

MULTI-MODAL: More than one mode; such as automobile, bus transit, rail rapid transit, and bicycle transportation modes.

OFFSET: The time interval in seconds between the beginning of green at one intersection and the beginning of green at an adjacent intersection.

PLATOON: A closely grouped component of traffic that is composed of several vehicles moving, or standing ready to move, with clear spaces ahead and behind.

ORIGIN-DESTINATION SURVEY: A survey to determine the point of origin and the point of destination for a given vehicle trip.

PASSENGER CAR EQUIVALENTS (PCE): One car is one Passenger Car Equivalent. A truck is equal to 2 or 3 Passenger Car Equivalents in that a truck requires longer to start, goes slower, and accelerates slower. Loaded trucks have a higher Passenger Car Equivalent than empty trucks.

PEAK HOUR: The 60 consecutive minutes with the highest number of vehicles.

PRETIMED SIGNAL: A type of traffic signal that directs traffic to stop and go on a predetermined time schedule without regard to traffic conditions. Also, fixed time signal.

PROGRESSION: A term used to describe the progressive movement of traffic through several signalized intersections.

SCREEN-LINE: An imaginary line or physical feature across which all trips are counted, normally to verify the validity of mathematical traffic models.

SIGNAL CYCLE: The time period in seconds required for one complete sequence of signal indications.

SIGNAL PHASE: The part of the signal cycle allocated to one or more traffic movements.

STARTING DELAY: The delay experienced in initiating the movement of queued traffic from a stop to an average running speed through a signalized intersection.

TRAFFIC-ACTUATED SIGNAL: A type of traffic signal that directs traffic to stop and go in accordance with the demands of traffic, as registered by the actuation of detectors.

TRIP: The movement of a person or vehicle from one location (origin) to another (destination). For example, from home to store to home is two trips, not one.

TRIP-END: One end of a trip at either the origin or destination (i.e., each trip has two trip-ends). A trip-end occurs when a person, object, or message is transferred to or from a vehicle.

TRIP GENERATION RATE: The quantity of trips produced and/or attracted by a specific land use stated in terms of units such as per dwelling, per acre, and per 1,000 square feet of floor space.

TRUCK: A vehicle having dual tires on one or more axles, or having more than two axles.

UNBALANCED FLOW: Heavier traffic flow in one direction than the other. On a daily basis, most facilities have balanced flow. During the peak hours, flow is seldom balanced in an urban area.

VEHICLE MILES OF TRAVEL: A measure of the amount of usage of a section of highway, obtained by multiplying the average daily traffic by length of facility in miles.

APPENDIX B

Intersection Turning Movement Count Worksheets

INTERSECTION TURNING MOVEMENT COUNTS

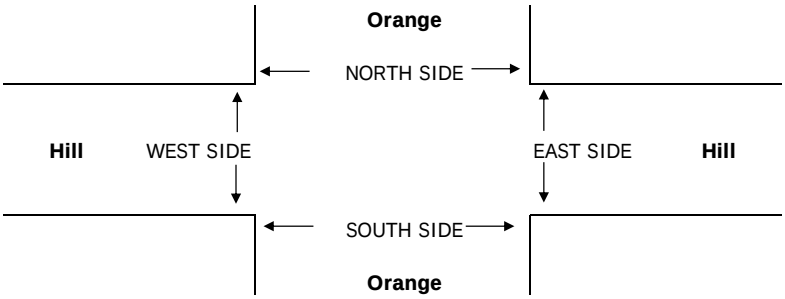
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1634
Wed, Feb 28, 18	NORTH & SOUTH:	Orange	LOCATION #:	4
	EAST & WEST:	Hill	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Orange			SOUTHBOUND Orange			EASTBOUND Hill			WESTBOUND Hill			
	LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 0	EL 0	ET 1	ER 1	WL 0	WT 1	WR 0	TOTAL
MIDDAY	1:30 PM	10	120	2	5	127	14	15	21	9	5	12	1	341
	1:45 PM	7	113	13	10	117	14	17	28	11	5	17	10	362
	2:00 PM	9	140	7	6	104	13	31	33	9	10	23	16	401
	2:15 PM	8	145	10	10	136	13	21	21	11	27	61	20	483
	2:30 PM	11	134	7	6	144	12	14	13	15	14	31	8	409
	2:45 PM	14	130	8	5	153	7	12	18	8	8	20	6	389
	3:00 PM	16	155	16	4	120	7	11	25	7	12	18	11	402
	3:15 PM	9	118	9	3	126	6	8	29	12	11	16	5	352
	VOLUMES	84	1,055	72	49	1,027	86	129	188	82	92	198	77	3,139
	APPROACH %	7%	87%	6%	4%	88%	7%	32%	47%	21%	25%	54%	21%	
	APP/DEPART	1,211	/	1,261	1,162	/	1,201	399	/	309	367	/	368	0
	BEGIN PEAK HR		2:15 PM											
	VOLUMES	49	564	41	25	553	39	58	77	41	61	130	45	1,683
	APPROACH %	7%	86%	6%	4%	90%	6%	33%	44%	23%	26%	55%	19%	
	PEAK HR FACTOR		0.874			0.935			0.830			0.546		0.871
	APP/DEPART	654	/	667	617	/	655	176	/	143	236	/	218	0



INTERSECTION TURNING MOVEMENT COUNTS

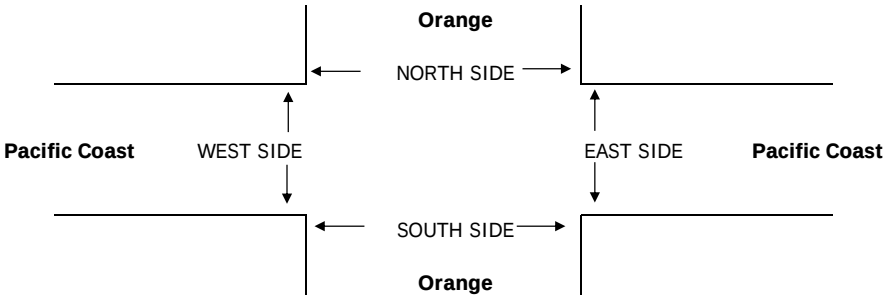
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1634
Wed, Feb 28, 18	NORTH & SOUTH:	Orange	LOCATION #:	5
	EAST & WEST:	Pacific Coast	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Orange			SOUTHBOUND Orange			EASTBOUND Pacific Coast			WESTBOUND Pacific Coast			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 3	ER 0	WL 1	WT 3	WR 0	TOTAL
MIDDAY	1:30 PM	19	97	35	19	93	22	20	219	25	41	159	29	778
	1:45 PM	18	102	40	20	104	31	18	210	33	36	178	26	816
	2:00 PM	26	89	55	24	81	33	28	209	22	36	192	33	828
	2:15 PM	24	99	48	25	103	32	21	259	24	46	246	20	947
	2:30 PM	28	113	62	21	92	38	21	251	20	36	210	30	922
	2:45 PM	16	98	64	17	114	31	32	322	29	54	216	32	1,025
	3:00 PM	26	117	62	25	113	32	23	305	24	35	195	34	991
	3:15 PM	22	116	63	23	106	23	23	285	20	43	220	34	978
	VOLUMES	179	831	429	174	806	242	186	2,060	197	327	1,616	238	7,285
	APPROACH %	12%	58%	30%	14%	66%	20%	8%	84%	8%	15%	74%	11%	
	APP/DEPART	1,439	/	1,255	1,222	/	1,330	2,443	/	2,663	2,181	/	2,037	0
	BEGIN PEAK HR		2:30 PM											
	VOLUMES	92	444	251	86	425	124	99	1,163	93	168	841	130	3,916
	APPROACH %	12%	56%	32%	14%	67%	20%	7%	86%	7%	15%	74%	11%	
	PEAK HR FACTOR		0.960			0.934			0.884			0.943		0.955
	APP/DEPART	787	/	673	635	/	686	1,355	/	1,500	1,139	/	1,057	0



INTERSECTION TURNING MOVEMENT COUNTS

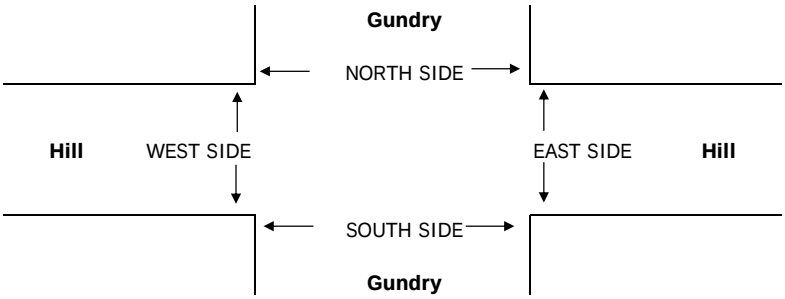
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:					
Wed, Feb 28, 18	LOCATION:	Signal Hill	PROJECT #:	SC1634
	NORTH & SOUTH:	Gundry	LOCATION #:	6
	EAST & WEST:	Hill	CONTROL:	STOP N

NOTES:

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

		NORTHBOUND Gundry			SOUTHBOUND Gundry			EASTBOUND Hill			WESTBOUND Hill			
	LANES:	NL 0	NT X	NR 0	SL X	ST X	SR X	EL X	ET 1	ER 0	WL 0	WT 1	WR X	TOTAL
MIDDAY	1:30 PM	2	0	1	0	0	0	0	34	1	5	17	0	60
	1:45 PM	3	0	3	0	0	0	1	40	5	5	34	0	91
	2:00 PM	10	0	7	0	0	0	1	35	6	10	50	0	119
	2:15 PM	10	0	3	0	0	0	0	36	6	6	89	0	150
	2:30 PM	10	0	10	0	0	0	0	26	5	4	30	0	85
	2:45 PM	5	0	2	0	0	0	1	28	3	1	24	0	64
	3:00 PM	2	0	1	0	0	0	0	46	1	5	22	0	77
	3:15 PM	3	0	3	0	0	0	1	39	5	5	29	0	85
	VOLUMES	45	0	30	0	0	0	4	284	32	41	295	0	731
	APPROACH %	60%	0%	40%	0%	0%	0%	1%	89%	10%	12%	88%	0%	
	APP/DEPART	75	/	0	0	/	67	320	/	320	336	/	344	0
	BEGIN PEAK HR		1:45 PM											
	VOLUMES	33	0	23	0	0	0	2	137	22	25	203	0	445
	APPROACH %	59%	0%	41%	0%	0%	0%	1%	85%	14%	11%	89%	0%	
	PEAK HR FACTOR		0.700			0.000			0.875			0.600		0.742
	APP/DEPART	56	/	0	0	/	44	161	/	163	228	/	238	0



INTERSECTION TURNING MOVEMENT COUNTS

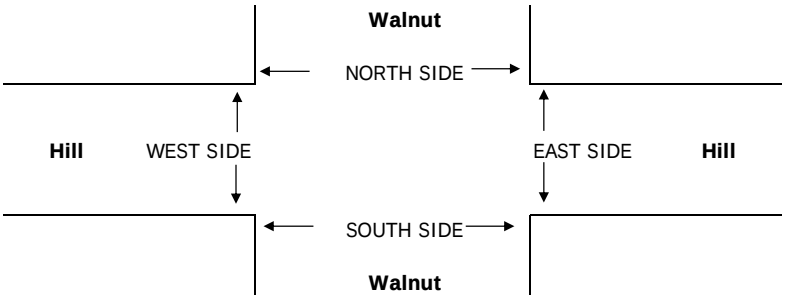
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1634
Wed, Feb 28, 18	NORTH & SOUTH:	Walnut	LOCATION #:	10
	EAST & WEST:	Hill	CONTROL:	STOP ALL

NOTES:

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

		NORTHBOUND Walnut			SOUTHBOUND Walnut			EASTBOUND Hill			WESTBOUND Hill			
	LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 1	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
MIDDAY	1:30 PM	5	36	6	5	34	8	9	13	2	8	15	4	145
	1:45 PM	5	34	5	9	57	18	11	27	8	6	16	8	204
	2:00 PM	7	41	4	13	34	20	11	24	8	6	24	4	196
	2:15 PM	9	46	3	17	54	57	7	29	13	15	24	7	281
	2:30 PM	5	64	15	7	39	17	9	24	7	6	14	4	211
	2:45 PM	8	75	13	6	47	3	4	23	4	2	14	8	207
	3:00 PM	8	88	12	2	45	17	17	33	4	4	15	7	252
	3:15 PM	5	63	3	3	59	12	11	21	7	3	16	3	206
	VOLUMES	52	447	61	62	369	152	79	194	53	50	138	45	1,702
	APPROACH %	9%	80%	11%	11%	63%	26%	24%	60%	16%	21%	59%	19%	
	APP/DEPART	560	/	570	583	/	473	326	/	317	233	/	342	0
	BEGIN PEAK HR		2:15 PM											
	VOLUMES	30	273	43	32	185	94	37	109	28	27	67	26	951
	APPROACH %	9%	79%	12%	10%	59%	30%	21%	63%	16%	23%	56%	22%	
	PEAK HR FACTOR		0.801			0.607			0.806			0.652		0.846
	APP/DEPART	346	/	336	311	/	240	174	/	184	120	/	191	0



INTERSECTION TURNING MOVEMENT COUNTS

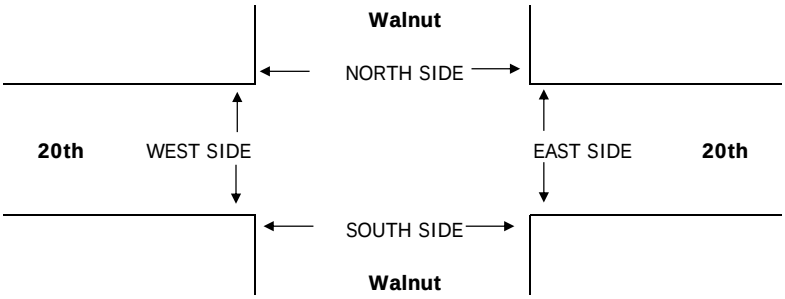
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1634
Wed, Feb 28, 18	NORTH & SOUTH:	Walnut	LOCATION #:	11
	EAST & WEST:	20th	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Walnut			SOUTHBOUND Walnut			EASTBOUND 20th			WESTBOUND 20th			
	LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
MIDDAY	1:30 PM	3	34	7	2	27	9	13	17	6	12	4	6	140
	1:45 PM	6	39	7	7	48	9	0	13	11	12	9	4	165
	2:00 PM	6	37	22	3	31	6	11	21	14	12	11	8	182
	2:15 PM	6	42	14	7	57	14	5	19	9	12	19	6	210
	2:30 PM	9	51	9	3	38	11	12	17	11	6	19	6	192
	2:45 PM	6	45	5	6	39	8	32	33	34	5	11	1	225
	3:00 PM	6	76	19	0	42	7	20	29	17	5	7	3	231
	3:15 PM	4	52	17	10	50	11	13	26	17	12	9	3	224
	VOLUMES	46	376	100	38	332	75	106	175	119	76	89	37	1,569
	APPROACH %	9%	72%	19%	9%	75%	17%	27%	44%	30%	38%	44%	18%	
	APP/DEPART	522	/	519	445	/	527	400	/	313	202	/	210	0
	BEGIN PEAK HR		2:30 PM											
	VOLUMES	25	224	50	19	169	37	77	105	79	28	46	13	872
	APPROACH %	8%	75%	17%	8%	75%	16%	30%	40%	30%	32%	53%	15%	
	PEAK HR FACTOR		0.740			0.792			0.659			0.702		0.944
	APP/DEPART	299	/	314	225	/	276	261	/	174	87	/	108	0



INTERSECTION TURNING MOVEMENT COUNTS

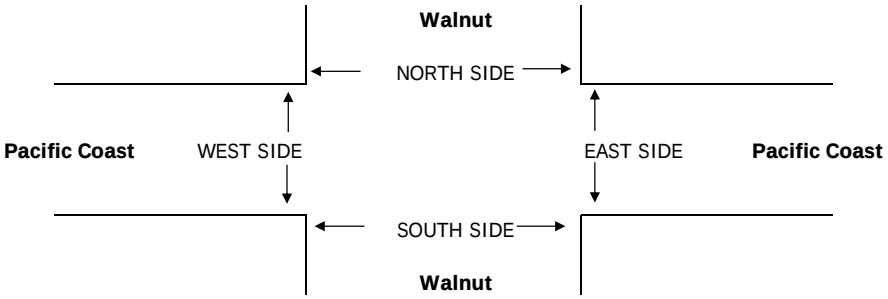
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:					
Wed, Feb 28, 18	LOCATION:	Signal Hill	PROJECT #:	SC1634
	NORTH & SOUTH:	Walnut	LOCATION #:	12
	EAST & WEST:	Pacific Coast	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Walnut			SOUTHBOUND Walnut			EASTBOUND Pacific Coast			WESTBOUND Pacific Coast			
	LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 1	ET 3	ER 0	WL 1	WT 3	WR 0	TOTAL
MIDDAY	1:30 PM	10	16	18	13	20	10	15	263	19	9	180	40	613
	1:45 PM	8	23	4	13	26	31	25	233	16	6	232	22	639
	2:00 PM	12	18	10	18	23	17	29	240	14	8	230	17	636
	2:15 PM	8	24	12	19	23	35	23	284	26	12	274	17	757
	2:30 PM	13	21	9	12	28	15	29	307	16	11	248	15	724
	2:45 PM	11	17	12	22	25	30	31	365	13	18	265	16	825
	3:00 PM	9	39	9	16	28	29	21	352	12	11	239	14	779
	3:15 PM	8	36	7	22	38	25	33	332	8	16	285	13	823
	VOLUMES	79	194	81	135	211	192	206	2,376	124	91	1,953	154	5,796
	APPROACH %	22%	55%	23%	25%	39%	36%	8%	88%	5%	4%	89%	7%	
	APP/DEPART	354	/	554	538	/	426	2,706	/	2,592	2,198	/	2,224	0
	BEGIN PEAK HR		2:30 PM											
	VOLUMES	41	113	37	72	119	99	114	1,356	49	56	1,037	58	3,151
	APPROACH %	21%	59%	19%	25%	41%	34%	8%	89%	3%	5%	90%	5%	
	PEAK HR FACTOR		0.838			0.853			0.928			0.916		0.955
	APP/DEPART	191	/	285	290	/	224	1,519	/	1,465	1,151	/	1,177	0



INTERSECTION TURNING MOVEMENT COUNTS

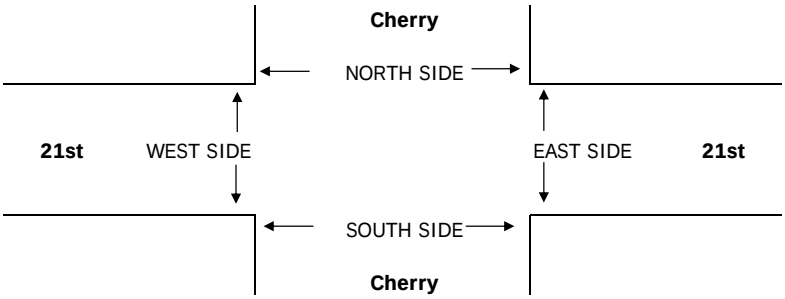
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1634
Wed, Feb 28, 18	NORTH & SOUTH:	Cherry	LOCATION #:	18
	EAST & WEST:	21st	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Cherry			SOUTHBOUND Cherry			EASTBOUND 21st			WESTBOUND 21st			
	LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 0	ET 1	ER 0	WL 1	WT 1	WR 0	TOTAL
MIDDAY	1:30 PM	11	197	2	14	213	14	11	3	2	3	6	25	501
	1:45 PM	7	216	1	27	239	19	10	4	3	1	4	21	552
	2:00 PM	4	200	0	21	208	8	17	12	10	6	8	18	512
	2:15 PM	1	196	1	30	249	13	21	12	6	1	3	21	554
	2:30 PM	4	225	2	22	239	20	15	5	7	2	5	19	565
	2:45 PM	4	204	3	24	251	9	20	8	6	1	4	23	557
	3:00 PM	3	217	2	29	213	10	20	9	4	3	3	31	544
	3:15 PM	3	203	1	26	223	11	17	10	6	1	2	21	524
	VOLUMES	37	1,658	12	193	1,835	104	131	63	44	18	35	179	4,309
	APPROACH %	2%	97%	1%	9%	86%	5%	55%	26%	18%	8%	15%	77%	
	APP/DEPART	1,707	/	1,980	2,132	/	1,900	238	/	256	232	/	173	0
	BEGIN PEAK HR		2:15 PM											
	VOLUMES	12	842	8	105	952	52	76	34	23	7	15	94	2,220
	APPROACH %	1%	98%	1%	9%	86%	5%	57%	26%	17%	6%	13%	81%	
	PEAK HR FACTOR		0.933			0.949			0.853			0.784		0.982
	APP/DEPART	862	/	1,017	1,109	/	985	133	/	142	116	/	76	0



INTERSECTION TURNING MOVEMENT COUNTS

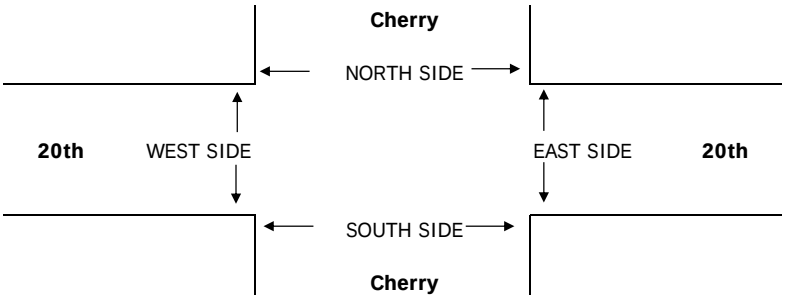
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1634
Wed, Feb 28, 18	NORTH & SOUTH:	Cherry	LOCATION #:	19
	EAST & WEST:	20th	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Cherry			SOUTHBOUND Cherry			EASTBOUND 20th			WESTBOUND 20th			
	LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 1	ET 0	ER 1	WL 0	WT 1	WR 0	TOTAL
MIDDAY	1:30 PM	3	202	2	2	210	7	4	0	6	2	0	6	444
	1:45 PM	4	205	2	0	226	3	4	0	3	1	3	12	463
	2:00 PM	2	195	2	2	219	6	5	4	12	2	7	5	461
	2:15 PM	5	189	3	2	214	10	7	7	21	3	2	3	466
	2:30 PM	2	227	4	2	266	4	1	1	9	4	0	9	529
	2:45 PM	1	190	2	3	255	1	2	1	14	5	1	8	483
	3:00 PM	2	202	4	0	202	2	0	0	10	3	0	14	439
	3:15 PM	4	220	2	3	242	6	1	0	12	2	2	7	501
	VOLUMES	23	1,630	21	14	1,834	39	24	13	87	22	15	64	3,786
	APPROACH %	1%	97%	1%	1%	97%	2%	19%	10%	70%	22%	15%	63%	
	APP/DEPART	1,674	/	1,718	1,887	/	1,944	124	/	47	101	/	77	0
	BEGIN PEAK HR		2:30 PM											
	VOLUMES	9	839	12	8	965	13	4	2	45	14	3	38	1,952
	APPROACH %	1%	98%	1%	1%	98%	1%	8%	4%	88%	25%	5%	69%	
	PEAK HR FACTOR		0.923			0.906			0.750			0.809		0.922
	APP/DEPART	860	/	881	986	/	1,024	51	/	22	55	/	25	0



APPENDIX C

Intersection Capacity Utilization/Delay and Level of Service Worksheets

Existing

Signal Hill Business Park

Vistro File: Z:\...\School PM.vistro
Report File: Z:\...\School PM - E.pdf

Scenario 1 Existing
3/6/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Right	0.656	-	B
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.559	20.4	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.090	13.2	B
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.650	14.8	B
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	NB Thru	0.564	-	A
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	SB Thru	0.505	9.9	A
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	SB Thru	0.544	-	A
19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	SB Thru	0.475	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.656

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	141	10	6	138	10	15	19	10	15	33	11
Total Analysis Volume [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.38	0.38	0.02	0.37	0.37	0.04	0.08	0.03	0.04	0.12	0.03
Intersection LOS	B											
Intersection V/C	0.656											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	20.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.559

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	92	444	251	86	425	124	99	1163	93	168	841	130
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	92	444	251	86	425	124	99	1163	93	168	841	130
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	116	66	23	111	32	26	304	24	44	220	34
Total Analysis Volume [veh/h]	96	465	263	90	445	130	104	1218	97	176	881	136
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	11	33	0	16	38	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	37	21	21	21	6	36	36	11	40	40
g / C, Green / Cycle	0.27	0.27	0.46	0.27	0.27	0.27	0.08	0.44	0.44	0.14	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.10	0.13	0.16	0.10	0.12	0.08	0.06	0.24	0.24	0.10	0.19	0.19
s, saturation flow rate [veh/h]	960	3618	1615	942	3618	1615	1810	3618	1829	1810	3618	1773
c, Capacity [veh/h]	222	969	737	215	969	433	145	1605	812	251	1818	891
d1, Uniform Delay [s]	33.05	24.63	14.14	33.29	24.48	23.35	35.96	16.33	16.33	32.91	12.22	12.22
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.32	0.37	0.29	1.30	0.34	0.39	6.54	1.33	2.61	3.55	0.59	1.21
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.43	0.48	0.36	0.42	0.46	0.30	0.72	0.54	0.54	0.70	0.38	0.38
d, Delay for Lane Group [s/veh]	34.37	25.00	14.43	34.59	24.82	23.73	42.51	17.66	18.95	36.47	12.81	13.44
Lane Group LOS	C	C	B	C	C	C	D	B	B	D	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	1.79	3.56	2.88	1.71	3.44	1.94	2.18	5.63	5.98	3.38	3.49	3.59
50th-Percentile Queue Length [ft]	44.81	88.98	72.01	42.69	86.02	48.46	54.46	140.63	149.45	84.46	87.33	89.66
95th-Percentile Queue Length [veh]	3.23	6.41	5.18	3.07	6.19	3.49	3.92	9.52	9.99	6.08	6.29	6.46
95th-Percentile Queue Length [ft]	80.66	160.17	129.62	76.85	154.84	87.22	98.02	237.88	249.70	152.02	157.20	161.38

Movement, Approach, & Intersection Results

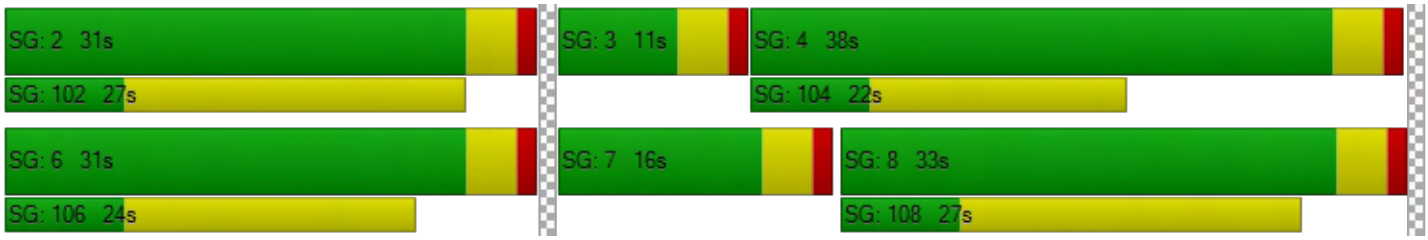
d_M, Delay for Movement [s/veh]	34.37	25.00	14.43	34.59	24.82	23.73	42.51	18.03	18.95	36.47	12.95	13.44
Movement LOS	C	C	B	C	C	C	D	B	B	D	B	B
d_A, Approach Delay [s/veh]	22.72			25.93			19.88			16.48		
Approach LOS	C			C			B			B		
d_I, Intersection Delay [s/veh]	20.44											
Intersection LOS	C											
Intersection V/C	0.559											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.739	2.669	3.134	3.164
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	675	675	725	850
d_b, Bicycle Delay [s]	17.56	17.56	16.26	13.23
l_b,int, Bicycle LOS Score for Intersection	2.239	2.108	2.340	2.216
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	13.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.090

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	33	23	137	22	25	203
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	23	137	22	25	203
Peak Hour Factor	0.7420	0.7420	0.7420	0.7420	0.7420	0.7420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	8	46	7	8	68
Total Analysis Volume [veh/h]	44	31	185	30	34	274
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.04	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	13.22	10.13	0.00	0.00	7.70	0.00
Movement LOS	B	B	A	A	A	A
95th-Percentile Queue Length [veh]	0.43	0.43	0.00	0.00	0.87	0.87
95th-Percentile Queue Length [ft]	10.78	10.78	0.00	0.00	21.67	21.67
d_A, Approach Delay [s/veh]	11.94		0.00		0.85	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	1.94					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	14.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.650

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	30	273	43	32	185	94	37	109	28	27	67	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	273	43	32	185	94	37	109	28	27	67	26
Peak Hour Factor	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	81	13	9	55	28	11	32	8	8	20	8
Total Analysis Volume [veh/h]	35	323	51	38	219	111	44	129	33	32	79	31
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	629	566	646	570	557
Degree of Utilization, x	0.65	0.45	0.17	0.36	0.26

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.75	2.35	0.62	1.64	1.01
95th-Percentile Queue Length [ft]	118.80	58.83	15.43	40.99	25.20
Approach Delay [s/veh]	18.71	12.79		12.85	11.67
Approach LOS	C	B		B	B
Intersection Delay [s/veh]	14.82				
Intersection LOS	B				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.564

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	25	224	50	19	169	37	77	105	79	28	46	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	224	50	19	169	37	77	105	79	28	46	13
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	56	13	5	42	9	19	26	20	7	12	3
Total Analysis Volume [veh/h]	25	224	50	19	169	37	77	105	79	28	46	13
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.17	0.17	0.01	0.13	0.13	0.05	0.16	0.16	0.02	0.05	0.05
Intersection LOS	A											
Intersection V/C	0.564											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	9.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.505

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	41	113	37	72	119	99	114	1356	49	56	1037	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	41	113	37	72	119	99	114	1356	49	56	1037	58
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	30	10	19	31	26	30	355	13	15	271	15
Total Analysis Volume [veh/h]	43	118	39	75	125	104	119	1420	51	59	1086	61
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	37.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	32	0	0	32	0	0	48	0	0	48	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	55	55	55	55	55	55
g / C, Green / Cycle	0.21	0.21	0.69	0.69	0.69	0.69	0.69	0.69
(v / s)_i Volume / Saturation Flow Rate	0.13	0.19	0.24	0.27	0.27	0.16	0.21	0.21
s, saturation flow rate [veh/h]	1593	1630	498	3618	1866	366	3618	1849
c, Capacity [veh/h]	389	398	380	2496	1288	291	2496	1276
d1, Uniform Delay [s]	28.09	30.52	9.18	5.25	5.25	9.62	4.86	4.86
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.05	3.06	2.15	0.46	0.89	1.56	0.31	0.62
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.51	0.76	0.31	0.39	0.39	0.20	0.30	0.30
d, Delay for Lane Group [s/veh]	29.15	33.58	11.32	5.70	6.13	11.18	5.17	5.48
Lane Group LOS	C	C	B	A	A	B	A	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh]	3.42	5.80	1.23	2.83	3.07	0.63	2.04	2.19
50th-Percentile Queue Length [ft]	85.48	145.06	30.77	70.65	76.74	15.67	51.02	54.86
95th-Percentile Queue Length [veh]	6.15	9.75	2.22	5.09	5.53	1.13	3.67	3.95
95th-Percentile Queue Length [ft]	153.87	243.82	55.39	127.16	138.14	28.21	91.83	98.76

Movement, Approach, & Intersection Results

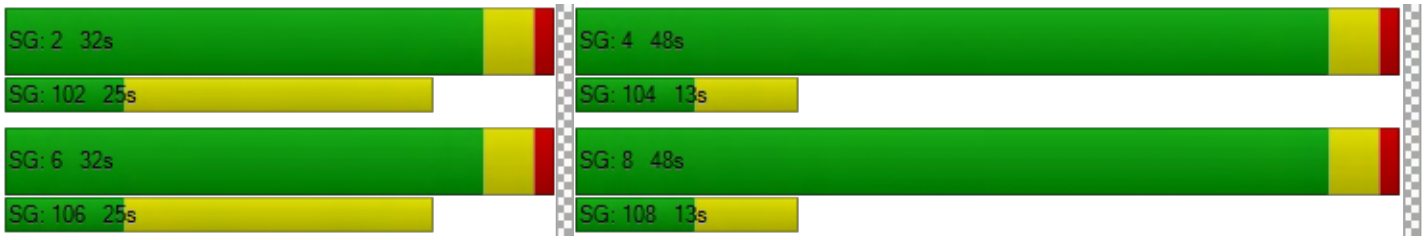
d_M, Delay for Movement [s/veh]	29.15	29.15	29.15	33.58	33.58	33.58	11.32	5.84	6.13	11.18	5.26	5.48
Movement LOS	C	C	C	C	C	C	B	A	A	B	A	A
d_A, Approach Delay [s/veh]	29.15			33.58			6.26			5.56		
Approach LOS	C			C			A			A		
d_I, Intersection Delay [s/veh]	9.91											
Intersection LOS	A											
Intersection V/C	0.505											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.004	2.298	3.042	3.076
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	700	700	1100	1100
d_b, Bicycle Delay [s]	16.90	16.90	8.10	8.10
l_b,int, Bicycle LOS Score for Intersection	1.890	2.061	2.434	2.223
Bicycle LOS	A	B	B	B

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.544

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	12	842	8	105	952	52	76	34	23	7	15	94
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	842	8	105	952	52	76	34	23	7	15	94
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	211	2	26	238	13	19	9	6	2	4	24
Total Analysis Volume [veh/h]	12	842	8	105	952	52	76	34	23	7	15	94
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.26	0.01	0.07	0.30	0.03	0.05	0.07	0.01	0.00	0.07	0.07
Intersection LOS	A											
Intersection V/C	0.544											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.475

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	9	839	12	8	965	13	4	2	45	14	3	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	839	12	8	965	13	4	2	45	14	3	38
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	210	3	2	241	3	1	1	11	4	1	10
Total Analysis Volume [veh/h]	9	839	12	8	965	13	4	2	45	14	3	38
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.27	0.27	0.01	0.31	0.31	0.00	0.03	0.03	0.01	0.03	0.03
Intersection LOS	A											
Intersection V/C	0.475											

Existing Plus Project

Signal Hill Business Park

Vistro File: Z:\...\School PM.vistro
Report File: Z:\...\School PM - EP.pdf

Scenario 2 Existing Plus Project
3/6/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Right	0.664	-	B
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.567	20.5	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.202	14.9	B
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.803	19.6	C
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	NB Thru	0.578	-	A
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	SB Right	0.559	11.6	B
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	SB Thru	0.552	-	A
19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	SB Thru	0.475	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.664

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	17	0	0	0	2	0	0	7	45
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	564	41	42	553	39	58	79	41	61	137	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	141	10	11	138	10	15	20	10	15	34	23
Total Analysis Volume [veh/h]	49	564	41	42	553	39	58	79	41	61	137	90
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.38	0.38	0.03	0.37	0.37	0.04	0.09	0.03	0.04	0.12	0.06
Intersection LOS	B											
Intersection V/C	0.664											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	20.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.567

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	92	444	251	86	425	124	99	1163	93	168	841	130
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	2	0	0	0	0	12	0	7	33	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	92	444	253	86	425	124	99	1175	93	175	874	130
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	116	66	23	111	32	26	308	24	46	229	34
Total Analysis Volume [veh/h]	96	465	265	90	445	130	104	1230	97	183	915	136
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	11	33	0	16	38	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	37	21	21	21	6	35	35	11	40	40
g / C, Green / Cycle	0.27	0.27	0.46	0.27	0.27	0.27	0.08	0.44	0.44	0.14	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.10	0.13	0.16	0.10	0.12	0.08	0.06	0.24	0.24	0.10	0.19	0.20
s, saturation flow rate [veh/h]	960	3618	1615	942	3618	1615	1810	3618	1830	1810	3618	1777
c, Capacity [veh/h]	223	969	739	215	969	433	145	1601	810	253	1817	893
d1, Uniform Delay [s]	33.05	24.63	14.09	33.29	24.48	23.34	35.96	16.46	16.46	32.96	12.31	12.32
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.32	0.37	0.29	1.29	0.34	0.39	6.54	1.37	2.69	3.89	0.63	1.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.43	0.48	0.36	0.42	0.46	0.30	0.72	0.55	0.55	0.72	0.39	0.39
d, Delay for Lane Group [s/veh]	34.36	25.00	14.38	34.58	24.82	23.73	42.51	17.83	19.15	36.85	12.94	13.59
Lane Group LOS	C	C	B	C	C	C	D	B	B	D	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	1.79	3.56	2.90	1.71	3.44	1.94	2.18	5.71	6.08	3.54	3.64	3.74
50th-Percentile Queue Length [ft]	44.81	88.98	72.43	42.69	86.01	48.45	54.46	142.84	151.92	88.42	90.96	93.54
95th-Percentile Queue Length [veh]	3.23	6.41	5.22	3.07	6.19	3.49	3.92	9.63	10.12	6.37	6.55	6.73
95th-Percentile Queue Length [ft]	80.65	160.16	130.38	76.84	154.82	87.21	98.02	240.84	252.98	159.16	163.72	168.37

Movement, Approach, & Intersection Results

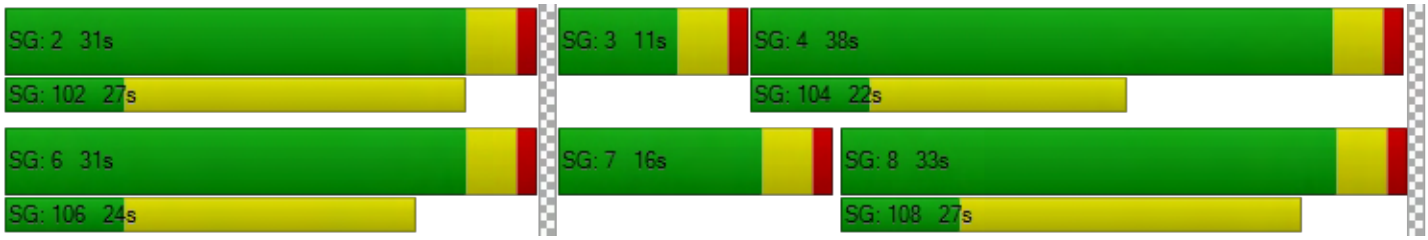
d_M, Delay for Movement [s/veh]	34.36	25.00	14.38	34.58	24.82	23.73	42.51	18.20	19.15	36.85	13.09	13.59
Movement LOS	C	C	B	C	C	C	D	B	B	D	B	B
d_A, Approach Delay [s/veh]	22.68			25.93			20.03			16.67		
Approach LOS	C			C			C			B		
d_I, Intersection Delay [s/veh]	20.50											
Intersection LOS	C											
Intersection V/C	0.567											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.740	2.669	3.142	3.173
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	675	675	725	850
d_b, Bicycle Delay [s]	17.56	17.56	16.26	13.23
l_b,int, Bicycle LOS Score for Intersection	2.241	2.108	2.347	2.238
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	14.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.202

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	33	23	137	22	25	203
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	37	0	6	13	0	16
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	70	23	143	35	25	219
Peak Hour Factor	0.7420	0.7420	0.7420	0.7420	0.7420	0.7420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	8	48	12	8	74
Total Analysis Volume [veh/h]	94	31	193	47	34	295
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.20	0.04	0.00	0.00	0.03	0.00
d_M, Delay for Movement [s/veh]	14.89	11.50	0.00	0.00	7.76	0.00
Movement LOS	B	B	A	A	A	A
95th-Percentile Queue Length [veh]	0.93	0.93	0.00	0.00	0.97	0.97
95th-Percentile Queue Length [ft]	23.16	23.16	0.00	0.00	24.26	24.26
d_A, Approach Delay [s/veh]	14.05		0.00		0.80	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	2.91					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	19.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.803

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	30	273	43	32	185	94	37	109	28	27	67	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	7	46	0	2	0	0	0	6	16	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	46	280	89	32	187	94	37	109	34	43	67	26
Peak Hour Factor	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	83	26	9	55	28	11	32	10	13	20	8
Total Analysis Volume [veh/h]	54	331	105	38	221	111	44	129	40	51	79	31
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	610	536	607	536	521
Degree of Utilization, x	0.80	0.48	0.18	0.40	0.31

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	7.97	2.61	0.66	1.89	1.30
95th-Percentile Queue Length [ft]	199.33	65.29	16.61	47.29	32.58
Approach Delay [s/veh]	28.52	13.87		14.09	12.97
Approach LOS	D	B		B	B
Intersection Delay [s/veh]	19.61				
Intersection LOS	C				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.578

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	25	224	50	19	169	37	77	105	79	28	46	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	0	0	65	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	247	50	19	234	37	77	105	79	28	46	13
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	62	13	5	59	9	19	26	20	7	12	3
Total Analysis Volume [veh/h]	25	247	50	19	234	37	77	105	79	28	46	13
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.19	0.19	0.01	0.17	0.17	0.05	0.16	0.16	0.02	0.05	0.05
Intersection LOS	A											
Intersection V/C	0.578											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	11.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.559

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	41	113	37	72	119	99	114	1356	49	56	1037	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	25	0	40	14	0	0	0	0	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	41	113	37	97	119	139	128	1356	49	56	1037	67
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	30	10	25	31	36	34	355	13	15	271	18
Total Analysis Volume [veh/h]	43	118	39	102	125	146	134	1420	51	59	1086	70
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	36.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	36	0	0	36	0	0	44	0	0	44	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	51	51	51	51	51	51
g / C, Green / Cycle	0.26	0.26	0.64	0.64	0.64	0.64	0.64	0.64
(v / s)_i Volume / Saturation Flow Rate	0.13	0.23	0.27	0.27	0.27	0.16	0.21	0.21
s, saturation flow rate [veh/h]	1572	1609	494	3618	1866	366	3618	1842
c, Capacity [veh/h]	457	469	348	2329	1202	268	2329	1186
d1, Uniform Delay [s]	24.83	28.59	12.50	6.93	6.93	12.49	6.43	6.43
k, delay calibration	0.11	0.14	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.66	4.08	3.20	0.55	1.07	1.88	0.38	0.74
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.44	0.79	0.38	0.42	0.42	0.22	0.33	0.33
d, Delay for Lane Group [s/veh]	25.49	32.67	15.69	7.48	8.00	14.37	6.81	7.18
Lane Group LOS	C	C	B	A	A	B	A	A
Critical Lane Group	No	Yes	Yes	No	No	No	No	No
50th-Percentile Queue Length [veh]	3.14	7.13	1.73	3.52	3.81	0.74	2.57	2.74
50th-Percentile Queue Length [ft]	78.56	178.22	43.28	88.02	95.14	18.45	64.28	68.52
95th-Percentile Queue Length [veh]	5.66	11.51	3.12	6.34	6.85	1.33	4.63	4.93
95th-Percentile Queue Length [ft]	141.40	287.69	77.90	158.44	171.26	33.22	115.71	123.34

Movement, Approach, & Intersection Results

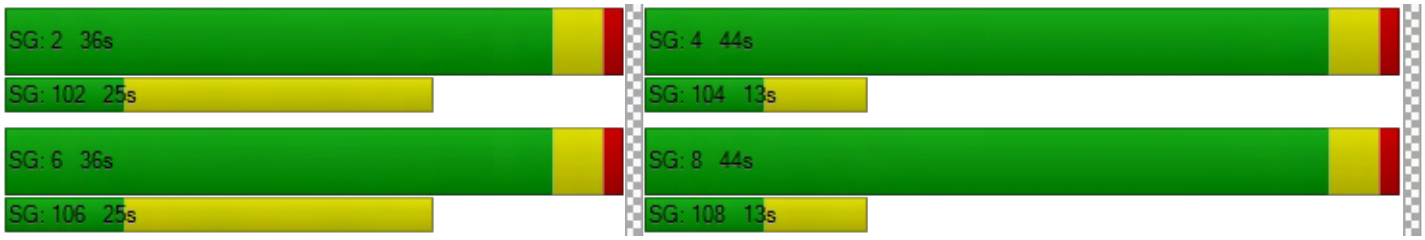
d_M, Delay for Movement [s/veh]	25.49	25.49	25.49	32.67	32.67	32.67	15.69	7.64	8.00	14.37	6.92	7.18
Movement LOS	C	C	C	C	C	C	B	A	A	B	A	A
d_A, Approach Delay [s/veh]	25.49			32.67			8.33			7.30		
Approach LOS	C			C			A			A		
d_I, Intersection Delay [s/veh]	11.65											
Intersection LOS	B											
Intersection V/C	0.559											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.004	2.350	3.050	3.119
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	800	800	1000	1000
d_b, Bicycle Delay [s]	14.40	14.40	10.00	10.00
l_b,int, Bicycle LOS Score for Intersection	1.890	2.175	2.442	2.228
Bicycle LOS	A	B	B	B

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.552

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	12	842	8	105	952	52	76	34	23	7	15	94
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	4	12	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	842	8	105	952	56	88	34	23	7	15	94
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	211	2	26	238	14	22	9	6	2	4	24
Total Analysis Volume [veh/h]	12	842	8	105	952	56	88	34	23	7	15	94
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.26	0.01	0.07	0.30	0.04	0.06	0.08	0.01	0.00	0.07	0.07
Intersection LOS	A											
Intersection V/C	0.552											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.475

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	9	839	12	8	965	13	4	2	45	14	3	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	839	12	8	965	13	4	2	45	14	3	38
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	210	3	2	241	3	1	1	11	4	1	10
Total Analysis Volume [veh/h]	9	839	12	8	965	13	4	2	45	14	3	38
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.27	0.27	0.01	0.31	0.31	0.00	0.03	0.03	0.01	0.03	0.03
Intersection LOS	A											
Intersection V/C	0.475											

Opening Year (2020) Without Project

Signal Hill Business Park

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Scenario 3 Opening Year Without Project
3/6/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Thru	0.690	-	B
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.571	21.0	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.115	13.6	B
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.691	15.9	C
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	NB Thru	0.576	-	A
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	SB Thru	0.524	10.3	B
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	SB Thru	0.566	-	A
19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	SB Right	0.489	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.690

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	3	16	5	11	1	0	3	1	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	598	45	29	580	45	70	80	42	65	134	49
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	150	11	7	145	11	18	20	11	16	34	12
Total Analysis Volume [veh/h]	50	598	45	29	580	45	70	80	42	65	134	49
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.40	0.40	0.02	0.39	0.39	0.04	0.09	0.03	0.04	0.12	0.03
Intersection LOS	B											
Intersection V/C	0.690											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	21.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.571

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	92	444	251	86	425	124	99	1163	93	168	841	130
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	0	0	6	13	18	10	0	0	17	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	94	461	256	88	440	139	119	1196	95	171	875	133
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	121	67	23	115	36	31	313	25	45	229	35
Total Analysis Volume [veh/h]	98	483	268	92	461	146	125	1252	99	179	916	139
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	13	33	0	16	36	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	37	22	22	22	7	35	35	11	39	39
g / C, Green / Cycle	0.27	0.27	0.46	0.27	0.27	0.27	0.09	0.44	0.44	0.14	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.10	0.13	0.17	0.10	0.13	0.09	0.07	0.25	0.25	0.10	0.20	0.20
s, saturation flow rate [veh/h]	946	3618	1615	927	3618	1615	1810	3618	1830	1810	3618	1775
c, Capacity [veh/h]	223	988	748	215	988	441	164	1581	799	254	1761	864
d1, Uniform Delay [s]	33.03	24.45	13.85	33.33	24.28	23.29	35.63	16.90	16.90	32.88	13.12	13.12
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.36	0.38	0.29	1.35	0.34	0.44	7.21	1.48	2.91	3.56	0.68	1.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.44	0.49	0.36	0.43	0.47	0.33	0.76	0.57	0.57	0.70	0.40	0.40
d, Delay for Lane Group [s/veh]	34.40	24.83	14.14	34.68	24.62	23.73	42.84	18.38	19.81	36.44	13.80	14.52
Lane Group LOS	C	C	B	C	C	C	D	B	B	D	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	1.83	3.68	2.90	1.75	3.55	2.18	2.63	5.95	6.33	3.44	3.82	3.93
50th-Percentile Queue Length [ft]	45.80	92.11	72.39	43.75	88.75	54.54	65.75	148.69	158.32	85.92	95.55	98.19
95th-Percentile Queue Length [veh]	3.30	6.63	5.21	3.15	6.39	3.93	4.73	9.95	10.46	6.19	6.88	7.07
95th-Percentile Queue Length [ft]	82.43	165.79	130.29	78.74	159.75	98.18	118.35	248.67	261.50	154.66	172.00	176.75

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.40	24.83	14.14	34.68	24.62	23.73	42.84	18.79	19.81	36.44	13.97	14.52
Movement LOS	C	C	B	C	C	C	D	B	B	D	B	B
d_A, Approach Delay [s/veh]	22.56			25.76			20.89			17.29		
Approach LOS	C			C			C			B		
d_I, Intersection Delay [s/veh]	20.98											
Intersection LOS	C											
Intersection V/C	0.571											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.747	2.681	3.155	3.181
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	675	675	725	800
d_b, Bicycle Delay [s]	17.56	17.56	16.26	14.40
l_b,int, Bicycle LOS Score for Intersection	2.260	2.136	2.371	2.238
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	13.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.115

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	33	23	137	22	25	203
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	7	0	0	7	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	41	23	140	29	26	207
Peak Hour Factor	0.7420	0.7420	0.7420	0.7420	0.7420	0.7420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	8	47	10	9	70
Total Analysis Volume [veh/h]	55	31	189	39	35	279
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.04	0.00	0.00	0.03	0.00
d_M, Delay for Movement [s/veh]	13.64	10.43	0.00	0.00	7.73	0.00
Movement LOS	B	B	A	A	A	A
95th-Percentile Queue Length [veh]	0.53	0.53	0.00	0.00	0.90	0.90
95th-Percentile Queue Length [ft]	13.30	13.30	0.00	0.00	22.53	22.53
d_A, Approach Delay [s/veh]	12.49		0.00		0.86	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	2.14					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	15.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.691

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	30	273	43	32	185	94	37	109	28	27	67	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	2	0	4	0	0	0	0	3	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	284	46	33	193	96	38	111	29	31	68	27
Peak Hour Factor	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	84	14	10	57	28	11	33	9	9	20	8
Total Analysis Volume [veh/h]	37	336	54	39	228	113	45	131	34	37	80	32
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	618	555	633	557	543
Degree of Utilization, x	0.69	0.48	0.18	0.38	0.27

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	5.46	2.59	0.65	1.75	1.11
95th-Percentile Queue Length [ft]	136.40	64.75	16.16	43.67	27.71
Approach Delay [s/veh]	20.80	13.42		13.33	12.11
Approach LOS	C	B		B	B
Intersection Delay [s/veh]	15.94				
Intersection LOS	C				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.576

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	25	224	50	19	169	37	77	105	79	28	46	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	0	0	6	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	236	51	19	178	38	79	107	81	29	47	13
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	59	13	5	45	10	20	27	20	7	12	3
Total Analysis Volume [veh/h]	26	236	51	19	178	38	79	107	81	29	47	13
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.18	0.18	0.01	0.14	0.14	0.05	0.17	0.17	0.02	0.06	0.06
Intersection LOS	A											
Intersection V/C	0.576											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	10.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.524

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	41	113	37	72	119	99	114	1356	49	56	1037	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	2	4	0	0	10	0	0	17	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	42	121	38	75	125	101	116	1393	50	57	1075	61
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	32	10	20	33	26	30	365	13	15	281	16
Total Analysis Volume [veh/h]	44	127	40	79	131	106	121	1459	52	60	1126	64
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	35.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	32	0	0	32	0	0	48	0	0	48	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	18	18	54	54	54	54	54	54
g / C, Green / Cycle	0.22	0.22	0.68	0.68	0.68	0.68	0.68	0.68
(v / s)_i Volume / Saturation Flow Rate	0.13	0.20	0.25	0.28	0.28	0.17	0.22	0.22
s, saturation flow rate [veh/h]	1590	1612	478	3618	1867	352	3618	1848
c, Capacity [veh/h]	403	410	361	2462	1270	278	2462	1258
d1, Uniform Delay [s]	27.60	30.13	10.06	5.64	5.64	10.46	5.22	5.22
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.05	3.09	2.49	0.50	0.96	1.77	0.34	0.67
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.52	0.77	0.34	0.40	0.40	0.22	0.32	0.32
d, Delay for Lane Group [s/veh]	28.65	33.22	12.55	6.13	6.60	12.23	5.56	5.89
Lane Group LOS	C	C	B	A	A	B	A	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh]	3.58	6.02	1.35	3.08	3.35	0.68	2.25	2.42
50th-Percentile Queue Length [ft]	89.47	150.45	33.66	77.10	83.69	16.96	56.25	60.38
95th-Percentile Queue Length [veh]	6.44	10.04	2.42	5.55	6.03	1.22	4.05	4.35
95th-Percentile Queue Length [ft]	161.05	251.03	60.59	138.78	150.64	30.53	101.25	108.69

Movement, Approach, & Intersection Results

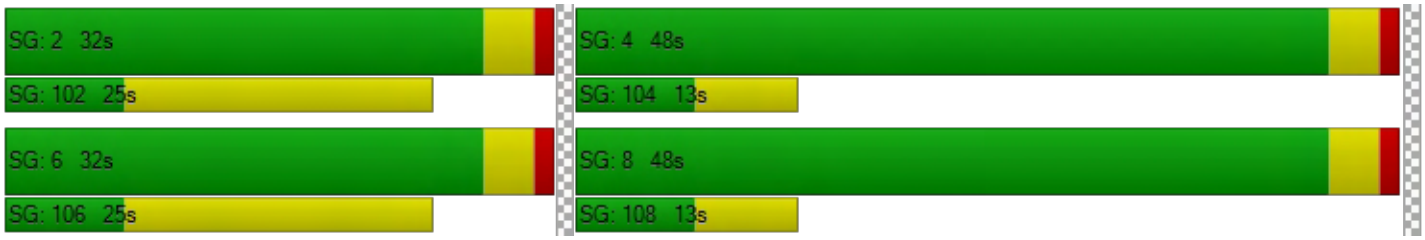
d_M, Delay for Movement [s/veh]	28.65	28.65	28.65	33.22	33.22	33.22	12.55	6.28	6.60	12.23	5.66	5.89
Movement LOS	C	C	C	C	C	C	B	A	A	B	A	A
d_A, Approach Delay [s/veh]	28.65			33.22			6.75			5.99		
Approach LOS	C			C			A			A		
d_I, Intersection Delay [s/veh]	10.28											
Intersection LOS	B											
Intersection V/C	0.524											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.015	2.310	3.055	3.094
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	700	700	1100	1100
d_b, Bicycle Delay [s]	16.90	16.90	8.10	8.10
l_b,int, Bicycle LOS Score for Intersection	1.908	2.081	2.457	2.247
Bicycle LOS	A	B	B	B

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.566

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	12	842	8	105	952	52	76	34	23	7	15	94
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	24	0	3	14	0	0	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	883	8	110	985	53	78	35	23	7	15	101
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	221	2	28	246	13	20	9	6	2	4	25
Total Analysis Volume [veh/h]	12	883	8	110	985	53	78	35	23	7	15	101
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.28	0.01	0.07	0.31	0.03	0.05	0.07	0.01	0.00	0.07	0.07
Intersection LOS	A											
Intersection V/C	0.566											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.489

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	9	839	12	8	965	13	4	2	45	14	3	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	19	0	3	11	0	0	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	875	12	11	995	13	4	2	46	14	3	44
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	219	3	3	249	3	1	1	12	4	1	11
Total Analysis Volume [veh/h]	9	875	12	11	995	13	4	2	46	14	3	44
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.28	0.28	0.01	0.32	0.32	0.00	0.03	0.03	0.01	0.04	0.04
Intersection LOS	A											
Intersection V/C	0.489											

Opening Year (2020) With Project

Signal Hill Business Park

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Report File: Z:\...\School PM - OYP.pdf

Scenario 4 Opening Year With Project
3/6/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Thru	0.703	-	C
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.580	21.1	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.231	15.5	C
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.850	22.2	C
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	NB Thru	0.591	-	A
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	SB Right	0.586	12.1	B
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	SB Thru	0.573	-	A
19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	SB Right	0.489	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.703

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	20	16	5	11	3	0	3	8	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	598	45	46	580	45	70	82	42	65	141	94
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	150	11	12	145	11	18	21	11	16	35	24
Total Analysis Volume [veh/h]	50	598	45	46	580	45	70	82	42	65	141	94
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.40	0.40	0.03	0.39	0.39	0.04	0.10	0.03	0.04	0.13	0.06
Intersection LOS	C											
Intersection V/C	0.703											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	21.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.580

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	92	444	251	86	425	124	99	1163	93	168	841	130
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	2	0	6	13	18	22	0	7	50	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	94	461	258	88	440	139	119	1208	95	178	908	133
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	121	68	23	115	36	31	316	25	47	238	35
Total Analysis Volume [veh/h]	98	483	270	92	461	146	125	1265	99	186	951	139
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	13	33	0	16	36	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	37	22	22	22	7	35	35	11	39	39
g / C, Green / Cycle	0.27	0.27	0.46	0.27	0.27	0.27	0.09	0.44	0.44	0.14	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.10	0.13	0.17	0.10	0.13	0.09	0.07	0.25	0.25	0.10	0.20	0.20
s, saturation flow rate [veh/h]	946	3618	1615	927	3618	1615	1810	3618	1830	1810	3618	1779
c, Capacity [veh/h]	223	988	750	215	988	441	164	1576	797	256	1761	866
d1, Uniform Delay [s]	33.03	24.45	13.80	33.32	24.28	23.29	35.63	17.03	17.03	32.92	13.23	13.23
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.36	0.38	0.29	1.35	0.34	0.44	7.21	1.53	3.00	3.90	0.72	1.47
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.44	0.49	0.36	0.43	0.47	0.33	0.76	0.57	0.57	0.73	0.41	0.42
d, Delay for Lane Group [s/veh]	34.39	24.82	14.09	34.68	24.62	23.72	42.84	18.56	20.03	36.83	13.95	14.70
Lane Group LOS	C	C	B	C	C	C	D	B	C	D	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	1.83	3.68	2.91	1.75	3.55	2.18	2.63	6.05	6.44	3.60	3.98	4.10
50th-Percentile Queue Length [ft]	45.79	92.10	72.80	43.74	88.74	54.54	65.75	151.13	161.07	89.91	99.53	102.47
95th-Percentile Queue Length [veh]	3.30	6.63	5.24	3.15	6.39	3.93	4.73	10.08	10.61	6.47	7.17	7.38
95th-Percentile Queue Length [ft]	82.43	165.78	131.05	78.74	159.74	98.17	118.35	251.93	265.14	161.84	179.16	184.45

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.39	24.82	14.09	34.68	24.62	23.72	42.84	18.98	20.03	36.83	14.12	14.70
Movement LOS	C	C	B	C	C	C	D	B	C	D	B	B
d_A, Approach Delay [s/veh]	22.52			25.76			21.05			17.49		
Approach LOS	C			C			C			B		
d_I, Intersection Delay [s/veh]	21.05											
Intersection LOS	C											
Intersection V/C	0.580											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.749	2.681	3.163	3.190
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	675	675	725	800
d_b, Bicycle Delay [s]	17.56	17.56	16.26	14.40
l_b,int, Bicycle LOS Score for Intersection	2.262	2.136	2.379	2.261
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	15.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.231

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	33	23	137	22	25	203
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	44	0	6	20	0	16
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	78	23	146	42	26	223
Peak Hour Factor	0.7420	0.7420	0.7420	0.7420	0.7420	0.7420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	8	49	14	9	75
Total Analysis Volume [veh/h]	105	31	197	57	35	301
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.23	0.04	0.00	0.00	0.03	0.00
d_M, Delay for Movement [s/veh]	15.52	11.99	0.00	0.00	7.80	0.00
Movement LOS	C	B	A	A	A	A
95th-Percentile Queue Length [veh]	1.08	1.08	0.00	0.00	1.01	1.01
95th-Percentile Queue Length [ft]	26.95	26.95	0.00	0.00	25.33	25.33
d_A, Approach Delay [s/veh]	14.71		0.00		0.81	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	3.13					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	22.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.850

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	30	273	43	32	185	94	37	109	28	27	67	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	13	48	0	6	0	0	0	6	19	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	47	291	92	33	195	96	38	111	35	47	68	27
Peak Hour Factor	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	86	27	10	58	28	11	33	10	14	20	8
Total Analysis Volume [veh/h]	56	344	109	39	230	113	45	131	41	56	80	32
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	599	525	593	522	508
Degree of Utilization, x	0.85	0.51	0.19	0.42	0.33

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	9.31	2.90	0.70	2.03	1.43
95th-Percentile Queue Length [ft]	232.68	72.38	17.46	50.66	35.86
Approach Delay [s/veh]	33.95	14.68		14.71	13.55
Approach LOS	D	B		B	B
Intersection Delay [s/veh]	22.22				
Intersection LOS	C				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.591

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	25	224	50	19	169	37	77	105	79	28	46	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	31	0	0	71	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	259	51	19	243	38	79	107	81	29	47	13
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	65	13	5	61	10	20	27	20	7	12	3
Total Analysis Volume [veh/h]	26	259	51	19	243	38	79	107	81	29	47	13
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.19	0.19	0.01	0.18	0.18	0.05	0.17	0.17	0.02	0.06	0.06
Intersection LOS	A											
Intersection V/C	0.591											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	12.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.586

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	41	113	37	72	119	99	114	1356	49	56	1037	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	27	4	40	14	10	0	0	17	11
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	42	121	38	100	125	141	130	1393	50	57	1075	70
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	32	10	26	33	37	34	365	13	15	281	18
Total Analysis Volume [veh/h]	44	127	40	105	131	148	136	1459	52	60	1126	73
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	35.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	36	0	0	36	0	0	44	0	0	44	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	51	51	51	51	51	51
g / C, Green / Cycle	0.27	0.27	0.63	0.63	0.63	0.63	0.63	0.63
(v / s)_i Volume / Saturation Flow Rate	0.13	0.24	0.29	0.28	0.28	0.17	0.22	0.22
s, saturation flow rate [veh/h]	1573	1597	474	3618	1867	352	3618	1841
c, Capacity [veh/h]	471	480	331	2297	1186	256	2297	1169
d1, Uniform Delay [s]	24.41	28.26	13.60	7.35	7.35	13.45	6.82	6.82
k, delay calibration	0.11	0.16	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.67	4.54	3.75	0.60	1.16	2.14	0.41	0.81
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.45	0.80	0.41	0.43	0.43	0.23	0.35	0.35
d, Delay for Lane Group [s/veh]	25.08	32.79	17.35	7.95	8.51	15.59	7.23	7.63
Lane Group LOS	C	C	B	A	A	B	A	A
Critical Lane Group	No	Yes	Yes	No	No	No	No	No
50th-Percentile Queue Length [veh]	3.29	7.38	1.88	3.79	4.10	0.79	2.80	2.98
50th-Percentile Queue Length [ft]	82.24	184.51	47.08	94.78	102.46	19.83	69.90	74.45
95th-Percentile Queue Length [veh]	5.92	11.84	3.39	6.82	7.38	1.43	5.03	5.36
95th-Percentile Queue Length [ft]	148.04	295.90	84.74	170.60	184.42	35.70	125.82	134.01

Movement, Approach, & Intersection Results

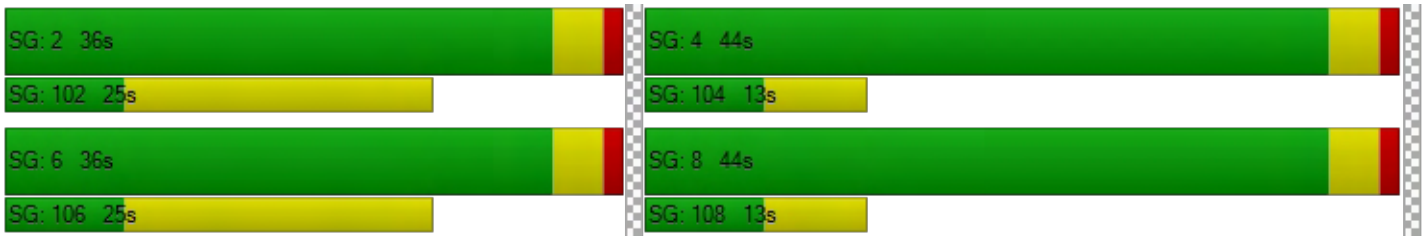
d_M, Delay for Movement [s/veh]	25.08	25.08	25.08	32.79	32.79	32.79	17.35	8.12	8.51	15.59	7.35	7.63
Movement LOS	C	C	C	C	C	C	B	A	A	B	A	A
d_A, Approach Delay [s/veh]	25.08			32.79			8.90			7.76		
Approach LOS	C			C			A			A		
d_I, Intersection Delay [s/veh]	12.09											
Intersection LOS	B											
Intersection V/C	0.586											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.015	2.361	3.063	3.135
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	800	800	1000	1000
d_b, Bicycle Delay [s]	14.40	14.40	10.00	10.00
l_b,int, Bicycle LOS Score for Intersection	1.908	2.193	2.465	2.252
Bicycle LOS	A	B	B	B

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.573

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	12	842	8	105	952	52	76	34	23	7	15	94
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	24	0	3	14	4	12	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	883	8	110	985	57	90	35	23	7	15	101
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	221	2	28	246	14	23	9	6	2	4	25
Total Analysis Volume [veh/h]	12	883	8	110	985	57	90	35	23	7	15	101
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.28	0.01	0.07	0.31	0.04	0.06	0.08	0.01	0.00	0.07	0.07
Intersection LOS	A											
Intersection V/C	0.573											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.489

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	9	839	12	8	965	13	4	2	45	14	3	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	19	0	3	11	0	0	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	875	12	11	995	13	4	2	46	14	3	44
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	219	3	3	249	3	1	1	12	4	1	11
Total Analysis Volume [veh/h]	9	875	12	11	995	13	4	2	46	14	3	44
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.28	0.28	0.01	0.32	0.32	0.00	0.03	0.03	0.01	0.04	0.04
Intersection LOS	A											
Intersection V/C	0.489											

General Plan Buildout Without Project

Signal Hill Business Park

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Report File: Z:\...\School PM - GP.pdf

Scenario 5 General Plan Buildout Without Project
3/6/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Thru	0.802	-	D
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.681	24.0	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.153	15.6	C
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.929	29.1	D
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	NB Right	0.648	-	B
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	SB Thru	0.689	12.7	B
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	SB Thru	0.655	-	B
19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	SB Thru	0.564	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.802

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	3	16	5	11	1	0	3	1	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	711	53	34	691	53	82	95	50	77	160	58
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	178	13	9	173	13	21	24	13	19	40	15
Total Analysis Volume [veh/h]	60	711	53	34	691	53	82	95	50	77	160	58
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.48	0.48	0.02	0.47	0.47	0.05	0.11	0.03	0.05	0.15	0.04
Intersection LOS	D											
Intersection V/C	0.802											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	24.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.681

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	92	444	251	86	425	124	99	1163	93	168	841	130
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	0	0	6	13	18	10	0	0	17	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	112	550	306	105	525	164	139	1429	113	205	1043	159
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	144	80	27	137	43	36	374	30	54	273	42
Total Analysis Volume [veh/h]	117	576	320	110	550	172	146	1496	118	215	1092	166
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	13	33	0	16	36	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	25	25	41	25	25	25	8	31	31	12	35	35
g / C, Green / Cycle	0.31	0.31	0.51	0.31	0.31	0.31	0.10	0.39	0.39	0.15	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.13	0.16	0.20	0.13	0.15	0.11	0.08	0.30	0.30	0.12	0.23	0.23
s, saturation flow rate [veh/h]	871	3618	1615	850	3618	1615	1810	3618	1830	1810	3618	1774
c, Capacity [veh/h]	237	1141	831	228	1141	509	185	1396	706	270	1565	768
d1, Uniform Delay [s]	31.95	22.34	11.79	32.30	22.15	21.02	35.15	21.48	21.49	32.95	16.83	16.83
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.58	0.35	0.29	1.58	0.32	0.39	7.32	4.09	7.87	5.37	1.34	2.71
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.49	0.50	0.39	0.48	0.48	0.34	0.79	0.77	0.77	0.80	0.54	0.54
d, Delay for Lane Group [s/veh]	33.53	22.69	12.08	33.88	22.47	21.41	42.46	25.57	29.37	38.31	18.17	19.54
Lane Group LOS	C	C	B	C	C	C	D	C	C	D	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	2.18	4.21	3.15	2.09	4.06	2.43	3.06	8.81	9.67	4.26	5.50	5.69
50th-Percentile Queue Length [ft]	54.60	105.30	78.64	52.31	101.49	60.87	76.43	220.25	241.78	106.57	137.62	142.32
95th-Percentile Queue Length [veh]	3.93	7.58	5.66	3.77	7.31	4.38	5.50	13.68	14.77	7.65	9.35	9.61
95th-Percentile Queue Length [ft]	98.29	189.45	141.56	94.16	182.68	109.57	137.58	341.94	369.29	191.22	233.82	240.14

Movement, Approach, & Intersection Results

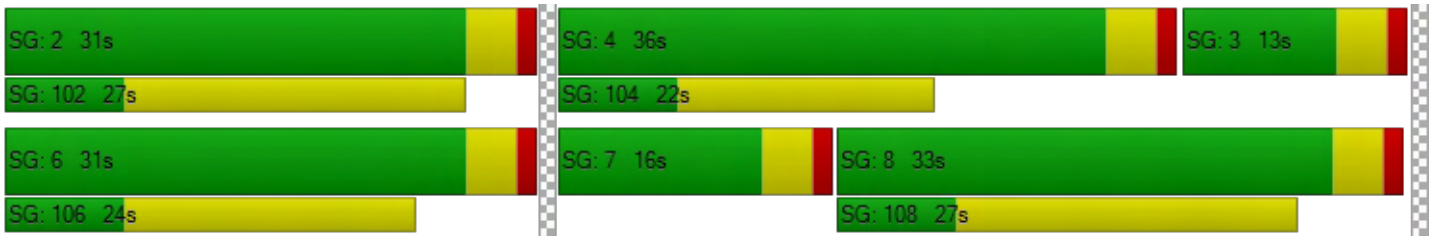
d_M, Delay for Movement [s/veh]	33.53	22.69	12.08	33.88	22.47	21.41	42.46	26.65	29.37	38.31	18.48	19.54
Movement LOS	C	C	B	C	C	C	D	C	C	D	B	B
d_A, Approach Delay [s/veh]	20.59			23.76			28.14			21.49		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	23.99											
Intersection LOS	C											
Intersection V/C	0.681											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.806	2.726	3.264	3.296
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	675	675	725	800
d_b, Bicycle Delay [s]	17.56	17.56	16.26	14.40
l_b,int, Bicycle LOS Score for Intersection	2.395	2.246	2.528	2.370
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	15.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.153

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	33	23	137	22	25	203
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	7	0	0	7	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	47	28	167	34	31	248
Peak Hour Factor	0.7420	0.7420	0.7420	0.7420	0.7420	0.7420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	9	56	11	10	84
Total Analysis Volume [veh/h]	63	38	225	46	42	334
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.15	0.05	0.00	0.00	0.03	0.00
d_M, Delay for Movement [s/veh]	15.56	11.32	0.00	0.00	7.85	0.00
Movement LOS	C	B	A	A	A	A
95th-Percentile Queue Length [veh]	0.74	0.74	0.00	0.00	1.20	1.20
95th-Percentile Queue Length [ft]	18.61	18.61	0.00	0.00	30.07	30.07
d_A, Approach Delay [s/veh]	13.97		0.00		0.88	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	2.33					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	29.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.929

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	30	273	43	32	185	94	37	109	28	27	67	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	2	0	4	0	0	0	0	3	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	37	339	54	39	230	115	45	133	34	36	82	32
Peak Hour Factor	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	100	16	12	68	34	13	39	10	11	24	9
Total Analysis Volume [veh/h]	44	401	64	46	272	136	53	157	40	43	97	38
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	548	492	552	486	468
Degree of Utilization, x	0.93	0.65	0.25	0.51	0.38

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	11.60	4.54	0.96	2.89	1.75
95th-Percentile Queue Length [ft]	289.89	113.38	24.07	72.30	43.78
Approach Delay [s/veh]	48.38	19.10		17.98	15.30
Approach LOS	E	C		C	C
Intersection Delay [s/veh]	29.12				
Intersection LOS	D				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.648

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	25	224	50	19	169	37	77	105	79	28	46	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	0	0	6	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	281	61	23	212	45	94	128	96	34	56	16
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	70	15	6	53	11	24	32	24	9	14	4
Total Analysis Volume [veh/h]	31	281	61	23	212	45	94	128	96	34	56	16
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.21	0.21	0.01	0.16	0.16	0.06	0.20	0.20	0.02	0.07	0.07
Intersection LOS	B											
Intersection V/C	0.648											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	12.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.689

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	41	113	37	72	119	99	114	1356	49	56	1037	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	2	4	0	0	10	0	0	17	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	144	45	90	149	121	139	1664	60	68	1282	73
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	38	12	24	39	32	36	436	16	18	336	19
Total Analysis Volume [veh/h]	52	151	47	94	156	127	146	1742	63	71	1342	76
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	42.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	31	0	0	31	0	0	49	0	0	49	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	51	51	51	51	51	51
g / C, Green / Cycle	0.26	0.26	0.64	0.64	0.64	0.64	0.64	0.64
(v / s)_i Volume / Saturation Flow Rate	0.16	0.24	0.38	0.33	0.33	0.27	0.26	0.26
s, saturation flow rate [veh/h]	1530	1567	385	3618	1866	265	3618	1848
c, Capacity [veh/h]	458	470	277	2301	1187	205	2301	1176
d1, Uniform Delay [s]	25.21	28.39	17.06	7.89	7.90	17.46	7.15	7.15
k, delay calibration	0.11	0.19	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.01	5.49	7.03	0.83	1.62	4.58	0.54	1.05
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.55	0.80	0.53	0.52	0.52	0.35	0.41	0.41
d, Delay for Lane Group [s/veh]	26.22	33.88	24.09	8.73	9.52	22.04	7.69	8.20
Lane Group LOS	C	C	C	A	A	C	A	A
Critical Lane Group	No	Yes	Yes	No	No	No	No	No
50th-Percentile Queue Length [veh]	4.06	7.40	2.55	4.89	5.32	1.20	3.47	3.72
50th-Percentile Queue Length [ft]	101.50	185.06	63.85	122.20	132.91	30.01	86.87	92.96
95th-Percentile Queue Length [veh]	7.31	11.86	4.60	8.51	9.10	2.16	6.25	6.69
95th-Percentile Queue Length [ft]	182.71	296.61	114.93	212.85	227.44	54.02	156.37	167.32

Movement, Approach, & Intersection Results

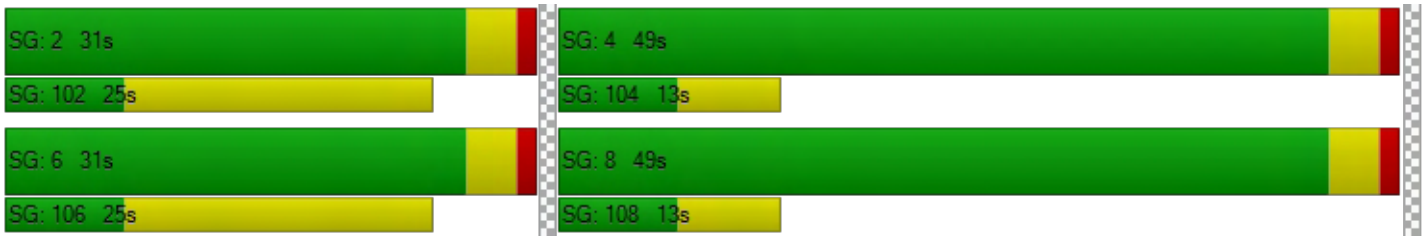
d_M, Delay for Movement [s/veh]	26.22	26.22	26.22	33.88	33.88	33.88	24.09	8.98	9.52	22.04	7.84	8.20
Movement LOS	C	C	C	C	C	C	C	A	A	C	A	A
d_A, Approach Delay [s/veh]	26.22			33.88			10.13			8.54		
Approach LOS	C			C			B			A		
d_I, Intersection Delay [s/veh]	12.74											
Intersection LOS	B											
Intersection V/C	0.689											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.072	2.385	3.145	3.191
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	675	675	1125	1125
d_b, Bicycle Delay [s]	17.56	17.56	7.66	7.66
l_b,int, Bicycle LOS Score for Intersection	1.972	2.182	2.633	2.379
Bicycle LOS	A	B	B	B

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.655

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	12	842	8	105	952	52	76	34	23	7	15	94
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	24	0	3	14	0	0	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	1051	10	131	1175	63	93	41	28	9	18	120
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	263	3	33	294	16	23	10	7	2	5	30
Total Analysis Volume [veh/h]	15	1051	10	131	1175	63	93	41	28	9	18	120
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.33	0.01	0.08	0.37	0.04	0.06	0.08	0.02	0.01	0.09	0.09
Intersection LOS	B											
Intersection V/C	0.655											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.564

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	9	839	12	8	965	13	4	2	45	14	3	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	19	0	3	11	0	0	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	1043	15	13	1188	16	5	2	55	17	4	51
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	261	4	3	297	4	1	1	14	4	1	13
Total Analysis Volume [veh/h]	11	1043	15	13	1188	16	5	2	55	17	4	51
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.33	0.33	0.01	0.38	0.38	0.00	0.04	0.04	0.01	0.05	0.05
Intersection LOS	A											
Intersection V/C	0.564											

General Plan Buildout With Project

Signal Hill Business Park

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Report File: Z:\...\School PM - GPP.pdf

Scenario 6 General Plan Buildout With Project
3/6/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Thru	0.813	-	D
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.690	24.2	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.290	18.3	C
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	NB Thru	1.101	48.6	E
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	NB Thru	0.663	-	B
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	SB Right	0.784	15.2	B
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	SB Thru	0.662	-	B
19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	SB Thru	0.564	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.813

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	20	16	5	11	3	0	3	8	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	711	53	51	691	53	82	97	50	77	167	103
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	178	13	13	173	13	21	24	13	19	42	26
Total Analysis Volume [veh/h]	60	711	53	51	691	53	82	97	50	77	167	103
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.48	0.48	0.03	0.47	0.47	0.05	0.11	0.03	0.05	0.15	0.06
Intersection LOS	D											
Intersection V/C	0.813											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	24.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.690

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	92	444	251	86	425	124	99	1163	93	168	841	130
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	2	0	6	13	18	22	0	7	50	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	112	550	308	105	525	164	139	1441	113	212	1076	159
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	144	81	27	137	43	36	377	30	55	282	42
Total Analysis Volume [veh/h]	117	576	323	110	550	172	146	1509	118	222	1127	166
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	13	33	0	16	36	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	25	25	41	25	25	25	8	31	31	12	35	35
g / C, Green / Cycle	0.31	0.31	0.51	0.31	0.31	0.31	0.10	0.39	0.39	0.15	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.13	0.16	0.20	0.13	0.15	0.11	0.08	0.30	0.30	0.12	0.24	0.24
s, saturation flow rate [veh/h]	871	3618	1615	850	3618	1615	1810	3618	1830	1810	3618	1778
c, Capacity [veh/h]	237	1141	833	228	1141	510	185	1392	704	272	1565	769
d1, Uniform Delay [s]	31.94	22.34	11.76	32.30	22.15	21.02	35.15	21.63	21.65	33.00	16.97	16.97
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.58	0.35	0.30	1.58	0.32	0.39	7.32	4.30	8.24	5.96	1.42	2.87
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.49	0.50	0.39	0.48	0.48	0.34	0.79	0.78	0.78	0.82	0.55	0.55
d, Delay for Lane Group [s/veh]	33.52	22.69	12.06	33.88	22.47	21.41	42.46	25.93	29.89	38.96	18.39	19.84
Lane Group LOS	C	C	B	C	C	C	D	C	C	D	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	2.18	4.21	3.17	2.09	4.06	2.43	3.06	8.96	9.86	4.45	5.71	5.92
50th-Percentile Queue Length [ft]	54.60	105.29	79.30	52.31	101.48	60.87	76.43	223.94	246.40	111.18	142.73	148.03
95th-Percentile Queue Length [veh]	3.93	7.58	5.71	3.77	7.31	4.38	5.50	13.87	15.00	7.91	9.63	9.91
95th-Percentile Queue Length [ft]	98.28	189.44	142.75	94.16	182.66	109.56	137.58	346.65	375.12	197.65	240.69	247.79

Movement, Approach, & Intersection Results

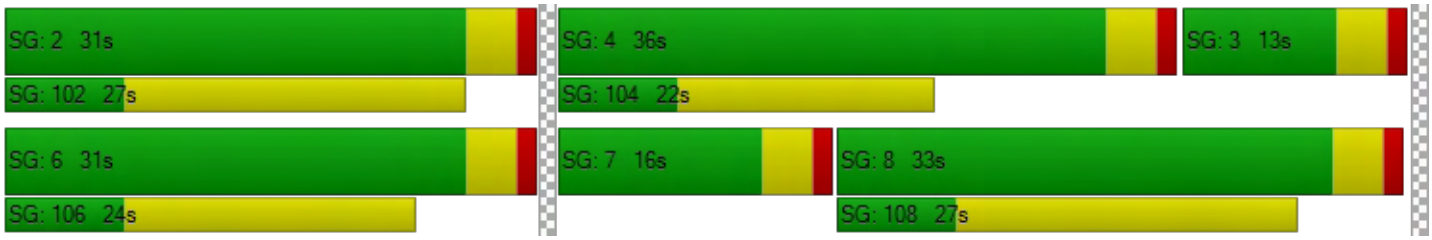
d_M, Delay for Movement [s/veh]	33.52	22.69	12.06	33.88	22.47	21.41	42.46	27.06	29.89	38.96	18.72	19.84
Movement LOS	C	C	B	C	C	C	D	C	C	D	B	B
d_A, Approach Delay [s/veh]	20.56			23.76			28.51			21.81		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	24.19											
Intersection LOS	C											
Intersection V/C	0.690											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.808	2.726	3.272	3.306
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	675	675	725	800
d_b, Bicycle Delay [s]	17.56	17.56	16.26	14.40
l_b,int, Bicycle LOS Score for Intersection	2.398	2.246	2.535	2.393
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	18.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.290

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	33	23	137	22	25	203
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	44	0	6	20	0	16
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	84	28	173	47	31	264
Peak Hour Factor	0.7420	0.7420	0.7420	0.7420	0.7420	0.7420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	9	58	16	10	89
Total Analysis Volume [veh/h]	113	38	233	63	42	356
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.29	0.05	0.00	0.00	0.03	0.00
d_M, Delay for Movement [s/veh]	18.33	13.71	0.00	0.00	7.92	0.00
Movement LOS	C	B	A	A	A	A
95th-Percentile Queue Length [veh]	1.48	1.48	0.00	0.00	1.34	1.34
95th-Percentile Queue Length [ft]	36.97	36.97	0.00	0.00	33.55	33.55
d_A, Approach Delay [s/veh]	17.17		0.00		0.84	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	3.46					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	48.6
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.101

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	30	273	43	32	185	94	37	109	28	27	67	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	13	48	0	6	0	0	0	6	19	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	53	346	100	39	232	115	45	133	40	52	82	32
Peak Hour Factor	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	102	30	12	69	34	13	39	12	15	24	9
Total Analysis Volume [veh/h]	63	409	118	46	274	136	53	157	47	61	97	38
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	590	484	540	478	463
Degree of Utilization, x	1.10	0.66	0.25	0.54	0.42

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	18.62	4.77	0.99	3.12	2.08
95th-Percentile Queue Length [ft]	465.60	119.16	24.81	78.10	51.92
Approach Delay [s/veh]	94.32	20.00		18.89	16.39
Approach LOS	F	C		C	C
Intersection Delay [s/veh]	48.59				
Intersection LOS	E				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.663

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	25	224	50	19	169	37	77	105	79	28	46	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	31	0	0	71	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	304	61	23	277	45	94	128	96	34	56	16
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	76	15	6	69	11	24	32	24	9	14	4
Total Analysis Volume [veh/h]	31	304	61	23	277	45	94	128	96	34	56	16
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.23	0.23	0.01	0.20	0.20	0.06	0.20	0.20	0.02	0.07	0.07
Intersection LOS	B											
Intersection V/C	0.663											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	15.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.784

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	41	113	37	72	119	99	114	1356	49	56	1037	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	27	4	40	14	10	0	0	17	11
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	144	45	115	149	161	153	1664	60	68	1282	82
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	38	12	30	39	42	40	436	16	18	336	21
Total Analysis Volume [veh/h]	52	151	47	120	156	169	160	1742	63	71	1342	86
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	44.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	33	0	0	33	0	0	47	0	0	47	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	25	25	47	47	47	47	47	47
g / C, Green / Cycle	0.31	0.31	0.59	0.59	0.59	0.59	0.59	0.59
(v / s)_i Volume / Saturation Flow Rate	0.17	0.29	0.42	0.33	0.33	0.27	0.26	0.26
s, saturation flow rate [veh/h]	1511	1557	381	3618	1866	265	3618	1842
c, Capacity [veh/h]	519	536	252	2144	1106	188	2144	1092
d1, Uniform Delay [s]	22.23	26.73	22.76	9.88	9.89	21.67	8.98	8.98
k, delay calibration	0.11	0.28	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.70	8.22	11.59	1.04	2.02	5.69	0.66	1.30
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.48	0.83	0.63	0.55	0.56	0.38	0.44	0.44
d, Delay for Lane Group [s/veh]	22.93	34.95	34.35	10.92	11.91	27.37	9.64	10.27
Lane Group LOS	C	C	C	B	B	C	A	B
Critical Lane Group	No	Yes	Yes	No	No	No	No	No
50th-Percentile Queue Length [veh]	3.71	9.00	3.54	5.79	6.29	1.38	4.16	4.43
50th-Percentile Queue Length [ft]	92.80	224.97	88.55	144.72	157.28	34.42	103.91	110.63
95th-Percentile Queue Length [veh]	6.68	13.92	6.38	9.73	10.40	2.48	7.48	7.88
95th-Percentile Queue Length [ft]	167.04	347.96	159.38	243.37	260.12	61.95	187.04	196.88

Movement, Approach, & Intersection Results

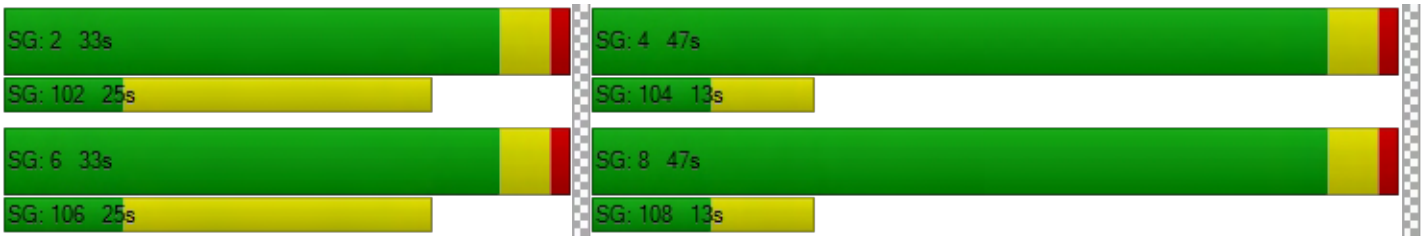
d_M, Delay for Movement [s/veh]	22.93	22.93	22.93	34.95	34.95	34.95	34.35	11.23	11.91	27.37	9.83	10.27
Movement LOS	C	C	C	C	C	C	C	B	B	C	A	B
d_A, Approach Delay [s/veh]	22.93			34.95			13.14			10.68		
Approach LOS	C			C			B			B		
d_I, Intersection Delay [s/veh]	15.18											
Intersection LOS	B											
Intersection V/C	0.784											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.072	2.435	3.153	3.233
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	725	725	1075	1075
d_b, Bicycle Delay [s]	16.26	16.26	8.56	8.56
l_b,int, Bicycle LOS Score for Intersection	1.972	2.294	2.640	2.384
Bicycle LOS	A	B	B	B

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.662

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	12	842	8	105	952	52	76	34	23	7	15	94
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	24	0	3	14	4	12	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	1051	10	131	1175	67	105	41	28	9	18	120
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	263	3	33	294	17	26	10	7	2	5	30
Total Analysis Volume [veh/h]	15	1051	10	131	1175	67	105	41	28	9	18	120
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.33	0.01	0.08	0.37	0.04	0.07	0.09	0.02	0.01	0.09	0.09
Intersection LOS	B											
Intersection V/C	0.662											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.564

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	9	839	12	8	965	13	4	2	45	14	3	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	19	0	3	11	0	0	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	1043	15	13	1188	16	5	2	55	17	4	51
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	261	4	3	297	4	1	1	14	4	1	13
Total Analysis Volume [veh/h]	11	1043	15	13	1188	16	5	2	55	17	4	51
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.33	0.33	0.01	0.38	0.38	0.00	0.04	0.04	0.01	0.05	0.05
Intersection LOS	A											
Intersection V/C	0.564											

APPENDIX D

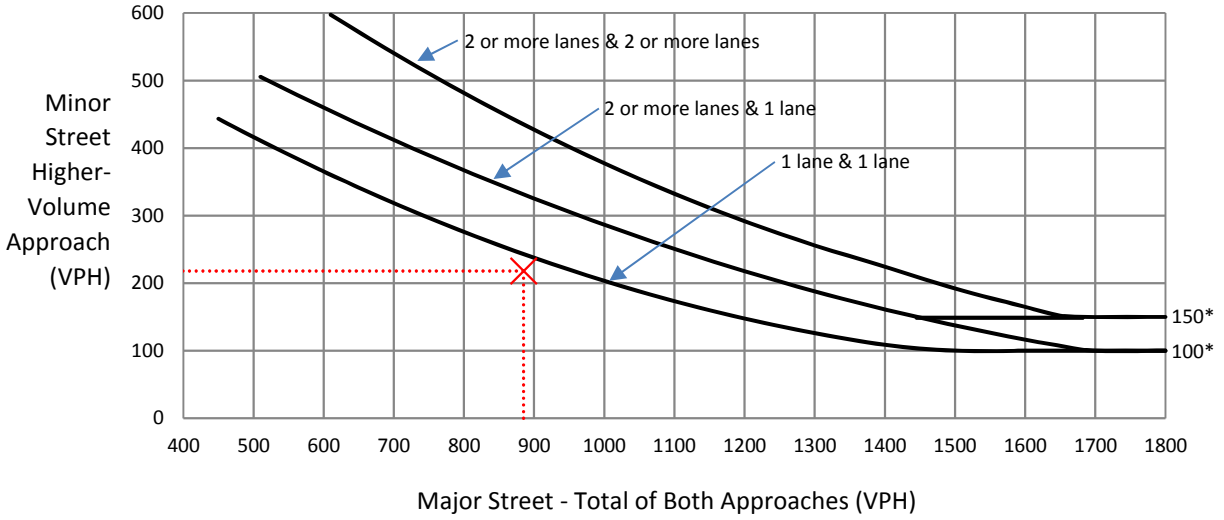
Peak Hour Traffic Signal Warrant Worksheet

Figure C-1

Walnut Ave (NS) / Hill St (EW) - #10
General Plan Buildout With Project
School PM Peak Hour

Major Street:	Walnut Ave	Volume:	885
Minor Street:	Hill St	Volume:	218

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Kunzman Associates, Inc.

OVER 40 YEARS OF EXCELLENT SERVICE

1111 Town & Country Road, Suite 34
Orange, California 92868
(714) 973-8383

www.kainc.us

August 13, 2018

Mr. Steven Christie, Development Manager
XEBEC REALTY PARTNERS
3010 Old Ranch Parkway, Suite 470
Seal Beach, CA 90740

Dear Mr. Christie:

INTRODUCTION

Kunzman Associates, Inc. is pleased to submit this supplemental traffic memorandum regarding our assessment of the potential for cut through traffic resulting from the proposed Signal Hill Business Center project.

This traffic analysis supplements the Signal Hill Business Center Traffic Impact Analysis prepared by Kunzman Associates, Inc. (Revised June 22, 2018). The project site is generally bounded by Gundry Avenue to the west, Gundry Hill Apartments and American University of Health Sciences to the north, Gaviota Avenue to the east, and the Signal Hill City Limits and Alamitos Avenue to the south. The project site is currently vacant. The project site is proposed to consist of developing the project site with a business park consisting of nine buildings totaling 139,080 square feet plus 12,000 square feet of mezzanine, for a total of 151,080 square feet of gross floor area. Full access driveways are proposed at Gundry Avenue, Walnut Avenue, and Alamitos Avenue. The proposed project is anticipated to be constructed and fully operational by Year 2019.

Although this is a technical report, every effort has been made to write the report clearly and concisely. To assist the reader with those terms unique to transportation engineering, a glossary of terms is provided within Appendix A.

POTENTIAL FOR CUT THROUGH TRAFFIC ON GAVIOTA AVENUE

City of Signal Hill staff has reported citizen concerns regarding the potential for cut through traffic on Gaviota Avenue resulting from traffic diversion to avoid congestion at the intersection of Walnut Avenue and Hill Street during peak commute and school hours.

Figure 1 shows the project site plan and proposed access points. As shown on Figure 1, no project access is proposed at Gaviota Avenue.

Figures 2 through 5 show the project trip distribution patterns based on the original trip distribution forecasts contained in the Signal Hill Business Center Traffic Impact Analysis, with the addition of the potential alternative paths if project trips divert to avoid congestion at Walnut Avenue/Hill Street. As

shown on Figures 2 through 5, project trips seeking to avoid the intersection of Walnut Avenue and Hill Street are more likely to use Alamitos Avenue/21st Street or 20th Street based on the location of the proposed project driveway since that is a more direct path to/from Cherry Avenue.

Diverting traffic is not expected to use Gaviota Avenue since that will likely result in longer travel time compared to using Alamitos Avenue/21st Street or 20th Street. For example, a vehicle exiting the project site from Alamitos Avenue and travelling to northbound Cherry Avenue would have to yield to oncoming traffic before turning left on Gaviota, then stop before turning right at Hill Street, whereas staying on Alamitos Avenue/21st Street would not require any yields or stops for the same vehicle to access Cherry Avenue.

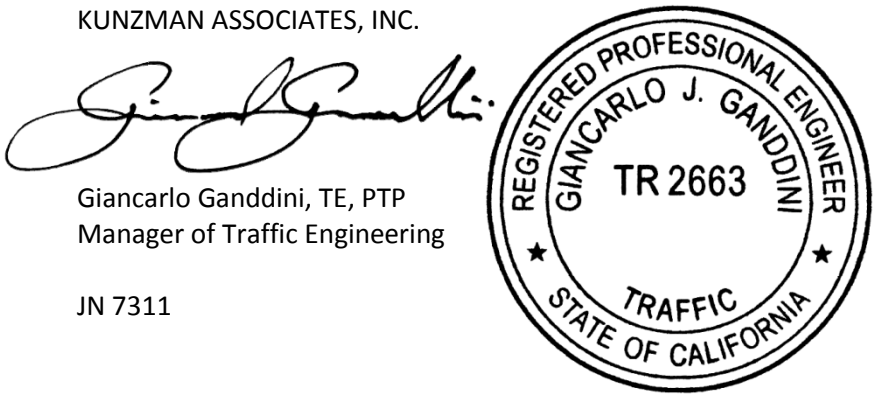
CONCLUSION

If project trips are seeking to avoid the intersection of Walnut Avenue and Hill Street, there are more convenient routes available that do not involve travelling on Gaviota Avenue. Therefore, the project impact of cut through traffic on Gaviota Avenue is expected to be negligible.

Should you have any questions or if we can be of further assistance, please do not hesitate to call at (714) 973-8383.

Respectfully,

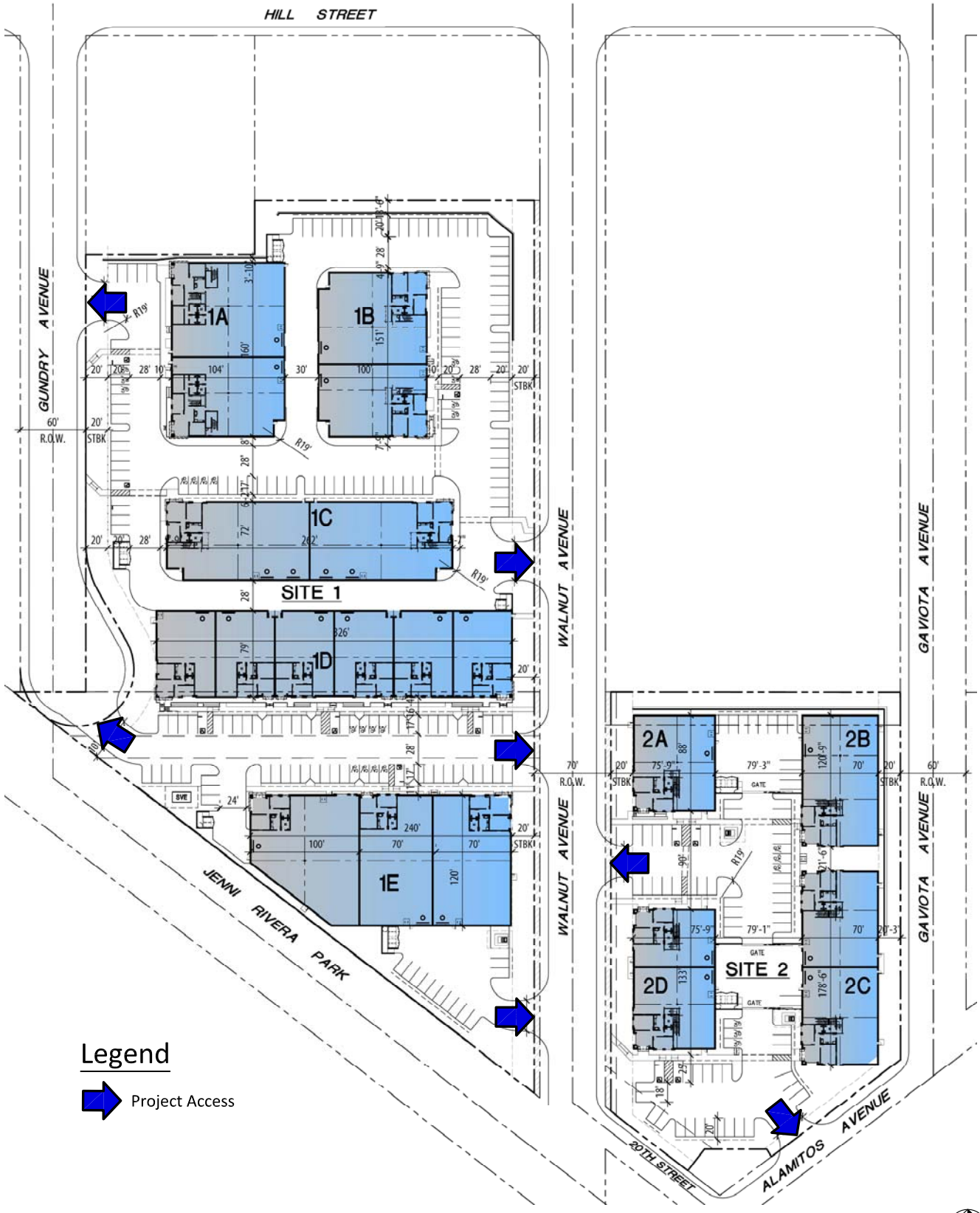
KUNZMAN ASSOCIATES, INC.



Giancarlo Ganddini, TE, PTP
Manager of Traffic Engineering

JN 7311

Figure 1
Site Plan & Access Points



Source: GAA Architects

Figure 2
Project Trip Distribution - Passenger Cars (Outbound)

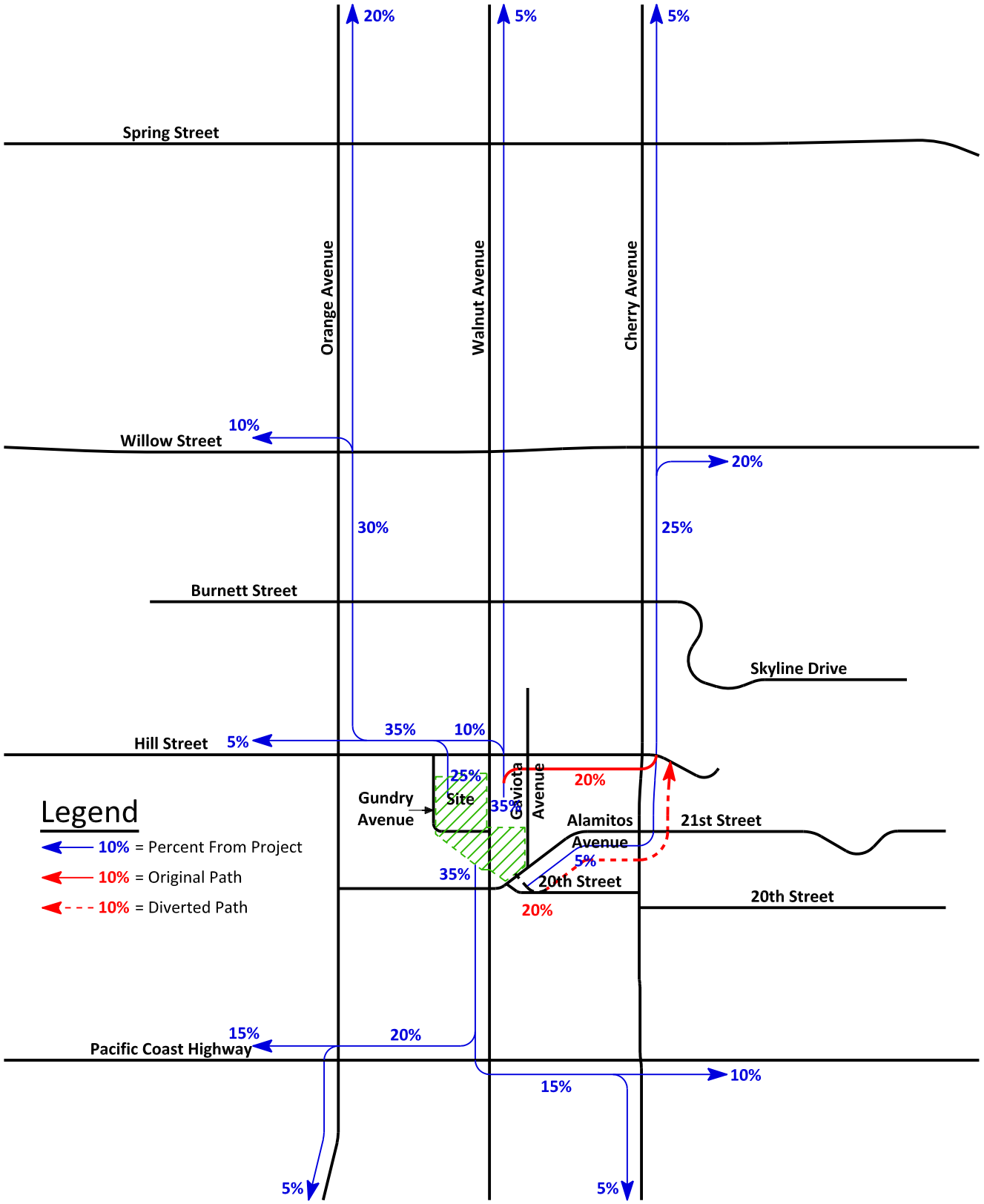


Figure 3
Project Trip Distribution - Passenger Cars (Inbound)

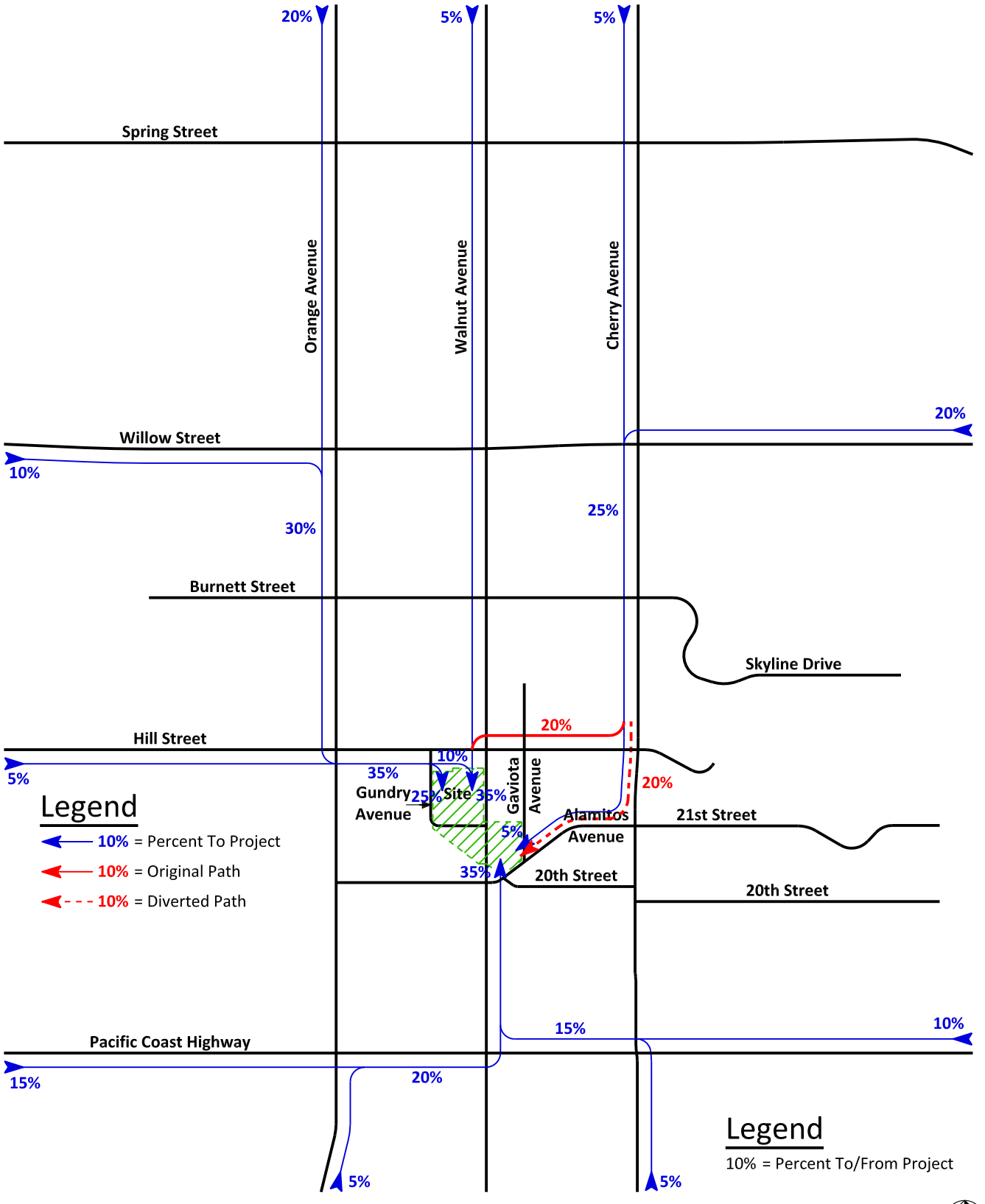


Figure 4
Project Trip Distribution - Trucks (Outbound)

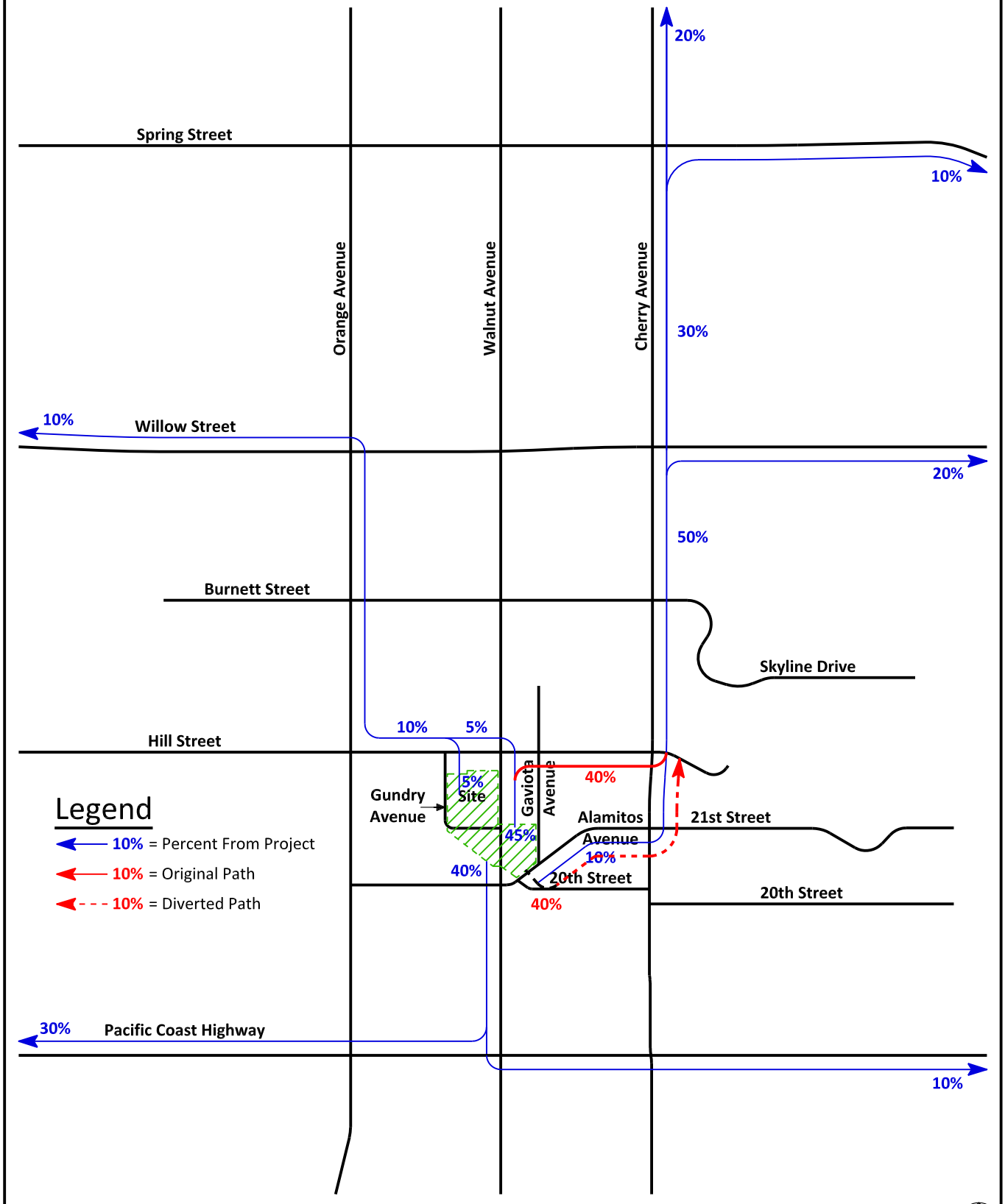
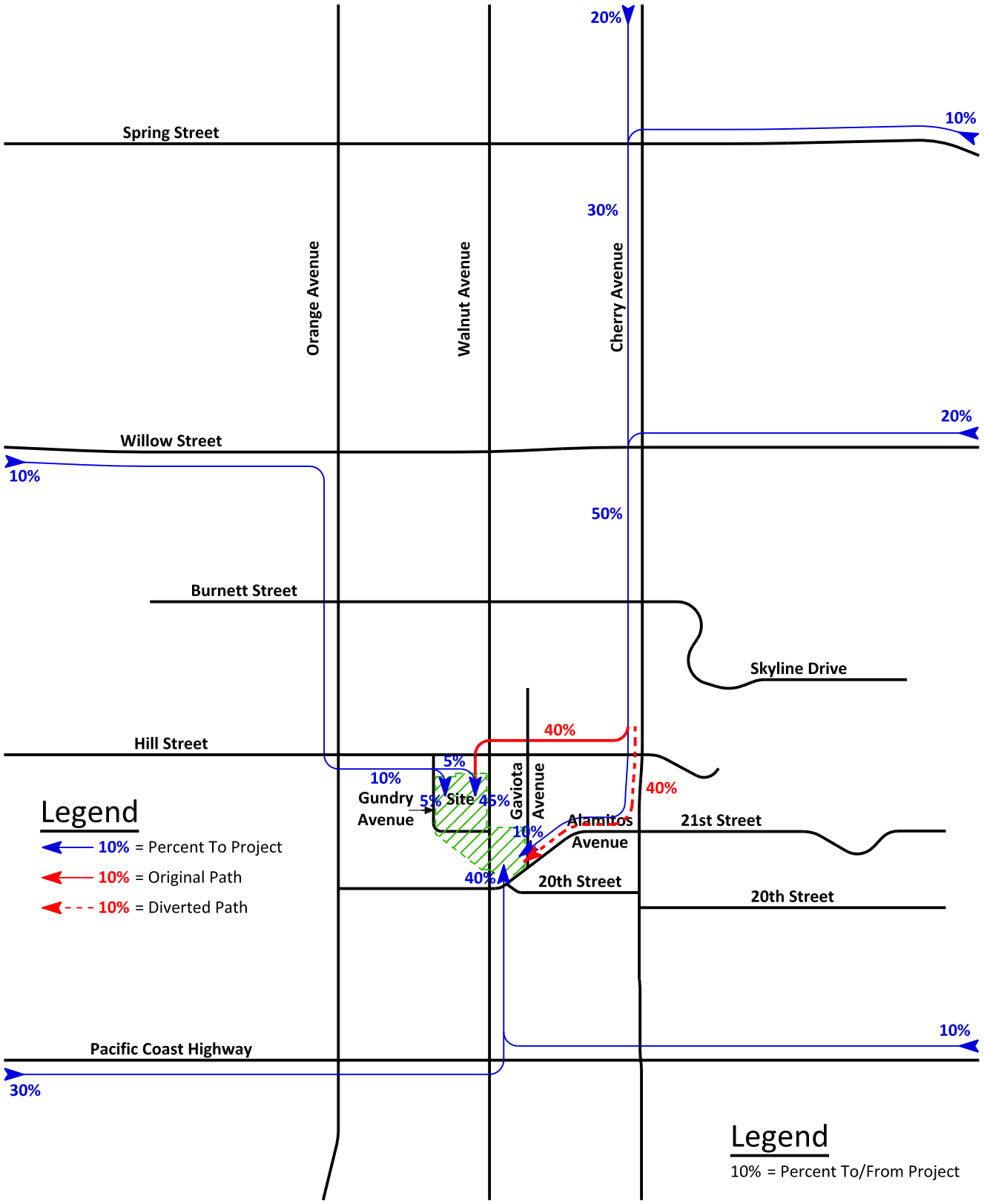


Figure 5
Project Trip Distribution - Trucks (Inbound)



Your Trusted Advisors for
Transportation & Environmental Analysis

September 21, 2018

Mr. Steven Christie, Development Manager
SIGNAL HILL XC, LLC
3010 Old Ranch Parkway, Suite 470
Seal Beach, CA 90740

RE: Signal Hill Business Center Supplemental Traffic Analysis
18-0056

Mr. Steven Christie:

INTRODUCTION

Ganddini Group is pleased to submit this Supplemental Traffic Analysis for the Signal Hill Business Center project. The purpose of this Supplemental Traffic Analysis is to evaluate the potential for additional project traffic impacts based on two additional thresholds not included in the Signal Hill Business Center Traffic Impact Analysis.

This traffic analysis supplements the Signal Hill Business Center Traffic Impact Analysis (Kunzman Associates, Inc., Revised June 22, 2018) ["Project Traffic Impact Analysis"] and the Supplemental Afternoon School Peak Hour Analysis (Kunzman Associates, Inc, May 31, 2018). The project site is generally bounded by Gundry Avenue to the west, Gundry Hill Apartments and American University of Health Sciences to the north, Gaviota Avenue to the east, and the Signal Hill City Limits and Alamitos Avenue to the south. The project site is currently vacant. The proposed project involves developing the project site with a business park consisting of nine buildings totaling 139,080 square feet plus 12,000 square feet of mezzanine, for a total of 151,080 square feet of gross floor area. Full access driveways are proposed at Gundry Avenue, Walnut Avenue, and Alamitos Avenue. The proposed project is anticipated to be constructed and fully operational by Year 2019.

Although this is a technical report, effort has been made to write the report clearly and concisely. To assist the reader with technical terms related to transportation engineering, a glossary is provided in Appendix A.

THRESHOLDS OF SIGNIFICANCE

Per City of Signal Hill traffic study criteria, the intersection mitigation requirement should include (all) following elements:

- Drop of 0.02 (2%) in LOS (ICU); or
- 40 vehicles added to an intersection; or
- Left-turn queue length is greater than the existing storage length.

As requested by City of Signal Hill staff, this Supplemental Traffic Analysis will address the second and third elements (40 vehicles added to an intersection and left-turn queue exceeds existing storage length).

ELEMENT 2 – 40 VEHICLES ADDED TO A STUDY INTERSECTION

Table 1 summarizes the number of project-generated trips forecast to be added at each study intersection within City of Signal Hill jurisdiction during the morning, school afternoon, and evening peak hours. Non-City of Signal Hill intersections are omitted since this threshold only applies to City of Signal Hill. The proposed project is forecast to contribute 40 or more peak hour trips at the following study intersections:

Orange Avenue (NS) at Willow Street (EW) - #2
This signalized intersection is forecast to operate at Level of Service F during the evening peak hour for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

Orange Avenue (NS) at Burnett Street (EW) - #3
This signalized intersection is forecast to operate at Level of Service C during the peak hours for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

Orange Avenue (NS) at Hill Street (EW) - #4
This signalized intersection is forecast to operate at Level of Service D or better during the peak hours for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

Gundry Avenue (NS) at Hill Street (EW) - #6
This unsignalized intersection is forecast to operate at Level of Service C or better during the peak hours for General Plan Buildout Without and With Project conditions. A traffic signal is not forecast to be warranted based on the peak hour volume traffic signal warrant (see Appendix B.)

Proposed Mitigation: N/A

Walnut Avenue (NS) at Hill Street (EW) - #10
This unsignalized intersection is forecast to operate at Level of Service C during the morning/evening peak hours and Level of Service E during the school afternoon peak hour only; however, a traffic signal is not forecast to be warranted (see Appendix B). As previously noted in the Supplemental Afternoon School Peak Hour Analysis (Kunzman Associates, Inc, May 31, 2018), extending the parking restriction on the northbound approach would effectively allow for operation of a right turn lane.

Proposed Mitigation: Extend the no parking restriction on the northbound approach to 100 feet south of the intersection. This will result in the loss of approximately two on-street parking spaces, but will allow for a de facto right turn lane.

Gaviota Avenue (NS) at Hill Street (EW) - #13
This unsignalized intersection is forecast to operate at Level of Service B during the peak hours for General Plan Buildout Without and With Project conditions A traffic signal is not forecast to be warranted based on the peak hour volume traffic signal warrant (see Appendix B.)

Proposed Mitigation: N/A

Cherry Avenue (NS) at Willow Street (EW) - #15
This signalized intersection is forecast to operate at Level of Service F during the evening peak hour for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

Cherry Avenue (NS) at Burnett Street (EW) - #16
This signalized intersection is forecast to operate at Level of Service C during the peak hours for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

Cherry Avenue (NS) at Hill Street (EW) - #17
This signalized intersection is forecast to operate at Level of Service C during the peak hours for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

ELEMENT 3 – LEFT-TURN QUEUE EXCEEDS STORAGE LENGTH

Table 2 summarizes the existing left-turn storage lengths and the corresponding queue length during the morning, school afternoon (where applicable), and evening peak hours for study intersections within City of Signal Hill jurisdiction where the project is forecast to add trips to the left turn movement. Non-City of Signal Hill intersections are omitted since this threshold only applies to City of Signal Hill. The queue length was calculated in accordance with the Highway Capacity Manual, 6th Edition back of queue methodology for the 95th-percentile queue length. Queue worksheets are provided in Appendix C.

As shown in Table 2, adequate left-turn storage is forecast to be provided at the City of Signal Hill study intersections where the proposed project is forecast to increase the left-turn volume during the peak hours for Opening Year (2020) With Project conditions.

As also shown in Table 2, adequate left-turn storage is forecast to be provided at the City of Signal Hill study intersections where the proposed project is forecast to increase the left-turn volume during the peak hours for General Plan Buildout (Year 2040) With Project conditions, with exception of the southbound left turn at Orange Avenue/Hill Street and the westbound left turn at Cherry Avenue/Willow Street.

Orange Avenue (NS) at Hill Street (EW) - #4
Southbound left-turn storage length is forecast to be exceeded during the morning peak hour for General Plan Buildout (Year 2040) With Project conditions. It should be noted that there is additional storage available within the painted median to accommodate the additional queue.

Proposed Mitigation: If necessary, extend the southbound left turn lane striping to provide 250 feet of storage length (including bay taper).

Cherry Avenue (NS) at Willow Street (EW) - #15
Westbound left-turn storage length is forecast to be exceeded during the evening peak hour for General Plan Buildout (Year 2040) With Project conditions. The existing left-turn lane storage is approximately 200 feet for dual left turn lanes plus a left-turn bay taper of approximately 120 feet.

Proposed Mitigation: Modify the westbound raised median to accommodate 250 feet of storage length for dual left turn lanes plus a left-turn bay taper of approximately 120 feet.

FAIR SHARE IMPROVEMENT COSTS

Figure 3 shows a summary of project fair share percentages at each of the intersection improvement locations. Fair share percentages were determined based on the following formula:

$$\text{Project Fair Share} = \text{Improvement Cost} \times \frac{\text{Project Trips}}{\text{New Traffic}\ (\text{Future Traffic} - \text{Existing Traffic})}$$

Table 4 shows the cost estimate for off-site improvements. These cost estimates are intended for informational purposes only and do not imply any legal responsibility or formula for contributions or mitigation. As shown in Table 4, the total project share of estimated off-site improvement costs is $6,016.

SUMMARY

The proposed project should contribute towards updated signal timing at the following study intersections:

- Orange Avenue (NS) at Willow Street (EW) - #2
- Orange Avenue (NS) at Burnett Street (EW) - #3
- Orange Avenue (NS) at Hill Street (EW) - #4
- Cherry Avenue (NS) at Willow Street (EW) - #15
- Cherry Avenue (NS) at Burnett Street (EW) - #16
- Cherry Avenue (NS) at Hill Street (EW) - #17

Additionally, the project should contribute towards its share of costs for the following improvements:

Orange Avenue (NS) at Hill Street (EW) - #4
If necessary, extend the southbound left turn lane striping to provide 250 feet of storage length (including bay taper).

Mr. Steven Christie
SIGNAL HILL XC, LLC
September 21, 2018

Walnut Avenue (NS) at Hill Street (EW) - #10
Extend the no parking restriction on the northbound approach to 100 feet south of the intersection. This will result in the loss of approximately two on-street parking spaces, but will allow for a de facto right turn lane.

Cherry Avenue (NS) at Willow Street (EW) - #15
Modify the westbound raised median to accommodate 250 feet of storage length for dual left turn lanes plus a left-turn bay taper of approximately 120 feet.

CONCLUSION

We appreciate the opportunity to assist you on this project. Should you have any questions or if we can be of further assistance, please do not hesitate to call at (714) 795-3100.

Sincerely,

Giancarlo Ganddini, PE, PTP
Principal



Table 1
Project Trip Contribution

ID	Study Intersection	Jurisdiction[1]	Peak Hour Project Trips		40 or More Trips Added?
			Morning	School PM/ Evening	
1.	Orange Ave at Spring St	SH/LB	36	37	No
2.	Orange Ave at Willow St	SH/LB	60	62	Yes
3.	Orange Ave at Burnett St	SH	60	62	Yes
4.	Orange Ave at Hill St	SH/LB	69	71	Yes
6.	Gundry Ave at Hill St	SH	71	72	Yes
7.	Walnut Ave at Spring St	SH/LB	9	9	No
8.	Walnut Ave at Willow St	SH	9	9	No
9.	Walnut Ave at Burnett St	SH	9	9	No
10.	Walnut Ave at Hill St	SH	95	93	Yes
13.	Gaviota Ave at Hill St	SH	64	62	Yes
14.	Cherry Ave at Spring St	SH/LB	28	29	No
15.	Cherry Ave at Willow St	SH	79	78	Yes
16.	Cherry Ave at Burnett St	SH	79	78	Yes
17.	Cherry Ave at Hill St	SH	79	78	Yes
18.	Cherry Ave at 21st St	SH	15	16	No
19.	Cherry Ave at 20th St	SH	0	0	No

Notes:

(1) SH = City of Signal Hill; LB = City of Long Beach

Table 2
Left-Turn Lane Queue Lengths

ID	Study Intersection	Movement[1]	Storage Length[2]	Opening Year (2020) With Project			
				95th-Percentile Queue Length (Feet)			Adequate Storage Length?
				Morning	School PM	Evening	
2.	Orange Ave at Willow St	NBL	145+	46	n/a	47	Yes
4.	Orange Ave at Hill St	SBL	225+	219	84	86	Yes
14.	Cherry Ave at Spring St	WBL	215+	138	n/a	120	Yes
15.	Cherry Ave at Willow St	WBL	225	167	n/a	201	Yes

ID	Study Intersection	Movement[1]	Storage Length[2]	General Plan Buildout (Year 2040) With Project			
				95th-Percentile Queue Length (Feet)			Adequate Storage Length?
				Morning	School PM	Evening	
2.	Orange Ave at Willow St	NBL	145+	66	n/a	59	Yes
4.	Orange Ave at Hill St	SBL	225+	240	98	104	No
14.	Cherry Ave at Spring St	WBL	215+	162	n/a	140	Yes
15.	Cherry Ave at Willow St	WBL	225	195	n/a	276	No

Table 3
Project Fair Share Percentage

ID	Study Intersection	Peak Hour	Existing Volume	General Plan Buildout Volume	Total New Volume	Project Trips	Project % of New Traffic
2.	Orange Ave at Willow St	Morning	3,574	4,507	933	60	6.4%
		Evening	4,159	5,235	1,076	62	5.8%
3.	Orange Ave at Burnett St	Morning	1,537	1,999	462	60	13.0%
		Evening	1,521	1,988	467	62	13.3%
4.	Orange Ave at Hill St	Morning	1,742	2,260	518	69	13.3%
		School PM	1,683	2,195	512	71	13.9%
		Evening	1,641	2,142	501	71	14.2%
10.	Walnut Ave at Hill St	Morning	805	1,098	293	95	32.4%
		School PM	951	1,269	318	93	29.2%
		Evening	859	1,156	297	93	31.3%
15.	Cherry Ave at Willow St	Morning	4,989	6,283	1,294	79	6.1%
		Evening	5,804	7,286	1,482	78	5.3%
16.	Cherry Ave at Burnett St	Morning	2,609	3,311	702	79	11.3%
		Evening	2,852	3,611	759	78	10.3%
17.	Cherry Ave at Hill St	Morning	2,388	3,042	654	79	12.1%
		Evening	2,600	3,302	702	78	11.1%

Table 4
Cost Estimate and Project Fair Share

ID	Study Intersection	Improvement	Cost Estimate	Project % of New Traffic[1]	Project Fair Share of Cost
2.	Orange Ave at Willow St	- Update signal timing[2]	$ 5,000	6.4%	$ 322
3.	Orange Ave at Burnett St	- Update signal timing	$ 5,000	13.3%	$ 664
4.	Orange Ave at Hill St	- Update signal timing - Extend the southbound left turn lane striping to provide 250 feet of storage length (including bay taper).[3]	$ 5,000 $ 3,750	14.2%	$ 1,240
10.	Walnut Ave at Hill St	- Extend the no parking restriction on the northbound approach to 100 feet south of the intersection. This will result in the loss of approximately two on-street parking spaces, but will allow for a de facto right turn lane.	$ 1,500	32.4%	$ 486
15.	Cherry Ave at Willow St	- Update signal timing - Modify the westbound raised median to accommodate 250 feet of storage length for dual left turn lanes plus a left-turn bay taper of approximately 120 feet.[4]	$ 5,000 $ 30,000	6.1%	$ 2,137
16.	Cherry Ave at Burnett St	- Update signal timing	$ 5,000	11.3%	$ 563
17.	Cherry Ave at Hill St	- Update signal timing	$ 5,000	12.1%	$ 604
TOTAL			$ 65,250		$ 6,016

Notes:

(1) Based on greater of morning, school afternoon, or evening peak hour share from Table 3.

(2) Source: National Traffic Signal Report Card: Technical Report 2005, National Transportation Operations Coalition (http://www.ite.org/reportcard/NTS_TechReport.pdf)

(3) Cost to remove and add striping is estimated at $15 per linear foot.

(4) https://safety.fhwa.dot.gov/saferjourney1/Library/countermeasures/16.htm

APPENDIX A

GLOSSARY

GLOSSARY OF TERMS

ACRONYMS

AC	Acres
ADT	Average Daily Traffic
Caltrans	California Department of Transportation
DU	Dwelling Unit
ICU	Intersection Capacity Utilization
LOS	Level of Service
TSF	Thousand Square Feet
V/C	Volume/Capacity
VMT	Vehicle Miles Traveled

TERMS

AVERAGE DAILY TRAFFIC: The average 24-hour volume for a stated period divided by the number of days in that period. For example, Annual Average Daily Traffic is the total volume during a year divided by 365 days.

BANDWIDTH: The number of seconds of green time available for through traffic in a signal progression.

BOTTLENECK: A point of constriction along a roadway that limits the amount of traffic that can proceed downstream from its location.

CAPACITY: The maximum number of vehicles that can be reasonably expected to pass over a given section of a lane or a roadway in a given time period.

CHANNELIZATION: The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movements of both vehicles and pedestrians.

CLEARANCE INTERVAL: Nearly same as yellow time. If there is an all red interval after the end of a yellow, then that is also added into the clearance interval.

CONTROL DELAY: The component of delay, typically expressed in seconds per vehicle, resulting from the type of traffic control at an intersection. Control delay is measured by comparison with the uncontrolled condition; it includes delay incurred by slowing down, stopping/waiting, and speeding up.

CORDON: An imaginary line around an area across which vehicles, persons, or other items are counted (in and out).

CORNER SIGHT DISTANCE: The minimum sight distance required by the driver of a vehicle to cross or enter the lanes of the major roadway without requiring approaching traffic travelling at a given speed to radically alter their speed or trajectory. Corner sight distance is measured from the driver's eye at 42 inches above the pavement to an object height of 36 inches above the pavement in the center of the nearest approach lane.

CYCLE LENGTH: The time period in seconds required for a traffic signal to complete one full cycle of indications.

CUL-DE-SAC: A local street open at one end only and with special provisions for turning around.

DAILY CAPACITY: A theoretical value representing the daily traffic volume that will typically result in a peak hour volume equal to the capacity of the roadway.

DELAY: The time consumed while traffic is impeded in its movement by some element over which it has no control, usually expressed in seconds per vehicle.

DEMAND RESPONSIVE SIGNAL: Same as traffic-actuated signal.

DENSITY: The number of vehicles occupying in a unit length of the through traffic lanes of a roadway at any given instant. Usually expressed in vehicles per mile.

DETECTOR: A device that responds to a physical stimulus and transmits a resulting impulse to the signal controller.

DESIGN SPEED: A speed selected for purposes of design. Features of a highway, such as curvature, superelevation, and sight distance (upon which the safe operation of vehicles is dependent) are correlated to design speed.

DIRECTIONAL SPLIT: The percent of traffic in the peak direction at any point in time.

DIVERSION: The rerouting of peak hour traffic to avoid congestion.

FORCED FLOW: Opposite of free flow.

FREE FLOW: Volumes are well below capacity. Vehicles can maneuver freely and travel is unimpeded by other traffic.

GAP: Time or distance between successive vehicles in a traffic stream, rear bumper to front bumper.

HEADWAY: Time or distance spacing between successive vehicles in a traffic stream, front bumper to front bumper.

INTERCONNECTED SIGNAL SYSTEM: A number of intersections that are connected to achieve signal progression.

LEVEL OF SERVICE: A qualitative measure of a number of factors, which include speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs.

LOOP DETECTOR: A vehicle detector consisting of a loop of wire embedded in the roadway, energized by alternating current and producing an output circuit closure when passed over by a vehicle.

MINIMUM ACCEPTABLE GAP: Smallest time headway between successive vehicles in a traffic stream into which another vehicle is willing and able to cross or merge.

MULTI-MODAL: More than one mode; such as automobile, bus transit, rail rapid transit, and bicycle transportation modes.

OFFSET: The time interval in seconds between the beginning of green at one intersection and the beginning of green at an adjacent intersection.

PLATOON: A closely grouped component of traffic that is composed of several vehicles moving, or standing ready to move, with clear spaces ahead and behind.

PASSENGER CAR EQUIVALENT (PCE): A metric used to assess the impact of larger vehicles, such as trucks, recreational vehicles, and buses, by converting the traffic volume of larger vehicles to an equivalent number of passenger cars.

PEAK HOUR: The 60 consecutive minutes with the highest number of vehicles.

PRETIMED SIGNAL: A type of traffic signal that directs traffic to stop and go on a predetermined time schedule without regard to traffic conditions. Also, fixed time signal.

PROGRESSION: A term used to describe the progressive movement of traffic through several signalized intersections.

QUEUE: The number of vehicles waiting at a service area such as a traffic signal, stop sign, or access gate.

QUEUE LENGTH: The length of vehicle queue, typically expressed in feet, waiting at a service area such as a traffic signal, stop sign, or access gate.

SCREEN-LINE: An imaginary line or physical feature across which all trips are counted, normally to verify the validity of mathematical traffic models.

SHARED/RECIPROCAL PARKING AGREEMENT: A written binding document executed between property owners to provide a designated number of off-street parking stalls within a designated area to be available for specified businesses or land uses.

SIGHT DISTANCE: The continuous length of roadway visible to a driver or roadway user.

SIGNAL CYCLE: The time period in seconds required for one complete sequence of signal indications.

SIGNAL PHASE: The part of the signal cycle allocated to one or more traffic movements.

STACKING DISTANCE: The length of area available behind a service area, such as a traffic signal or gate, for vehicle queueing to occur.

STARTING DELAY: The delay experienced in initiating the movement of queued traffic from a stop to an average running speed through an intersection.

STOPPING SIGHT DISTANCE: The minimum distance required by the driver of a vehicle on the major roadway travelling at a given speed to bring the vehicle to a stop after an object on the road becomes visible. Stopping sight distance is measured from the driver's eye at 42 inches above the pavement to an object height of 6 inches above the pavement.

TRAFFIC-ACTUATED SIGNAL: A type of traffic signal that directs traffic to stop and go in accordance with the demands of traffic, as registered by the actuation of detectors.

TRIP: The movement of a person or vehicle from one location (origin) to another (destination). For example, from home to store to home is two trips, not one.

TRIP-END: One end of a trip at either the origin or destination (i.e., each trip has two trip-ends). A trip-end occurs when a person, object, or message is transferred to or from a vehicle.

TRIP GENERATION RATE: The quantity of trips produced and/or attracted by a specific land use stated in terms of units such as per dwelling, per acre, and per 1,000 square feet of floor space.

TRUCK: A vehicle having dual tires on one or more axles, or having more than two axles.

TURNING RADIUS: The circular arc formed by the smallest turning path radius of the front outside tire of a vehicle, such as that performed by a U-turn maneuver. This is based on the length and width of the wheel base as well as the steering mechanism of the vehicle.

UNBALANCED FLOW: Heavier traffic flow in one direction than the other. On a daily basis, most facilities have balanced flow. During the peak hours, flow is seldom balanced in an urban area.

VEHICLE MILES OF TRAVEL: A measure of the amount of usage of a section of highway, obtained by multiplying the average daily traffic by length of facility in miles.

APPENDIX B

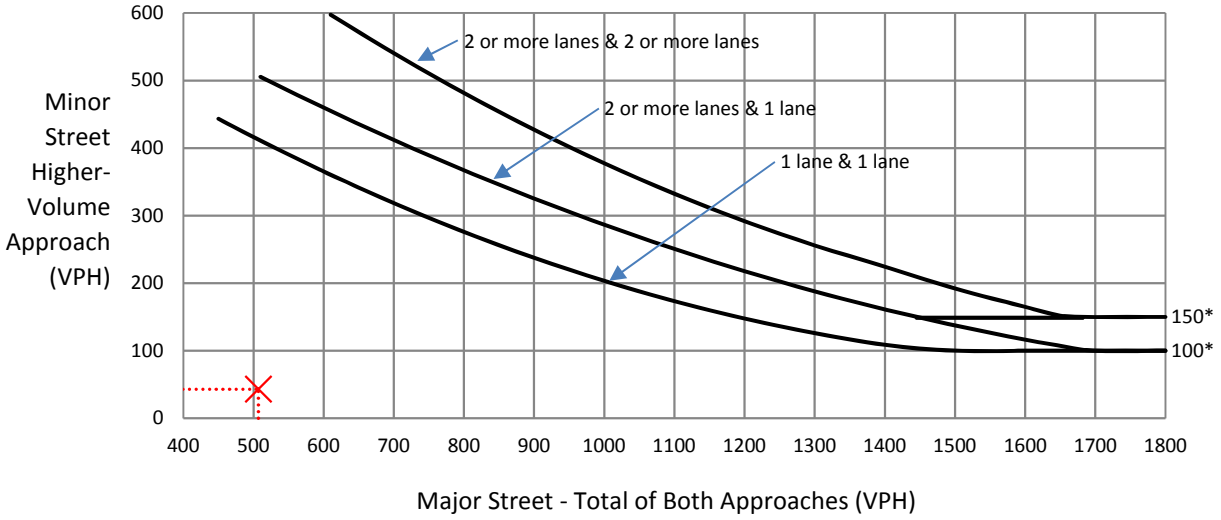
TRAFFIC SIGNAL WARRANT WORKSHEETS

Figure C-1

Gundry Ave (NS) / Hill St (EW) - #6
General Plan Buildout With Project
AM Peak Hour

Major Street:	Hill St	Volume:	507
Minor Street:	Gundry Ave	Volume:	43

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

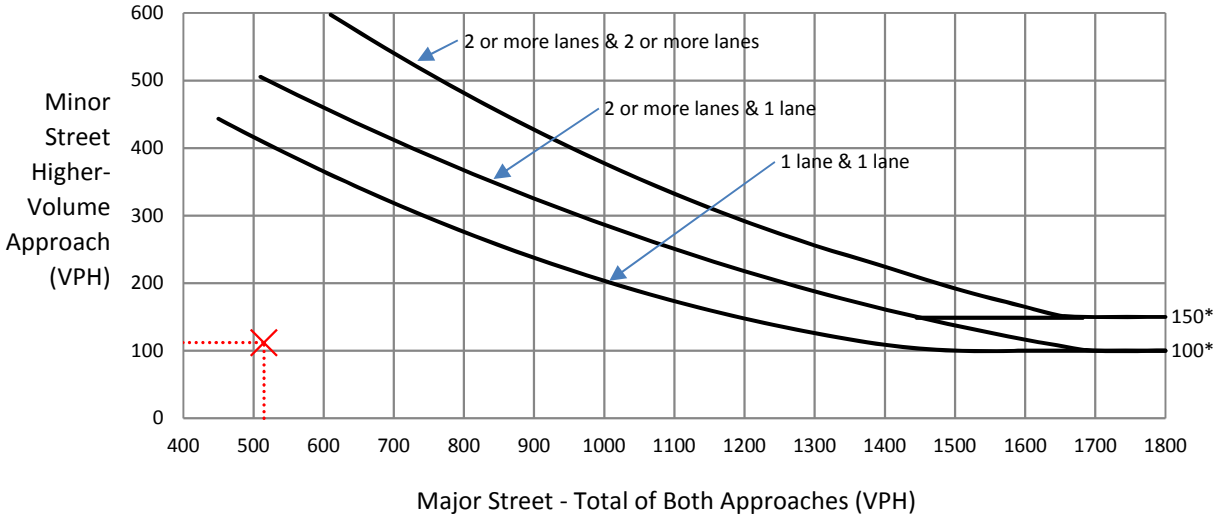
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-2

Gundry Ave (NS) / Hill St (EW) - #6
General Plan Buildout With Project
School PM Peak Hour

Major Street:	Hill St	Volume:	515
Minor Street:	Gundry Ave	Volume:	112

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

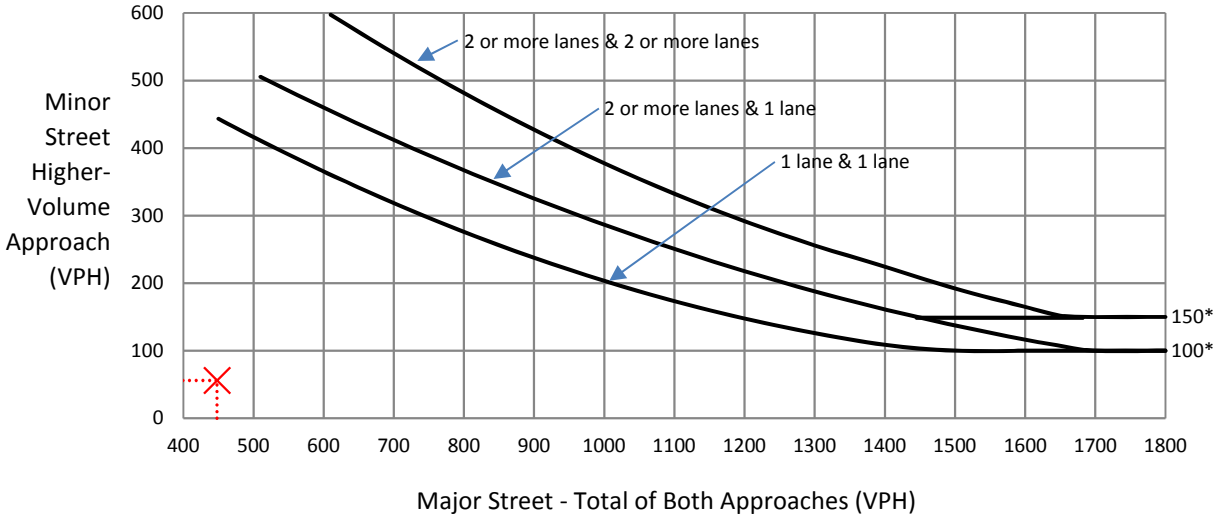
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-3

Gundry Ave (NS) / Hill St (EW) - #6
General Plan Buildout With Project
PM Peak Hour

Major Street:	Hill St	Volume:	448
Minor Street:	Gundry Ave	Volume:	56

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

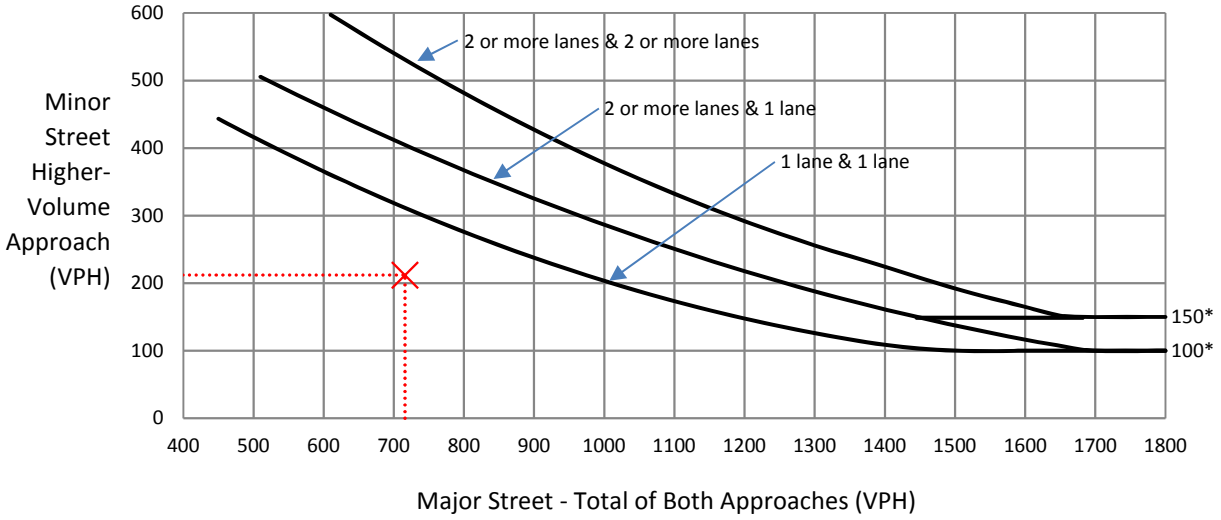
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-4

Walnut Ave (NS) / Hill St (EW) - #10
General Plan Buildout With Project
AM Peak Hour

Major Street:	Walnut Ave	Volume:	716
Minor Street:	Hill St	Volume:	212

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

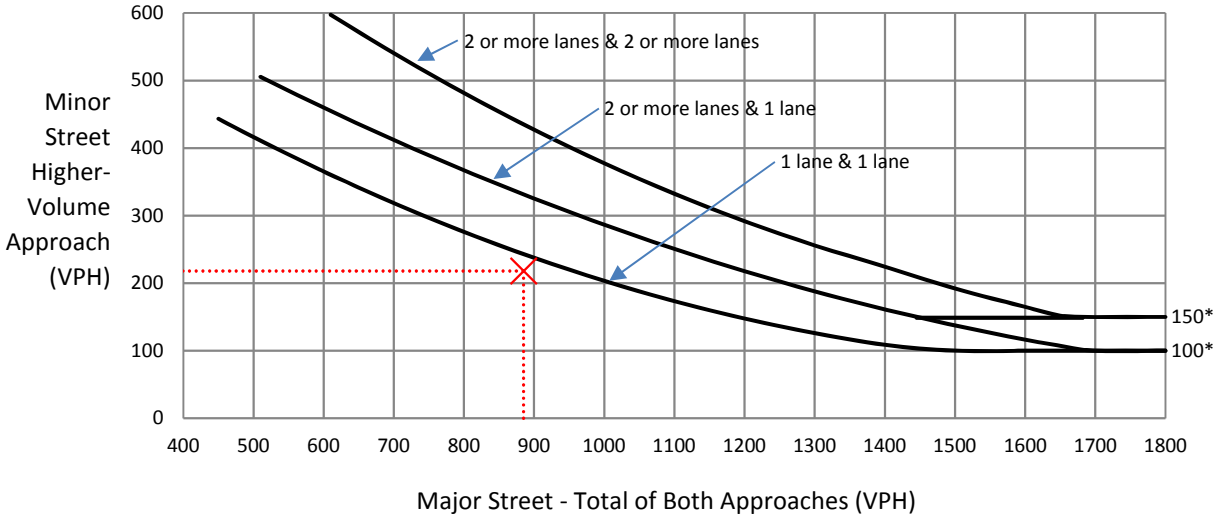
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-5

Walnut Ave (NS) / Hill St (EW) - #10
General Plan Buildout With Project
School PM Peak Hour

Major Street:	Walnut Ave	Volume:	885
Minor Street:	Hill St	Volume:	218

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

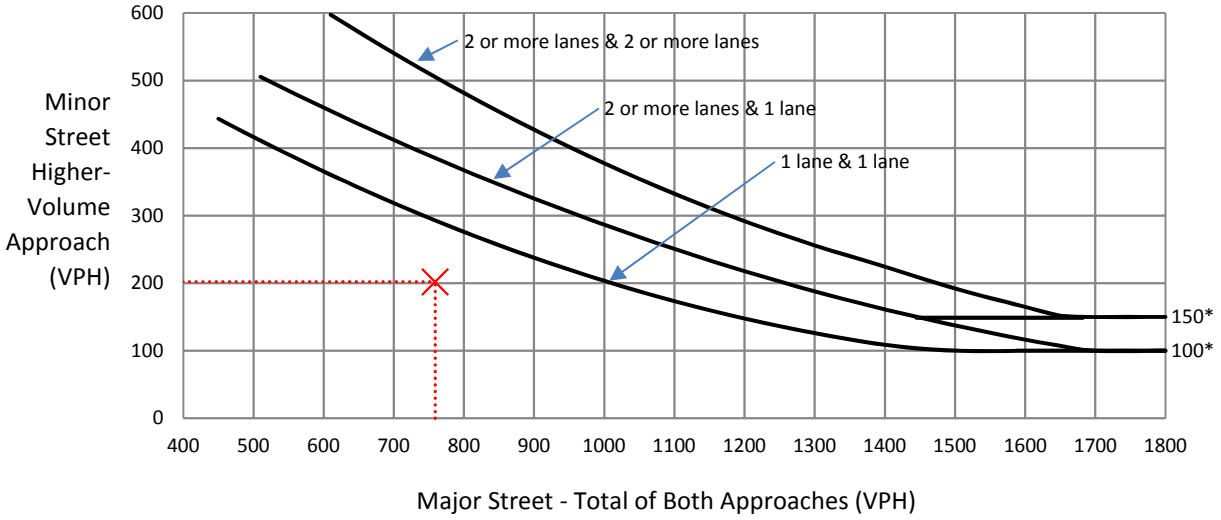
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-6

Walnut Ave (NS) / Hill St (EW) - #10
General Plan Buildout With Project
PM Peak Hour

Major Street:	Walnut Ave	Volume:	759
Minor Street:	Hill St	Volume:	202

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

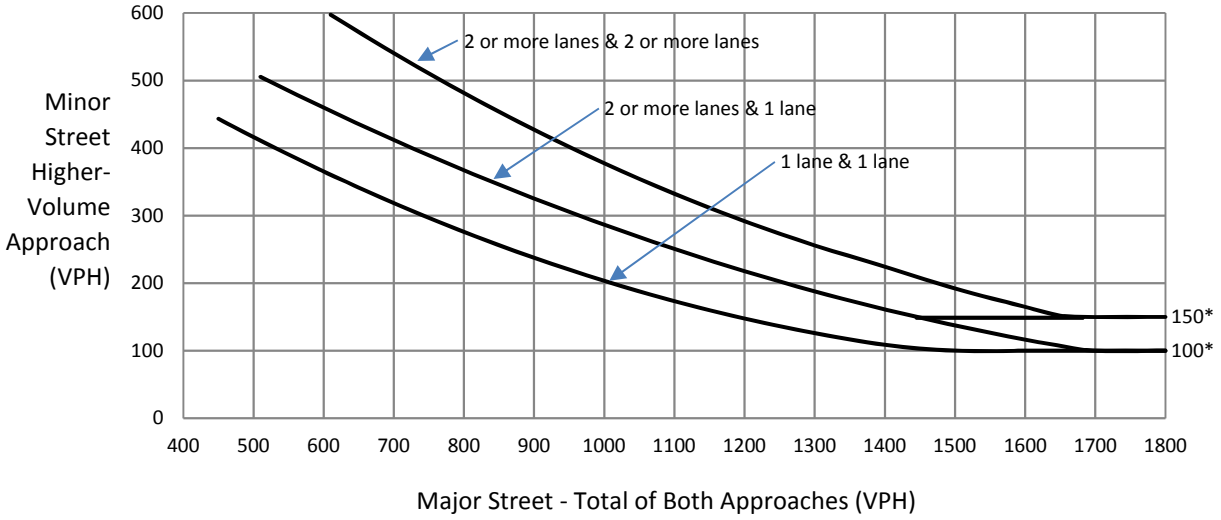
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-7

Gaviota Ave (NS) / Hill St (EW) - #13
General Plan Buildout With Project
AM Peak Hour

Major Street:	Hill St	Volume:	374
Minor Street:	Gaviota Ave	Volume:	45

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

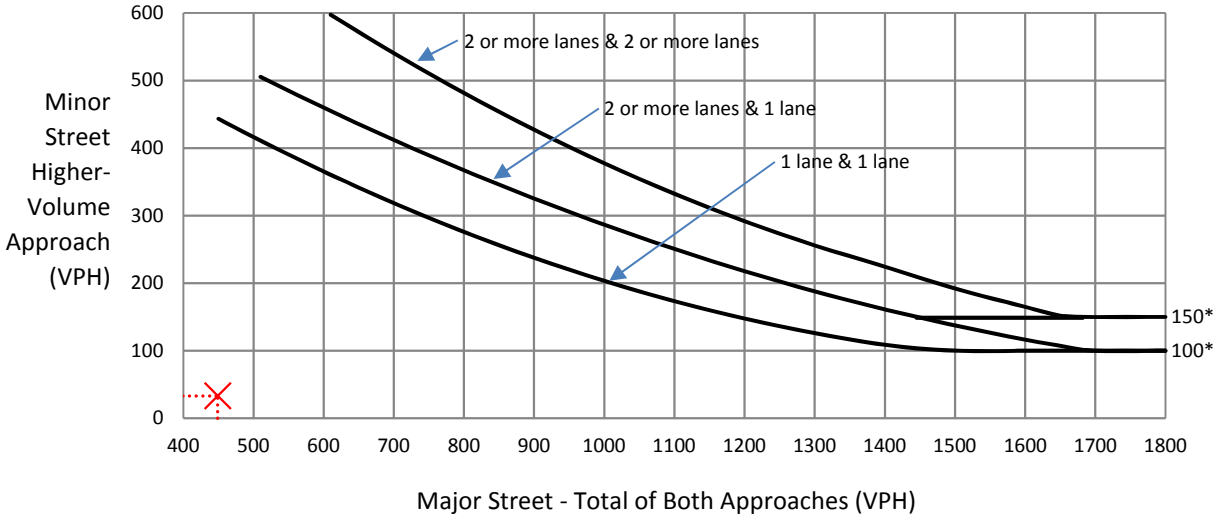
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-8

Gaviota Ave (NS) / Hill St (EW) - #13
General Plan Buildout With Project
PM Peak Hour

Major Street:	Hill St	Volume:	449
Minor Street:	Gaviota Ave	Volume:	33

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

APPENDIX C

HCM QUEUE LENGTH WORKSHEETS

Opening Year (2020) With Project

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	32.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.625

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	82	492	92	40	439	83	84	931	72	69	1128	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	12	0	8	36	2	4	30	21	0	16	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	514	94	49	484	87	90	980	94	70	1167	76
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	129	24	12	121	22	23	245	24	18	292	19
Total Analysis Volume [veh/h]	89	514	94	49	484	87	90	980	94	70	1167	76
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	31	0	11	31	0	31	46	0	12	27	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	55	45	55	44	44	7	27	27	6	27	27
g / C, Green / Cycle	0.55	0.45	0.55	0.44	0.44	0.07	0.27	0.27	0.06	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.08	0.27	0.05	0.25	0.05	0.05	0.20	0.20	0.04	0.23	0.23
s, saturation flow rate [veh/h]	1064	1900	1023	1900	1615	1810	3618	1816	1810	3618	1841
c, Capacity [veh/h]	502	858	473	836	710	119	993	498	110	975	496
d1, Uniform Delay [s]	13.14	20.64	13.07	21.08	16.61	45.99	32.85	32.87	45.92	34.58	34.59
k, delay calibration	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.77	3.08	0.09	2.92	0.35	9.35	1.00	1.99	5.89	2.10	4.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.18	0.60	0.10	0.58	0.12	0.76	0.72	0.72	0.63	0.84	0.84
d, Delay for Lane Group [s/veh]	13.91	23.72	13.17	24.01	16.96	55.34	33.85	34.86	51.81	36.69	38.71
Lane Group LOS	B	C	B	C	B	E	C	C	D	D	D
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.02	9.42	0.50	8.90	1.23	2.50	7.84	8.03	1.87	9.58	10.03
50th-Percentile Queue Length [ft/ln]	25.50	235.41	12.59	222.39	30.83	62.42	195.98	200.64	46.81	239.46	250.80
95th-Percentile Queue Length [veh/ln]	1.84	14.45	0.91	13.79	2.22	4.49	12.43	12.67	3.37	14.65	15.23
95th-Percentile Queue Length [ft/ln]	45.90	361.22	22.65	344.68	55.50	112.36	310.78	316.79	84.25	366.35	380.67

Movement, Approach, & Intersection Results

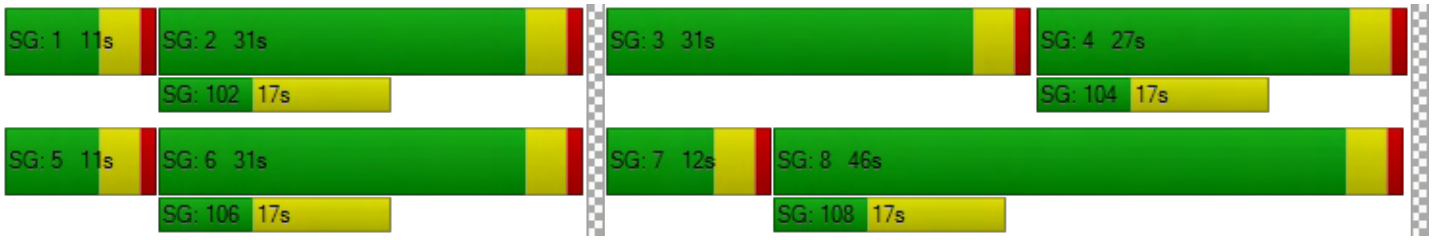
d_M, Delay for Movement [s/veh]	13.91	23.72	0.00	13.17	24.01	16.96	55.34	34.13	34.86	51.81	37.28	38.71
Movement LOS	B	C		B	C	B	E	C	C	D	D	D
d_A, Approach Delay [s/veh]	22.27			22.16			35.83			38.14		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	32.15											
Intersection LOS	C											
Intersection V/C	0.625											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.549	2.558	3.006	2.958
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	540	540	840	460
d_b, Bicycle Delay [s]	26.65	26.65	16.82	29.65
l_b,int, Bicycle LOS Score for Intersection	2.555	2.583	2.200	2.282
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	341.3
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	3.755

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	40	667	22	28	526	25	78	90	38	47	124	57
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	3	54	19	9	6	9	0	4	2	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	41	695	25	83	556	35	86	101	39	52	128	71
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	174	6	21	139	9	22	25	10	13	32	18
Total Analysis Volume [veh/h]	41	695	25	83	556	35	86	101	39	52	128	71
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	24	0	0	24	0	0	76	0	0	76	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	20	20	20	20	72	72	72	72
g / C, Green / Cycle	0.20	0.20	0.20	0.20	0.72	0.72	0.72	0.72
(v / s)_i Volume / Saturation Flow Rate	0.05	0.38	0.11	0.31	3.00	0.02	1.38	0.04
s, saturation flow rate [veh/h]	839	1888	744	1880	62	1615	130	1615
c, Capacity [veh/h]	72	381	72	379	97	1160	140	1160
d1, Uniform Delay [s]	50.00	39.92	50.00	39.92	32.94	4.06	37.36	4.15
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	28.63	410.77	153.09	264.12	449.81	0.01	171.35	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.57	1.89	1.15	1.56	1.92	0.03	1.28	0.06
d, Delay for Lane Group [s/veh]	78.63	450.69	203.09	304.04	482.74	4.08	208.71	4.17
Lane Group LOS	E	F	F	F	F	A	F	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	1.59	52.65	4.86	36.99	13.11	0.20	8.83	0.37
50th-Percentile Queue Length [ft/ln]	39.86	1316.37	121.42	924.65	327.80	5.01	220.86	9.30
95th-Percentile Queue Length [veh/ln]	2.87	81.97	8.74	56.86	23.60	0.36	15.90	0.67
95th-Percentile Queue Length [ft/ln]	71.75	2049.37	218.55	1421.53	590.04	9.01	397.55	16.75

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	78.63	450.69	450.69	203.09	304.04	304.04	482.74	482.74	4.08	208.71	208.71	4.17
Movement LOS	E	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	430.64			291.61			400.14			150.85		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	341.30											
Intersection LOS	F											
Intersection V/C	3.755											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.553	2.630	2.143	2.213
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	400	400	1440	1440
d_b, Bicycle Delay [s]	32.00	32.00	3.92	3.92
l_b,int, Bicycle LOS Score for Intersection	2.815	2.672	1.933	1.974
Bicycle LOS	C	B	A	A

Sequence

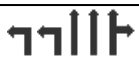
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Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	33.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.685

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	86	1069	170	281	1098	137	120	544	75	105	1052	358
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	21	1	0	46	0	0	1	8	5	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	90	1111	174	287	1166	140	122	556	85	112	1074	365
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	278	44	72	292	35	31	139	21	28	269	91
Total Analysis Volume [veh/h]	90	1111	174	287	1166	140	122	556	85	112	1074	365
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	23	39	0	17	33	0	13	21	0	23	31	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	39	39	13	45	45	8	24	24	8	24	24	24
g / C, Green / Cycle	0.06	0.39	0.39	0.13	0.45	0.45	0.08	0.24	0.24	0.08	0.24	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.05	0.24	0.24	0.11	0.24	0.24	0.07	0.12	0.12	0.06	0.20	0.20	0.20
s, saturation flow rate [veh/h]	1810	3618	1771	2663	3618	1798	1810	3618	1775	1810	3618	1867	1615
c, Capacity [veh/h]	118	1418	694	338	1640	815	153	875	429	144	857	442	383
d1, Uniform Delay [s]	46.02	24.30	24.30	42.79	19.71	19.71	45.00	32.65	32.71	45.22	36.57	36.57	36.57
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.21	0.21
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.56	1.95	3.94	5.98	1.24	2.48	9.15	0.43	0.89	8.69	2.58	9.02	10.29
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.76	0.61	0.61	0.85	0.53	0.53	0.80	0.49	0.50	0.78	0.86	0.86	0.86
d, Delay for Lane Group [s/veh]	55.58	26.25	28.24	48.76	20.95	22.20	54.16	33.07	33.60	53.90	39.15	45.58	46.86
Lane Group LOS	E	C	C	D	C	C	D	C	C	D	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.50	8.32	8.53	3.72	7.35	7.59	3.34	4.46	4.51	3.06	8.72	9.80	8.61
50th-Percentile Queue Length [ft/ln]	62.58	207.98	213.31	93.05	183.83	189.83	83.56	111.53	112.71	76.49	218.1	244.9	215.3
95th-Percentile Queue Length [veh/ln]	4.51	13.05	13.32	6.70	11.80	12.11	6.02	7.93	7.99	5.51	13.57	14.93	13.43
95th-Percentile Queue Length [ft/ln]	112.64	326.23	333.08	167.50	295.01	302.81	150.40	198.13	199.76	137.6	339.2	373.2	335.7

Movement, Approach, & Intersection Results

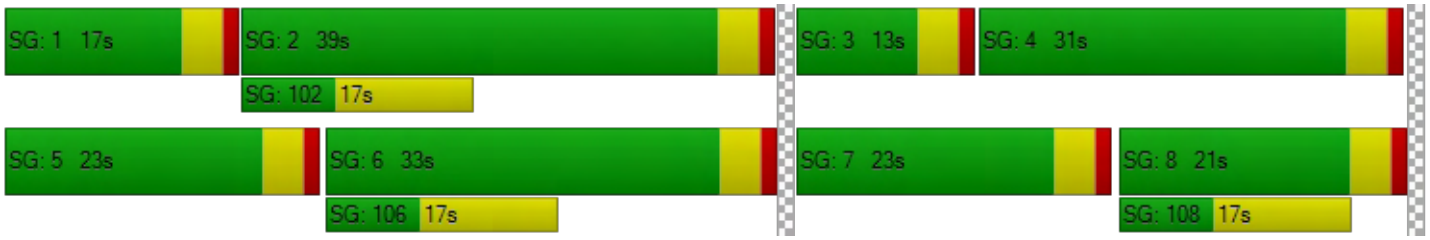
d_M, Delay for Movement [s/veh]	55.58	26.70	28.24	48.76	21.26	22.20	54.16	33.19	33.60	53.90	41.19	46.84
Movement LOS	E	C	C	D	C	C	D	C	C	D	D	D
d_A, Approach Delay [s/veh]	28.78			26.30			36.59			43.41		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	33.46											
Intersection LOS	C											
Intersection V/C	0.685											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	0.00	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.064	0.000	2.887	3.043
Crosswalk LOS	C	F	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	700	580	340	540
d_b, Bicycle Delay [s]	21.13	25.21	34.45	26.65
l_b,int, Bicycle LOS Score for Intersection	2.316	2.436	1.979	2.413
Bicycle LOS	B	B	A	B

Sequence

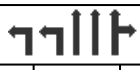
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Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	35.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.643

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	167	1031	161	149	765	147	177	836	85	231	1124	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	24	28	31	0	1	28	0	51	10	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	170	1067	188	180	811	150	182	881	87	287	1156	126
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	43	267	47	45	203	38	46	220	22	72	289	32
Total Analysis Volume [veh/h]	170	1067	188	180	811	150	182	881	87	287	1156	126
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	33	41	41	13	21	0	13	29	0	17	33	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	40	57	9	37	37	9	23	23	13	27	27
g / C, Green / Cycle	0.11	0.40	0.57	0.09	0.37	0.37	0.09	0.23	0.23	0.13	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.09	0.21	0.12	0.07	0.18	0.18	0.07	0.18	0.18	0.11	0.24	0.24
s, saturation flow rate [veh/h]	1810	5176	1615	2663	3618	1752	2663	3618	1814	2663	3618	1806
c, Capacity [veh/h]	208	2077	918	231	1350	654	233	814	408	339	957	478
d1, Uniform Delay [s]	43.28	22.61	10.55	44.78	23.96	23.98	44.75	36.60	36.61	42.75	35.47	35.47
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.15	0.11	0.11	0.30
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.64	0.91	0.50	5.60	1.22	2.52	5.62	1.78	4.95	5.87	3.19	14.41
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	0.51	0.20	0.78	0.48	0.48	0.78	0.79	0.79	0.85	0.89	0.89
d, Delay for Lane Group [s/veh]	50.92	23.52	11.06	50.38	25.18	26.50	50.36	38.38	41.57	48.63	38.66	49.88
Lane Group LOS	D	C	B	D	C	C	D	D	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	4.52	6.34	2.07	2.35	5.95	6.03	2.38	7.51	7.91	3.72	10.25	11.72
50th-Percentile Queue Length [ft/ln]	112.96	158.40	51.70	58.82	148.76	150.67	59.47	187.75	197.72	92.91	256.15	293.06
95th-Percentile Queue Length [veh/ln]	8.00	10.46	3.72	4.23	9.95	10.05	4.28	12.00	12.52	6.69	15.50	17.34
95th-Percentile Queue Length [ft/ln]	200.11	261.61	93.07	105.87	248.77	251.32	107.05	300.11	313.02	167.24	387.39	433.43

Movement, Approach, & Intersection Results

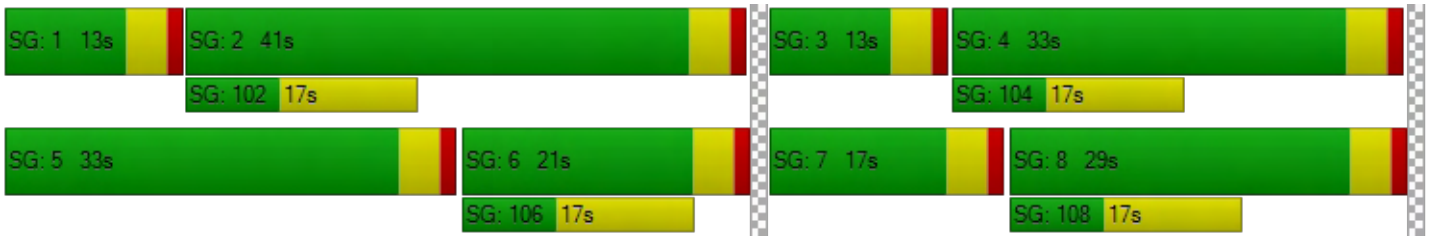
d_M, Delay for Movement [s/veh]	50.92	23.52	11.06	50.38	25.44	26.50	50.36	39.24	41.57	48.63	41.58	49.88
Movement LOS	D	C	B	D	C	C	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	25.14			29.52			41.17			43.54		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	35.04											
Intersection LOS	D											
Intersection V/C	0.643											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.048	3.037	3.050	3.074
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	740	340	500	580
d_b, Bicycle Delay [s]	19.85	34.45	28.13	25.21
l_b,int, Bicycle LOS Score for Intersection	2.343	2.187	2.192	2.423
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	287.3
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	3.064

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	20	16	5	11	3	0	3	8	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	598	45	46	580	45	70	82	42	65	141	94
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	150	11	12	145	11	18	21	11	16	35	24
Total Analysis Volume [veh/h]	50	598	45	46	580	45	70	82	42	65	141	94
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	25	0	0	25	0	0	75	0	0	75	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	21	21	71	71	71	71
g / C, Green / Cycle	0.21	0.21	0.21	0.21	0.71	0.71	0.71	0.71
(v / s)_i Volume / Saturation Flow Rate	0.06	0.34	0.06	0.33	2.42	0.03	1.77	0.06
s, saturation flow rate [veh/h]	813	1877	799	1876	63	1615	116	1615
c, Capacity [veh/h]	72	397	72	397	97	1144	130	1144
d1, Uniform Delay [s]	50.00	39.42	50.00	39.42	32.40	4.36	36.39	4.51
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	43.11	290.16	36.10	270.50	297.75	0.01	297.10	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.69	1.62	0.64	1.57	1.56	0.04	1.59	0.08
d, Delay for Lane Group [s/veh]	93.11	329.58	86.10	309.92	330.15	4.38	333.49	4.54
Lane Group LOS	F	F	F	F	F	A	F	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.11	41.59	1.87	39.41	8.98	0.23	12.60	0.53
50th-Percentile Queue Length [ft/ln]	52.69	1039.71	46.69	985.16	224.45	5.70	315.12	13.20
95th-Percentile Queue Length [veh/ln]	3.79	64.10	3.36	60.58	16.16	0.41	22.69	0.95
95th-Percentile Queue Length [ft/ln]	94.84	1602.61	84.04	1514.56	404.00	10.26	567.22	23.76

Movement, Approach, & Intersection Results

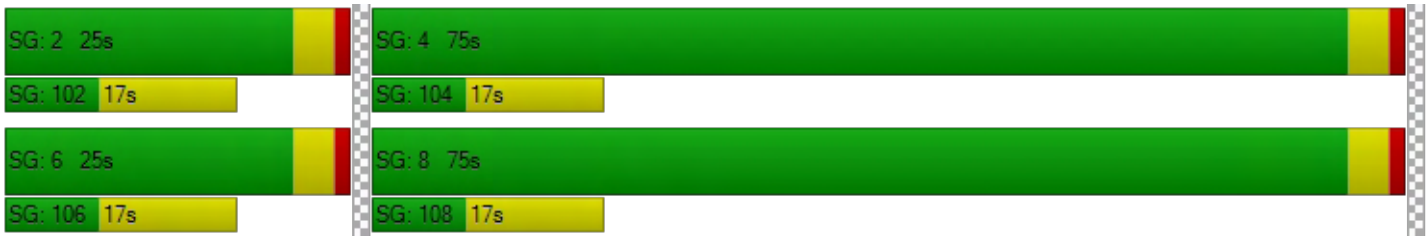
d_M, Delay for Movement [s/veh]	93.11	329.58	329.58	86.10	309.92	309.92	330.15	330.15	4.38	333.49	333.49	4.54
Movement LOS	F	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	312.52			294.58			259.62			230.42		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	287.26											
Intersection LOS	F											
Intersection V/C	3.064											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.565	2.585	2.156	2.164
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	420	420	1420	1420
d_b, Bicycle Delay [s]	31.21	31.21	4.21	4.21
l_b,int, Bicycle LOS Score for Intersection	2.703	2.667	1.880	2.055
Bicycle LOS	B	B	A	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	33.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.743

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	460	101	73	500	67	89	1451	74	135	1077	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	19	34	0	16	17	5	3	22	8	0	29	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	71	503	103	90	527	73	94	1502	83	138	1128	91
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	126	26	23	132	18	24	376	21	35	282	23
Total Analysis Volume [veh/h]	71	503	103	90	527	73	94	1502	83	138	1128	91
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	21	0	11	21	0	22	54	0	14	46	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	45	34	45	35	35	7	34	34	9	37	37
g / C, Green / Cycle	0.45	0.34	0.45	0.35	0.35	0.07	0.34	0.34	0.09	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.07	0.26	0.08	0.28	0.05	0.05	0.29	0.29	0.08	0.22	0.22
s, saturation flow rate [veh/h]	1058	1900	1082	1900	1615	1810	3618	1849	1810	3618	1828
c, Capacity [veh/h]	349	646	368	654	556	123	1233	630	170	1327	671
d1, Uniform Delay [s]	19.68	29.65	19.52	29.81	22.56	45.87	30.63	30.64	44.50	25.87	25.87
k, delay calibration	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.15	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.31	8.96	0.34	10.24	0.49	9.39	1.75	4.57	8.92	0.46	0.90
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.20	0.78	0.24	0.81	0.13	0.76	0.85	0.85	0.81	0.61	0.61
d, Delay for Lane Group [s/veh]	20.99	38.61	19.87	40.04	23.05	55.26	32.38	35.22	53.42	26.32	26.77
Lane Group LOS	C	D	B	D	C	E	C	D	D	C	C
Critical Lane Group	Yes	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.05	12.16	1.22	13.03	1.25	2.61	11.70	12.47	3.75	7.76	7.93
50th-Percentile Queue Length [ft/ln]	26.30	304.03	30.50	325.69	31.16	65.13	292.60	311.80	93.87	194.12	198.34
95th-Percentile Queue Length [veh/ln]	1.89	17.88	2.20	18.95	2.24	4.69	17.31	18.26	6.76	12.33	12.55
95th-Percentile Queue Length [ft/ln]	47.34	447.01	54.91	473.67	56.09	117.23	432.87	456.60	168.97	308.37	313.82

Movement, Approach, & Intersection Results

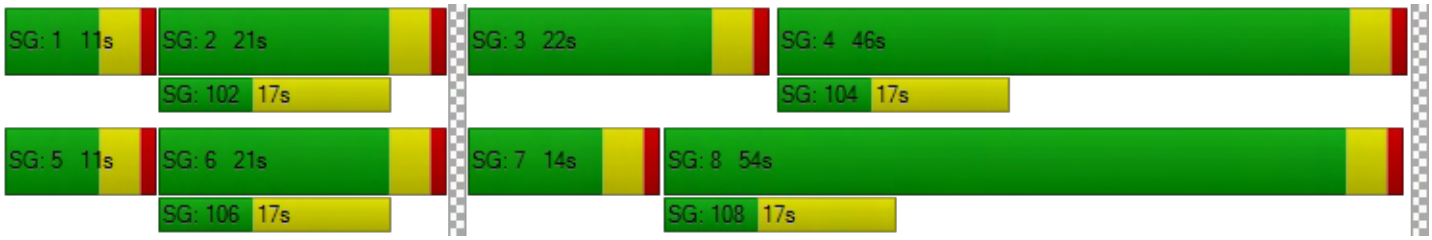
d_M, Delay for Movement [s/veh]	20.99	38.61	0.00	19.87	40.04	23.05	55.26	33.24	35.22	53.42	26.45	26.77
Movement LOS	C	D		B	D	C	E	C	D	D	C	C
d_A, Approach Delay [s/veh]	36.43			35.61			34.57			29.21		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	33.29											
Intersection LOS	C											
Intersection V/C	0.743											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.562	2.573	3.047	3.056
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	340	340	1000	840
d_b, Bicycle Delay [s]	34.45	34.45	12.50	16.82
l_b,int, Bicycle LOS Score for Intersection	2.507	2.698	2.483	2.306
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	98.5
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.594

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	31	563	33	27	592	43	36	107	30	42	103	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	20	16	5	11	3	0	3	8	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	597	37	48	620	49	48	112	31	46	113	83
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	149	9	12	155	12	12	28	8	12	28	21
Total Analysis Volume [veh/h]	32	597	37	48	620	49	48	112	31	46	113	83
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	34	0	0	34	0	0	66	0	0	66	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	31	31	31	31	61	61	61	61
g / C, Green / Cycle	0.31	0.31	0.31	0.31	0.61	0.61	0.61	0.61
(v / s)_i Volume / Saturation Flow Rate	0.04	0.34	0.06	0.36	1.08	0.02	1.02	0.05
s, saturation flow rate [veh/h]	780	1881	806	1876	148	1615	156	1615
c, Capacity [veh/h]	74	607	76	605	135	965	140	965
d1, Uniform Delay [s]	49.99	33.86	49.98	33.86	32.95	8.27	33.35	8.55
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	17.42	48.64	33.26	68.73	134.15	0.01	117.88	0.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.43	1.04	0.63	1.10	1.18	0.03	1.14	0.09
d, Delay for Lane Group [s/veh]	67.41	82.50	83.24	102.60	167.10	8.28	151.23	8.59
Lane Group LOS	E	F	F	F	F	A	F	A
Critical Lane Group	No	No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	1.15	22.73	1.90	26.05	7.05	0.26	6.70	0.71
50th-Percentile Queue Length [ft/ln]	28.85	568.15	47.51	651.15	176.37	6.43	167.44	17.82
95th-Percentile Queue Length [veh/ln]	2.08	31.43	3.42	36.69	12.64	0.46	11.87	1.28
95th-Percentile Queue Length [ft/ln]	51.93	785.85	85.52	917.17	315.98	11.58	296.64	32.07

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	67.41	82.50	82.50	83.24	102.60	102.60	167.10	167.10	8.28	151.23	151.23	8.59
Movement LOS	E	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	81.78			101.30			141.32			102.31		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	98.48											
Intersection LOS	F											
Intersection V/C	1.594											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.534	2.556	2.116	2.156
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	600	600	1240	1240
d_b, Bicycle Delay [s]	24.50	24.50	7.22	7.22
l_b,int, Bicycle LOS Score for Intersection	2.659	2.743	1.875	1.959
Bicycle LOS	B	B	A	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	32.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.662

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	1170	144	228	1250	109	155	916	128	93	656	368
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	43	5	0	28	0	0	2	4	2	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	108	1236	152	233	1303	111	158	936	135	97	670	375
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	309	38	58	326	28	40	234	34	24	168	94
Total Analysis Volume [veh/h]	108	1236	152	233	1303	111	158	936	135	97	670	375
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	17	24	0	14	21	0	15	21	0	41	47	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	43	43	10	46	46	11	24	24	7	20	20	20
g / C, Green / Cycle	0.08	0.43	0.43	0.10	0.46	0.46	0.10	0.24	0.24	0.07	0.20	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.06	0.26	0.26	0.09	0.26	0.26	0.09	0.20	0.20	0.05	0.15	0.15	0.15
s, saturation flow rate [veh/h]	1810	3618	1795	2663	3618	1825	1810	3618	1780	1810	3618	1745	1615
c, Capacity [veh/h]	139	1559	774	268	1646	830	191	861	424	128	735	354	328
d1, Uniform Delay [s]	45.41	21.80	21.80	44.38	20.08	20.09	43.90	36.27	36.28	45.70	37.38	37.41	37.43
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.10	1.68	3.35	8.44	1.44	2.84	8.81	2.20	4.38	8.85	1.45	3.02	3.29
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.78	0.59	0.59	0.87	0.57	0.57	0.83	0.83	0.83	0.76	0.74	0.74	0.74
d, Delay for Lane Group [s/veh]	54.51	23.48	25.16	52.82	21.53	22.93	52.71	38.47	40.67	54.55	38.83	40.42	40.72
Lane Group LOS	D	C	C	D	C	C	D	D	D	D	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.97	8.41	8.71	3.14	8.09	8.49	4.27	8.46	8.59	2.67	6.27	6.23	5.81
50th-Percentile Queue Length [ft/ln]	74.22	210.27	217.72	78.47	202.26	212.29	106.86	211.39	214.85	66.70	156.8	155.7	145.3
95th-Percentile Queue Length [veh/ln]	5.34	13.17	13.55	5.65	12.76	13.27	7.67	13.22	13.40	4.80	10.38	10.32	9.77
95th-Percentile Queue Length [ft/ln]	133.60	329.17	338.71	141.24	318.88	331.76	191.63	330.61	335.05	120.0	259.5	258.1	244.2

Movement, Approach, & Intersection Results

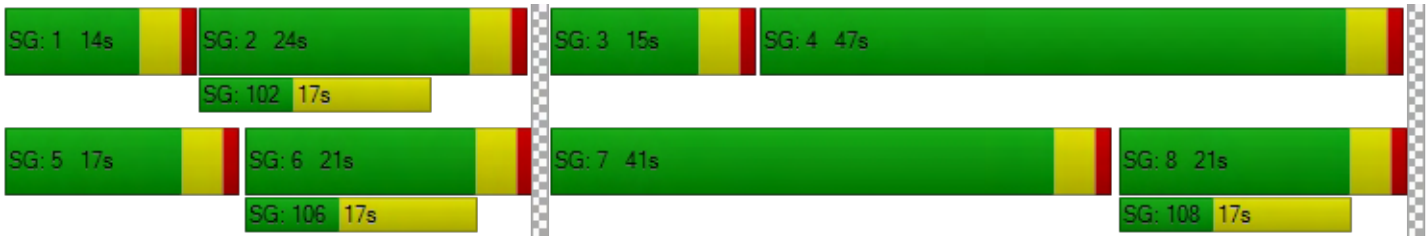
d_M, Delay for Movement [s/veh]	54.51	23.90	25.16	52.82	21.92	22.93	52.71	38.98	40.67	54.55	39.14	40.63
Movement LOS	D	C	C	D	C	C	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	26.24			26.36			40.93			40.93		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	32.59											
Intersection LOS	C											
Intersection V/C	0.662											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	0.00	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.100	0.000	2.894	3.030
Crosswalk LOS	C	F	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	400	340	340	860
d_b, Bicycle Delay [s]	32.00	34.45	34.45	16.25
l_b,int, Bicycle LOS Score for Intersection	2.382	2.465	2.236	2.188
Bicycle LOS	B	B	B	B

Sequence

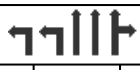
Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	38.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.801

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	166	835	219	303	980	183	211	1292	132	318	990	175
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	28	43	13	20	1	0	15	0	27	29	28
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	169	880	266	322	1020	188	215	1333	135	351	1039	207
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	220	67	81	255	47	54	333	34	88	260	52
Total Analysis Volume [veh/h]	169	880	266	322	1020	188	215	1333	135	351	1039	207
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	24	27	27	18	21	0	14	36	0	19	41	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	25	44	14	28	28	10	30	30	15	35	35
g / C, Green / Cycle	0.11	0.25	0.44	0.14	0.28	0.28	0.10	0.30	0.30	0.15	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.09	0.17	0.16	0.12	0.22	0.22	0.08	0.27	0.27	0.13	0.23	0.23
s, saturation flow rate [veh/h]	1810	5176	1615	2663	3618	1753	2663	3618	1812	2663	3618	1743
c, Capacity [veh/h]	205	1306	714	371	1007	488	266	1080	541	400	1261	608
d1, Uniform Delay [s]	43.40	33.72	18.64	42.18	33.65	33.66	44.14	33.77	33.79	41.66	27.68	27.68
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.34	0.11	0.11	0.19
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.97	2.79	1.49	6.20	6.98	13.48	5.80	3.22	16.04	6.31	0.61	2.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	0.67	0.37	0.87	0.81	0.81	0.81	0.91	0.91	0.88	0.67	0.67
d, Delay for Lane Group [s/veh]	51.37	36.51	20.13	48.38	40.64	47.14	49.94	36.99	49.83	47.97	28.29	29.85
Lane Group LOS	D	D	C	D	D	D	D	D	D	D	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.51	6.66	4.32	4.17	9.99	10.56	2.80	11.60	13.57	4.54	8.43	8.40
50th-Percentile Queue Length [ft/ln]	112.82	166.58	107.89	104.36	249.82	264.12	70.11	290.12	339.20	113.62	210.82	209.89
95th-Percentile Queue Length [veh/ln]	8.00	10.90	7.72	7.51	15.18	15.90	5.05	17.19	19.61	8.04	13.20	13.15
95th-Percentile Queue Length [ft/ln]	199.92	272.42	193.06	187.84	379.43	397.38	126.20	429.79	490.22	201.02	329.88	328.68

Movement, Approach, & Intersection Results

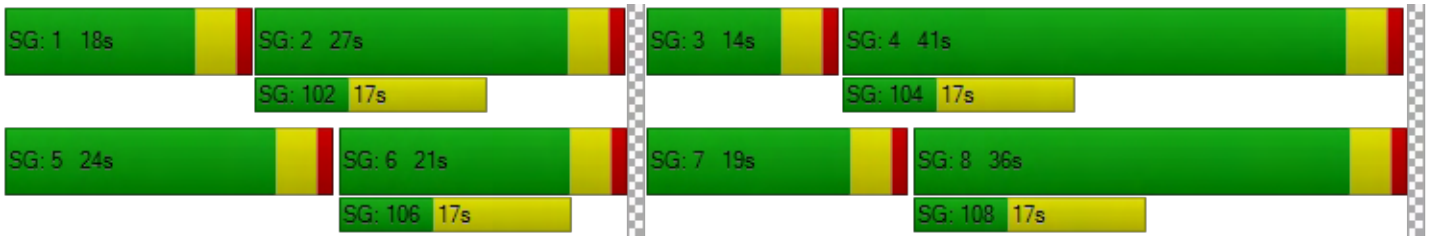
d_M, Delay for Movement [s/veh]	51.37	36.51	20.13	48.38	41.95	47.14	49.94	40.41	49.83	47.97	28.59	29.85
Movement LOS	D	D	C	D	D	D	D	D	D	D	C	C
d_A, Approach Delay [s/veh]	35.11			43.94			42.39			33.01		
Approach LOS	D			D			D			C		
d_I, Intersection Delay [s/veh]	38.77											
Intersection LOS	D											
Intersection V/C	0.801											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.074	3.075	3.106	3.159
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	460	340	640	740
d_b, Bicycle Delay [s]	29.65	34.45	23.12	19.85
l_b,int, Bicycle LOS Score for Intersection	2.283	2.401	2.485	2.438
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



General Plan Buildout (Year 2040) With Project

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	34.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.745

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	82	492	92	40	439	83	84	931	72	69	1128	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	12	0	8	36	2	4	30	21	0	16	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	105	612	112	57	572	103	106	1166	109	84	1392	89
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	153	28	14	143	26	27	292	27	21	348	22
Total Analysis Volume [veh/h]	105	612	112	57	572	103	106	1166	109	84	1392	89
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	23	0	12	21	0	26	21	0	44	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	49	39	49	38	38	8	33	33	6	32	32
g / C, Green / Cycle	0.49	0.39	0.49	0.38	0.38	0.08	0.33	0.33	0.06	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.10	0.32	0.06	0.30	0.06	0.06	0.23	0.23	0.05	0.27	0.27
s, saturation flow rate [veh/h]	1025	1900	979	1900	1615	1810	3618	1818	1810	3618	1842
c, Capacity [veh/h]	369	737	335	718	610	138	1198	602	116	1156	588
d1, Uniform Delay [s]	18.49	27.66	18.58	27.74	20.71	45.41	29.26	29.26	45.98	31.82	31.83
k, delay calibration	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.13
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.93	10.48	0.24	8.97	0.60	8.77	0.78	1.55	8.20	1.84	4.26
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.28	0.83	0.17	0.80	0.17	0.77	0.71	0.71	0.72	0.85	0.85
d, Delay for Lane Group [s/veh]	20.42	38.14	18.82	36.72	21.31	54.18	30.04	30.81	54.19	33.67	36.09
Lane Group LOS	C	D	B	D	C	D	C	C	D	C	D
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.47	14.87	0.69	13.56	1.68	2.90	8.84	9.02	2.30	11.10	11.70
50th-Percentile Queue Length [ft/ln]	36.76	371.68	17.35	338.96	42.09	72.60	221.03	225.40	57.58	277.43	292.48
95th-Percentile Queue Length [veh/ln]	2.65	21.19	1.25	19.60	3.03	5.23	13.72	13.94	4.15	16.56	17.31
95th-Percentile Queue Length [ft/ln]	66.17	529.77	31.23	489.92	75.76	130.67	342.95	348.51	103.65	414.02	432.71

Movement, Approach, & Intersection Results

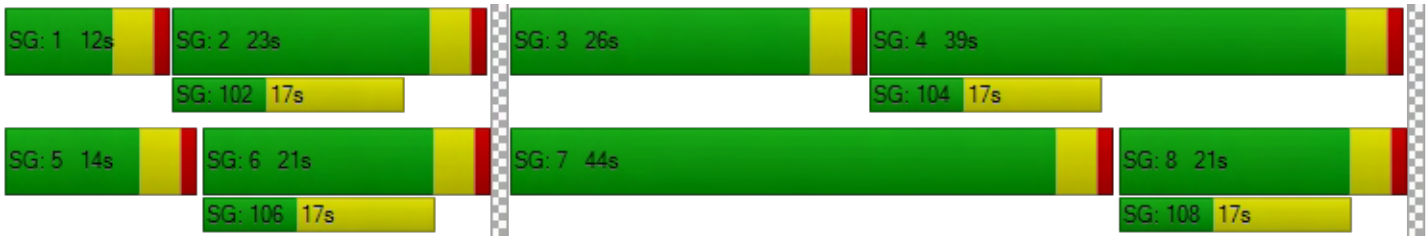
d_M, Delay for Movement [s/veh]	20.42	38.14	0.00	18.82	36.72	21.31	54.18	30.25	30.81	54.19	34.38	36.09
Movement LOS	C	D		B	D	C	D	C	C	D	C	D
d_A, Approach Delay [s/veh]	35.54			33.16			32.13			35.54		
Approach LOS	D			C			C			D		
d_I, Intersection Delay [s/veh]	34.07											
Intersection LOS	C											
Intersection V/C	0.745											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.594	2.605	3.074	3.020
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	380	340	340	700
d_b, Bicycle Delay [s]	32.81	34.45	34.45	21.13
l_b,int, Bicycle LOS Score for Intersection	2.743	2.767	2.319	2.420
Bicycle LOS	B	C	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	469.8
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	4.414

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	40	667	22	28	526	25	78	90	38	47	124	57
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	3	54	19	9	6	9	0	4	2	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	829	30	88	661	40	101	119	46	61	153	83
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	207	8	22	165	10	25	30	12	15	38	21
Total Analysis Volume [veh/h]	49	829	30	88	661	40	101	119	46	61	153	83
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	24	0	0	24	0	0	76	0	0	76	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	20	20	20	20	72	72	72	72
g / C, Green / Cycle	0.20	0.20	0.20	0.20	0.72	0.72	0.72	0.72
(v / s)_i Volume / Saturation Flow Rate	0.06	0.45	0.13	0.37	3.52	0.03	1.61	0.05
s, saturation flow rate [veh/h]	757	1888	653	1881	63	1615	133	1615
c, Capacity [veh/h]	72	380	72	378	97	1161	142	1161
d1, Uniform Delay [s]	50.00	39.95	50.00	39.95	32.99	4.06	37.46	4.16
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	41.28	576.62	177.40	394.25	596.84	0.01	262.09	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.68	2.26	1.22	1.85	2.26	0.04	1.51	0.07
d, Delay for Lane Group [s/veh]	91.28	616.57	227.40	434.20	629.82	4.08	299.55	4.19
Lane Group LOS	F	F	F	F	F	A	F	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.05	69.99	5.34	50.56	17.12	0.24	12.53	0.44
50th-Percentile Queue Length [ft/ln]	51.15	1749.66	133.53	1263.99	427.88	5.92	313.30	10.94
95th-Percentile Queue Length [veh/ln]	3.68	109.31	9.61	78.68	30.81	0.43	22.56	0.79
95th-Percentile Queue Length [ft/ln]	92.07	2732.63	240.35	1966.93	770.18	10.66	563.94	19.70

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	91.28	616.57	616.57	227.40	434.20	434.20	629.82	629.82	4.08	299.55	299.55	4.19
Movement LOS	F	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	588.22			411.13			521.61			217.00		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	469.77											
Intersection LOS	F											
Intersection V/C	4.414											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.631	2.719	2.180	2.244
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	400	400	1440	1440
d_b, Bicycle Delay [s]	32.00	32.00	3.92	3.92
l_b,int, Bicycle LOS Score for Intersection	3.058	2.861	1.999	2.050
Bicycle LOS	C	C	A	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	39.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.821

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	86	1069	170	281	1098	137	120	544	75	105	1052	358
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	21	1	0	46	0	0	1	8	5	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	107	1325	208	343	1386	167	146	665	100	133	1284	437
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	331	52	86	347	42	37	166	25	33	321	109
Total Analysis Volume [veh/h]	107	1325	208	343	1386	167	146	665	100	133	1284	437
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	33	36	0	18	21	0	14	21	0	25	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	33	33	14	40	40	10	28	28	9	27	27	27
g / C, Green / Cycle	0.08	0.33	0.33	0.14	0.40	0.40	0.10	0.28	0.28	0.09	0.27	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.06	0.28	0.28	0.13	0.29	0.29	0.08	0.14	0.14	0.07	0.24	0.24	0.24
s, saturation flow rate [veh/h]	1810	3618	1771	2663	3618	1798	1810	3618	1776	1810	3618	1869	1615
c, Capacity [veh/h]	138	1203	589	373	1434	712	177	996	489	167	975	504	435
d1, Uniform Delay [s]	45.36	31.15	31.17	42.46	25.55	25.60	44.28	30.61	30.66	44.51	35.22	35.23	35.34
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.31	0.32
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.84	7.89	14.81	9.35	3.19	6.37	9.16	0.41	0.85	8.41	3.25	14.75	17.83
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.77	0.86	0.86	0.92	0.72	0.73	0.82	0.51	0.52	0.80	0.90	0.90	0.91
d, Delay for Lane Group [s/veh]	54.20	39.04	45.97	51.81	28.74	31.97	53.44	31.02	31.51	52.92	38.47	49.98	53.17
Lane Group LOS	D	D	D	D	C	C	D	C	C	D	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.93	12.59	13.48	4.62	10.73	11.36	3.97	5.19	5.21	3.60	10.46	12.44	11.24
50th-Percentile Queue Length [ft/ln]	73.28	314.77	336.90	115.52	268.15	283.92	99.37	129.72	130.25	89.95	261.6	310.9	280.9
95th-Percentile Queue Length [veh/ln]	5.28	18.41	19.50	8.15	16.10	16.88	7.15	8.92	8.95	6.48	15.77	18.22	16.73
95th-Percentile Queue Length [ft/ln]	131.90	460.25	487.41	203.66	402.43	422.09	178.87	223.11	223.84	161.9	394.2	455.5	418.3

Movement, Approach, & Intersection Results

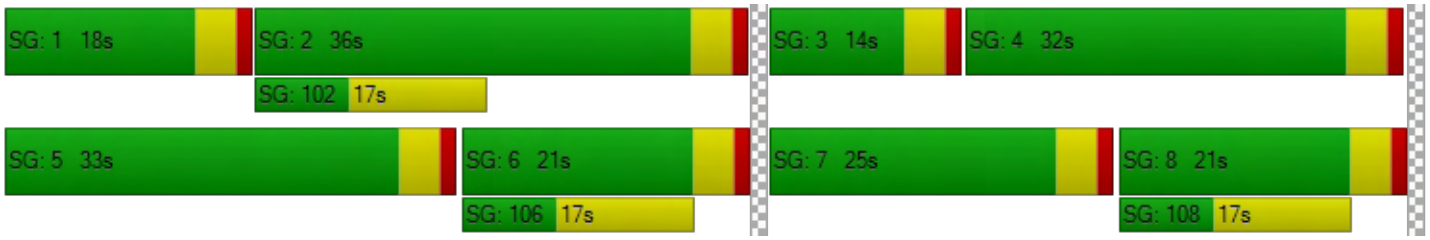
d_M, Delay for Movement [s/veh]	54.20	40.59	45.97	51.81	29.56	31.97	53.44	31.14	31.51	52.92	42.14	53.12
Movement LOS	D	D	D	D	C	C	D	C	C	D	D	D
d_A, Approach Delay [s/veh]	42.16			33.79			34.75			45.44		
Approach LOS	D			C			C			D		
d_I, Intersection Delay [s/veh]	39.54											
Intersection LOS	D											
Intersection V/C	0.821											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	0.00	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.127	0.000	2.943	3.104
Crosswalk LOS	C	F	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	640	340	340	560
d_b, Bicycle Delay [s]	23.12	34.45	34.45	25.92
l_b,int, Bicycle LOS Score for Intersection	2.462	2.602	2.061	2.579
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	38.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.767

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	167	1031	161	149	765	147	177	836	85	231	1124	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	24	28	31	0	1	28	0	51	10	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	204	1273	220	210	964	179	217	1048	104	333	1381	150
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	318	55	53	241	45	54	262	26	83	345	38
Total Analysis Volume [veh/h]	204	1273	220	210	964	179	217	1048	104	333	1381	150
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	28	35	35	14	21	0	14	33	0	18	37	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	13	33	51	10	30	30	10	27	27	14	31	31
g / C, Green / Cycle	0.13	0.33	0.51	0.10	0.30	0.30	0.10	0.27	0.27	0.14	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.11	0.25	0.14	0.08	0.21	0.21	0.08	0.21	0.21	0.13	0.28	0.28
s, saturation flow rate [veh/h]	1810	5176	1615	2663	3618	1752	2663	3618	1813	2663	3618	1806
c, Capacity [veh/h]	242	1717	827	261	1071	519	268	976	489	374	1121	560
d1, Uniform Delay [s]	42.33	29.65	13.79	44.22	31.53	31.53	44.11	33.88	33.88	42.28	33.21	33.26
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.24	0.11	0.11	0.35
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.71	2.93	0.79	5.73	4.17	8.35	5.84	1.44	6.01	7.35	3.24	16.74
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.84	0.74	0.27	0.80	0.72	0.72	0.81	0.79	0.79	0.89	0.91	0.91
d, Delay for Lane Group [s/veh]	50.04	32.57	14.58	49.95	35.69	39.88	49.95	35.32	39.89	49.63	36.45	50.00
Lane Group LOS	D	C	B	D	D	D	D	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	5.39	9.30	2.90	2.74	8.78	9.11	2.83	8.66	9.31	4.38	12.06	14.21
50th-Percentile Queue Length [ft/ln]	134.85	232.44	72.56	68.46	219.57	227.80	70.78	216.58	232.74	109.52	301.52	355.15
95th-Percentile Queue Length [veh/ln]	9.20	14.30	5.22	4.93	13.64	14.06	5.10	13.49	14.31	7.81	17.76	20.39
95th-Percentile Queue Length [ft/ln]	230.08	357.46	130.60	123.23	341.08	351.56	127.41	337.26	357.83	195.34	443.91	509.69

Movement, Approach, & Intersection Results

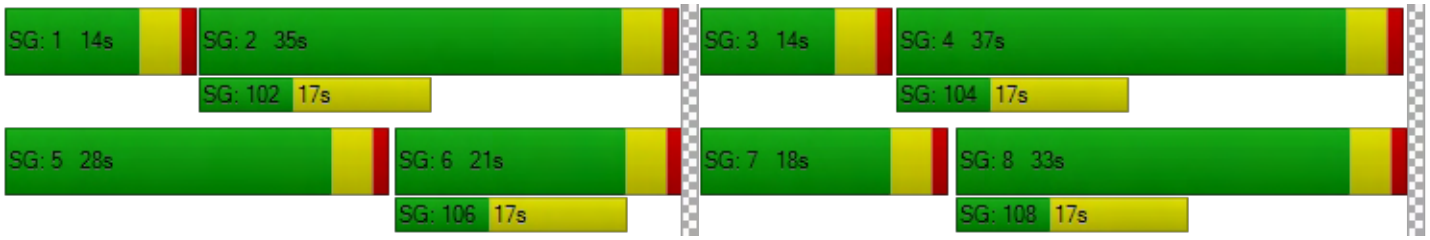
d_M, Delay for Movement [s/veh]	50.04	32.57	14.58	49.95	36.53	39.88	49.95	36.54	39.89	49.63	40.00	50.00
Movement LOS	D	C	B	D	D	D	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	32.34			39.06			38.92			42.52		
Approach LOS	C			D			D			D		
d_I, Intersection Delay [s/veh]	38.24											
Intersection LOS	D											
Intersection V/C	0.767											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.108	3.095	3.112	3.138
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	620	340	580	660
d_b, Bicycle Delay [s]	23.81	34.45	25.21	22.45
l_b,int, Bicycle LOS Score for Intersection	2.493	2.304	2.313	2.585
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	377.9
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	3.533

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	20	16	5	11	3	0	3	8	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	711	53	51	691	53	82	97	50	77	167	103
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	178	13	13	173	13	21	24	13	19	42	26
Total Analysis Volume [veh/h]	60	711	53	51	691	53	82	97	50	77	167	103
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	26	0	0	26	0	0	74	0	0	74	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	22	22	70	70	70	70
g / C, Green / Cycle	0.22	0.22	0.22	0.22	0.70	0.70	0.70	0.70
(v / s)_i Volume / Saturation Flow Rate	0.08	0.41	0.07	0.40	2.77	0.03	2.06	0.06
s, saturation flow rate [veh/h]	728	1877	714	1876	65	1615	118	1615
c, Capacity [veh/h]	72	416	72	416	98	1128	130	1128
d1, Uniform Delay [s]	50.00	38.93	50.00	38.93	31.92	4.69	36.01	4.85
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	66.23	386.33	45.11	365.22	412.34	0.02	422.74	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.83	1.84	0.71	1.79	1.83	0.04	1.88	0.09
d, Delay for Lane Group [s/veh]	116.23	425.25	95.11	404.15	444.26	4.71	458.75	4.89
Lane Group LOS	F	F	F	F	F	A	F	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.82	54.63	2.17	52.17	12.13	0.29	17.15	0.61
50th-Percentile Queue Length [ft/ln]	70.47	1365.67	54.31	1304.33	303.29	7.18	428.67	15.31
95th-Percentile Queue Length [veh/ln]	5.07	84.97	3.91	81.02	21.84	0.52	30.86	1.10
95th-Percentile Queue Length [ft/ln]	126.85	2124.26	97.75	2025.57	545.93	12.92	771.60	27.57

Movement, Approach, & Intersection Results

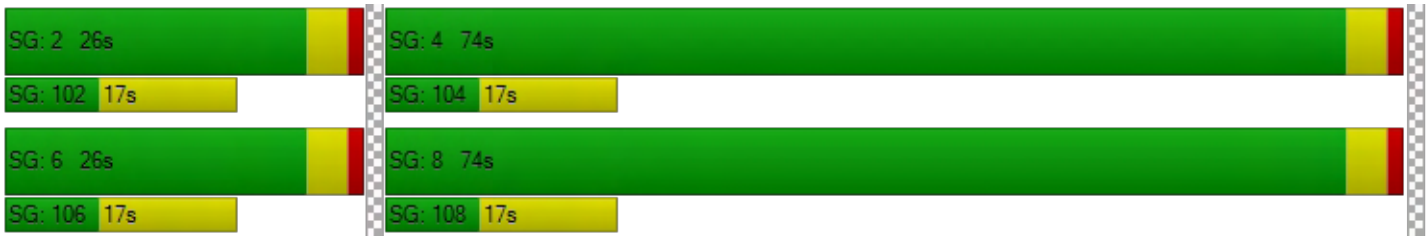
d_M, Delay for Movement [s/veh]	116.23	425.25	425.25	95.11	404.15	404.15	444.26	444.26	4.71	458.75	458.75	4.89
Movement LOS	F	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	402.75			384.32			348.29			324.03		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	377.95											
Intersection LOS	F											
Intersection V/C	3.533											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.646	2.665	2.196	2.196
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	440	440	1400	1400
d_b, Bicycle Delay [s]	30.42	30.42	4.50	4.50
l_b,int, Bicycle LOS Score for Intersection	2.919	2.871	1.937	2.132
Bicycle LOS	C	C	A	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	46.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.885

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	460	101	73	500	67	89	1451	74	135	1077	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	19	34	0	16	17	5	3	22	8	0	29	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	81	595	123	105	627	87	112	1792	98	165	1343	107
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	149	31	26	157	22	28	448	25	41	336	27
Total Analysis Volume [veh/h]	81	595	123	105	627	87	112	1792	98	165	1343	107
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	26	36	0	11	21	0	12	39	0	14	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	43	32	43	33	33	8	35	35	10	37	37
g / C, Green / Cycle	0.43	0.32	0.43	0.33	0.33	0.08	0.35	0.35	0.10	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.08	0.31	0.10	0.33	0.05	0.06	0.35	0.35	0.09	0.27	0.27
s, saturation flow rate [veh/h]	1003	1900	1030	1900	1615	1810	3618	1850	1810	3618	1829
c, Capacity [veh/h]	277	618	299	624	531	140	1261	645	181	1343	679
d1, Uniform Delay [s]	22.74	33.17	22.42	33.57	23.82	45.37	32.42	32.48	44.56	26.95	26.95
k, delay calibration	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.45	0.11	0.11	0.25
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.67	28.24	0.70	37.02	0.66	9.97	9.79	32.26	15.78	0.73	3.26
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.29	0.96	0.35	1.00	0.16	0.80	0.99	0.99	0.91	0.72	0.72
d, Delay for Lane Group [s/veh]	25.41	61.40	23.12	70.59	24.49	55.34	42.21	64.74	60.35	27.68	30.21
Lane Group LOS	C	E	C	F	C	E	D	E	E	C	C
Critical Lane Group	Yes	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.30	18.60	1.50	21.10	1.55	3.10	16.21	20.68	4.81	9.69	10.28
50th-Percentile Queue Length [ft/ln]	32.54	465.07	37.49	527.53	38.73	77.59	405.16	517.11	120.24	242.30	257.06
95th-Percentile Queue Length [veh/ln]	2.34	25.68	2.70	28.71	2.79	5.59	22.81	28.14	8.41	14.80	15.54
95th-Percentile Queue Length [ft/ln]	58.58	641.90	67.47	717.87	69.71	139.67	570.22	703.58	210.15	369.94	388.54

Movement, Approach, & Intersection Results

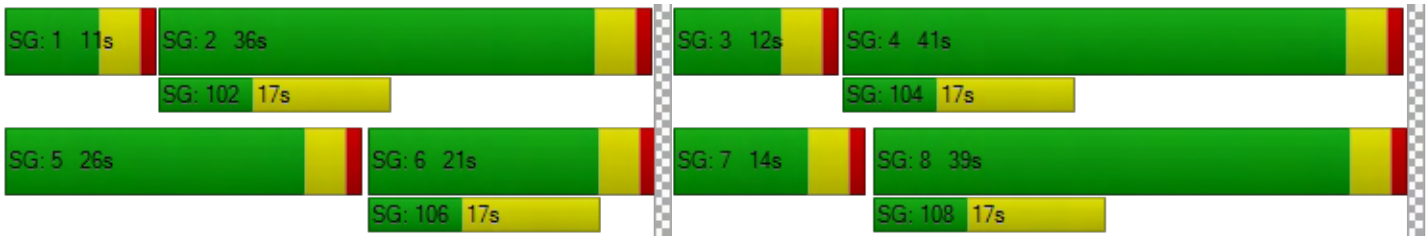
d_M, Delay for Movement [s/veh]	25.41	61.40	0.00	23.12	70.59	24.49	55.34	49.04	64.74	60.35	28.39	30.21
Movement LOS	C	E		C	F	C	E	D	E	E	C	C
d_A, Approach Delay [s/veh]	57.09			59.61			50.16			31.78		
Approach LOS	E			E			D			C		
d_I, Intersection Delay [s/veh]	46.78											
Intersection LOS	D											
Intersection V/C	0.885											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.610	2.623	3.128	3.139
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	640	340	700	740
d_b, Bicycle Delay [s]	23.12	34.45	21.13	19.85
l_b,int, Bicycle LOS Score for Intersection	2.675	2.911	2.661	2.448
Bicycle LOS	B	C	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	182.9
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.850

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	31	563	33	27	592	43	36	107	30	42	103	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	20	16	5	11	3	0	3	8	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	710	43	53	738	57	55	134	37	54	134	89
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	178	11	13	185	14	14	34	9	14	34	22
Total Analysis Volume [veh/h]	38	710	43	53	738	57	55	134	37	54	134	89
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	35	0	0	35	0	0	65	0	0	65	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	31	31	31	31	61	61	61	61
g / C, Green / Cycle	0.31	0.31	0.31	0.31	0.61	0.61	0.61	0.61
(v / s)_i Volume / Saturation Flow Rate	0.05	0.40	0.07	0.42	1.24	0.02	1.21	0.06
s, saturation flow rate [veh/h]	694	1881	721	1876	152	1615	155	1615
c, Capacity [veh/h]	72	587	72	585	139	982	141	982
d1, Uniform Delay [s]	50.00	34.41	50.00	34.41	33.65	7.86	33.79	8.12
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	24.98	140.33	49.19	172.39	201.01	0.02	191.72	0.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.53	1.28	0.74	1.36	1.36	0.04	1.34	0.09
d, Delay for Lane Group [s/veh]	74.98	174.74	99.19	206.80	234.67	7.87	225.51	8.16
Lane Group LOS	E	F	F	F	F	A	F	A
Critical Lane Group	No	No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	1.45	36.72	2.30	41.84	9.90	0.31	9.67	0.76
50th-Percentile Queue Length [ft/ln]	36.14	918.02	57.59	1045.94	247.50	7.66	241.69	19.05
95th-Percentile Queue Length [veh/ln]	2.60	53.97	4.15	62.29	17.82	0.55	17.40	1.37
95th-Percentile Queue Length [ft/ln]	65.06	1349.17	103.67	1557.26	445.50	13.78	435.04	34.28

Movement, Approach, & Intersection Results

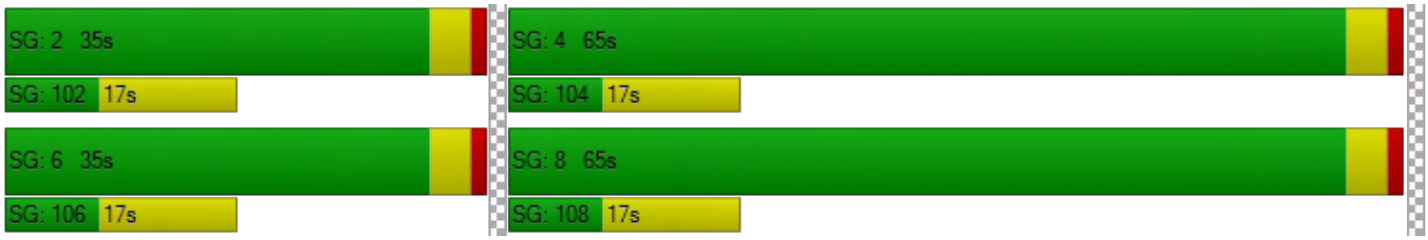
d_M, Delay for Movement [s/veh]	74.98	174.74	174.74	99.19	206.80	206.80	234.67	234.67	7.87	225.51	225.51	8.16
Movement LOS	E	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	169.95			200.07			197.54			155.68		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	182.94											
Intersection LOS	F											
Intersection V/C	1.850											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.608	2.629	2.147	2.185
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	620	620	1220	1220
d_b, Bicycle Delay [s]	23.81	23.81	7.61	7.61
l_b,int, Bicycle LOS Score for Intersection	2.865	2.959	1.933	2.017
Bicycle LOS	C	C	A	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	27.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.755

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	73	495	277	80	499	97	84	1383	105	183	879	79
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	2	0	6	13	18	22	0	7	50	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	612	340	98	615	131	120	1709	128	230	1122	96
Peak Hour Factor	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	157	87	25	158	34	31	438	33	59	287	25
Total Analysis Volume [veh/h]	91	627	348	100	630	134	123	1751	131	236	1150	98
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	13	41	0	18	46	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	27	45	27	27	27	8	37	37	14	43	43
g / C, Green / Cycle	0.30	0.30	0.50	0.30	0.30	0.30	0.09	0.41	0.41	0.16	0.48	0.48
(v / s)_i Volume / Saturation Flow Rate	0.11	0.17	0.22	0.12	0.17	0.08	0.07	0.34	0.35	0.13	0.23	0.23
s, saturation flow rate [veh/h]	809	3618	1615	811	3618	1615	1810	3618	1833	1810	3618	1825
c, Capacity [veh/h]	185	1085	806	186	1085	484	157	1490	755	280	1737	876
d1, Uniform Delay [s]	38.42	26.70	14.39	38.82	26.73	24.07	40.32	23.78	23.84	36.99	15.79	15.79
k, delay calibration	0.11	0.11	0.19	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.02	0.49	0.65	2.40	0.49	0.31	8.31	5.75	10.93	6.73	0.94	1.86
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.49	0.58	0.43	0.54	0.58	0.28	0.78	0.84	0.84	0.84	0.48	0.48
d, Delay for Lane Group [s/veh]	40.43	27.19	15.04	41.22	27.23	24.38	48.62	29.52	34.77	43.73	16.74	17.66
Lane Group LOS	D	C	B	D	C	C	D	C	C	D	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.02	5.53	4.32	2.28	5.65	2.18	2.97	12.23	13.57	5.42	5.54	5.81
50th-Percentile Queue Length [ft/ln]	50.40	138.36	107.96	56.88	141.33	54.46	74.22	305.79	339.25	135.39	138.54	145.35
95th-Percentile Queue Length [veh/ln]	3.63	9.39	7.73	4.10	9.55	3.92	5.34	17.97	19.61	9.23	9.40	9.77
95th-Percentile Queue Length [ft/ln]	90.73	234.81	193.16	102.38	238.81	98.03	133.60	449.19	490.28	230.81	235.05	244.21

Movement, Approach, & Intersection Results

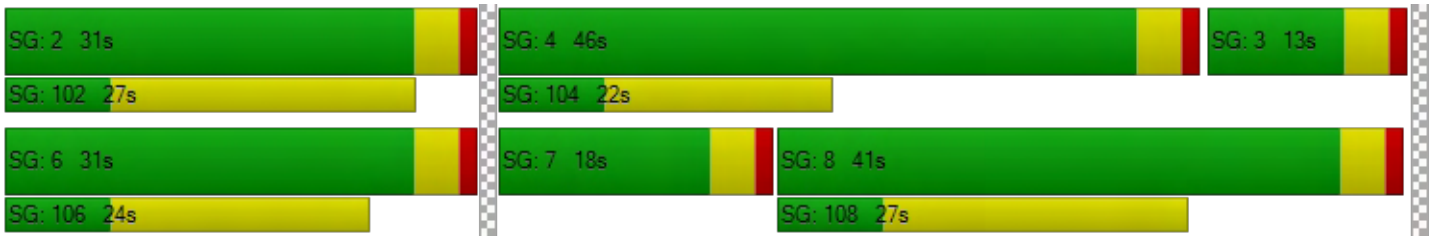
d_M, Delay for Movement [s/veh]	40.43	27.19	15.04	41.22	27.23	24.38	48.62	31.03	34.77	43.73	16.99	17.66
Movement LOS	D	C	B	D	C	C	D	C	C	D	B	B
d_A, Approach Delay [s/veh]	24.36			28.40			32.36			21.29		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	27.12											
Intersection LOS	C											
Intersection V/C	0.755											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.843	2.731	3.272	3.334
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	600	600	822	933
d_b, Bicycle Delay [s]	22.05	22.05	15.61	12.80
l_b,int, Bicycle LOS Score for Intersection	2.439	2.272	2.662	2.376
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	15.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.754

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	25	106	29	51	134	84	107	1682	54	58	1030	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	27	4	40	14	10	0	0	17	11
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	135	35	89	167	142	145	2062	66	71	1274	85
Peak Hour Factor	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	35	9	23	44	37	38	541	17	19	335	22
Total Analysis Volume [veh/h]	33	142	37	93	175	149	152	2166	69	75	1338	89
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	44.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	34	0	0	34	0	0	56	0	0	56	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	25	25	57	57	57	57	57	57
g / C, Green / Cycle	0.28	0.28	0.64	0.64	0.64	0.64	0.64	0.64
(v / s)_i Volume / Saturation Flow Rate	0.13	0.26	0.40	0.41	0.41	0.43	0.26	0.26
s, saturation flow rate [veh/h]	1616	1635	381	3618	1870	174	3618	1840
c, Capacity [veh/h]	491	499	265	2300	1189	143	2300	1170
d1, Uniform Delay [s]	26.69	31.50	19.83	10.04	10.08	31.23	8.07	8.07
k, delay calibration	0.11	0.28	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.60	9.10	8.74	1.37	2.68	13.06	0.55	1.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.43	0.84	0.57	0.64	0.64	0.52	0.41	0.41
d, Delay for Lane Group [s/veh]	27.29	40.60	28.57	11.41	12.77	44.29	8.62	9.14
Lane Group LOS	C	D	C	B	B	D	A	A
Critical Lane Group	No	Yes	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.73	9.76	3.17	8.14	8.94	2.18	4.16	4.40
50th-Percentile Queue Length [ft/ln]	93.21	244.04	79.20	203.55	223.42	54.42	103.95	110.00
95th-Percentile Queue Length [veh/ln]	6.71	14.89	5.70	12.82	13.84	3.92	7.48	7.84
95th-Percentile Queue Length [ft/ln]	167.77	372.14	142.57	320.54	345.98	97.96	187.11	196.01

Movement, Approach, & Intersection Results

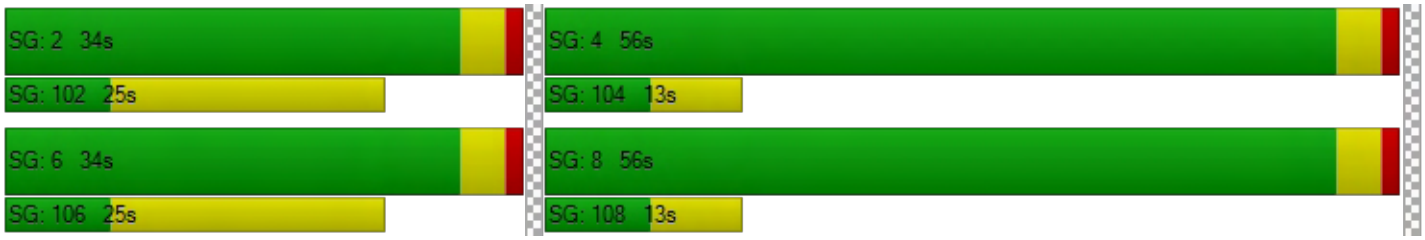
d_M, Delay for Movement [s/veh]	27.29	27.29	27.29	40.60	40.60	40.60	28.57	11.85	12.77	44.29	8.77	9.14
Movement LOS	C	C	C	D	D	D	C	B	B	D	A	A
d_A, Approach Delay [s/veh]	27.29			40.60			12.94			10.57		
Approach LOS	C			D			B			B		
d_I, Intersection Delay [s/veh]	15.38											
Intersection LOS	B											
Intersection V/C	0.754											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.080	2.416	3.185	3.255
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	667	667	1156	1156
d_b, Bicycle Delay [s]	20.00	20.00	8.02	8.02
l_b,int, Bicycle LOS Score for Intersection	1.909	2.248	2.872	2.386
Bicycle LOS	A	B	C	B

Sequence

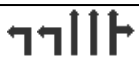
Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	38.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.789

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	1170	144	228	1250	109	155	916	128	93	656	368
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	43	5	0	28	0	0	2	4	2	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	128	1470	181	278	1553	133	189	1120	160	115	801	449
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	368	45	70	388	33	47	280	40	29	200	112
Total Analysis Volume [veh/h]	128	1470	181	278	1553	133	189	1120	160	115	801	449
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	19	24	0	16	21	0	16	21	0	39	44	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	36	36	12	39	39	12	28	28	8	24	24	24
g / C, Green / Cycle	0.09	0.36	0.36	0.12	0.39	0.39	0.12	0.28	0.28	0.08	0.24	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.07	0.30	0.31	0.10	0.31	0.31	0.10	0.24	0.24	0.06	0.18	0.18	0.18
s, saturation flow rate [veh/h]	1810	3618	1795	2663	3618	1824	1810	3618	1781	1810	3618	1743	1615
c, Capacity [veh/h]	161	1293	642	321	1407	710	218	1013	499	149	874	421	390
d1, Uniform Delay [s]	44.72	29.73	29.77	43.24	27.06	27.12	43.24	34.02	34.02	45.04	35.08	35.08	35.08
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.12	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.57	7.25	13.65	7.01	4.72	9.15	9.93	2.06	4.62	8.26	1.26	2.59	2.79
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.79	0.85	0.85	0.87	0.80	0.80	0.87	0.85	0.85	0.77	0.74	0.74	0.74
d, Delay for Lane Group [s/veh]	53.28	36.98	43.42	50.25	31.78	36.27	53.18	36.08	38.64	53.30	36.34	37.67	37.88
Lane Group LOS	D	D	D	D	C	D	D	D	D	D	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	3.48	13.15	14.24	3.66	12.32	13.38	5.15	9.92	10.13	3.12	7.34	7.23	6.73
50th-Percentile Queue Length [ft/ln]	86.90	328.85	356.07	91.51	307.93	334.41	128.85	248.10	253.14	78.04	183.5	180.8	168.1
95th-Percentile Queue Length [veh/ln]	6.26	19.10	20.43	6.59	18.07	19.37	8.88	15.09	15.34	5.62	11.79	11.64	10.98
95th-Percentile Queue Length [ft/ln]	156.41	477.55	510.80	164.72	451.82	484.37	221.93	377.26	383.61	140.4	294.6	291.1	274.5

Movement, Approach, & Intersection Results

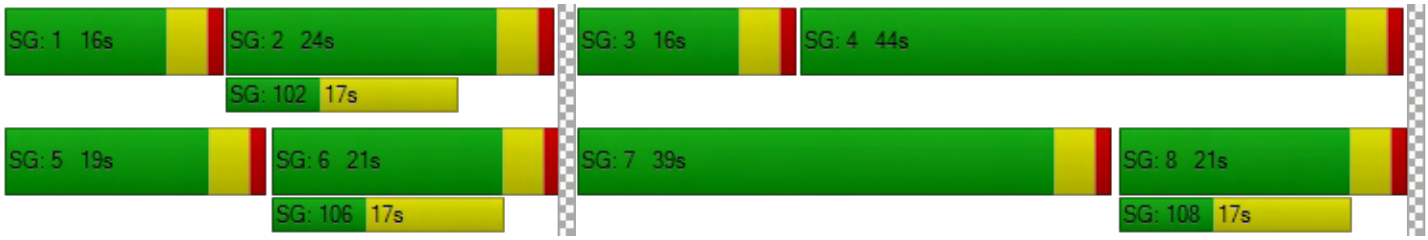
d_M, Delay for Movement [s/veh]	53.28	38.59	43.42	50.25	33.04	36.27	53.18	36.68	38.64	53.30	36.59	37.81
Movement LOS	D	D	D	D	C	D	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	40.14			35.69			39.01			38.40		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	38.20											
Intersection LOS	D											
Intersection V/C	0.789											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	0.00	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.170	0.000	2.951	3.089
Crosswalk LOS	C	F	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	400	340	340	800
d_b, Bicycle Delay [s]	32.00	34.45	34.45	18.00
l_b,int, Bicycle LOS Score for Intersection	2.538	2.640	2.368	2.310
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	54.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.957

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	166	835	219	303	980	183	211	1292	132	318	990	175
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	28	43	13	20	1	0	15	0	27	29	28
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	203	1047	310	383	1216	224	257	1591	161	415	1237	242
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	262	78	96	304	56	64	398	40	104	309	61
Total Analysis Volume [veh/h]	203	1047	310	383	1216	224	257	1591	161	415	1237	242
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	26	26	19	30	0	15	36	0	19	40	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	22	41	15	26	26	11	32	32	15	36	36
g / C, Green / Cycle	0.11	0.22	0.41	0.15	0.26	0.26	0.11	0.32	0.32	0.15	0.36	0.36
(v / s)_i Volume / Saturation Flow Rate	0.11	0.20	0.19	0.14	0.27	0.27	0.10	0.32	0.32	0.16	0.28	0.28
s, saturation flow rate [veh/h]	1810	5176	1615	2663	3618	1753	2663	3618	1812	2663	3618	1746
c, Capacity [veh/h]	199	1147	665	400	947	459	293	1151	577	400	1296	625
d1, Uniform Delay [s]	44.51	37.98	21.42	42.20	36.93	36.93	43.84	34.10	34.10	42.51	28.43	28.51
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.46	0.11	0.11	0.29
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	34.35	12.43	2.34	13.12	35.26	49.40	8.17	15.35	40.85	31.57	0.99	5.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.02	0.91	0.47	0.96	1.02	1.03	0.88	1.01	1.02	1.04	0.77	0.77
d, Delay for Lane Group [s/veh]	78.86	50.42	23.76	55.32	72.19	86.33	52.01	49.46	74.95	74.08	29.41	33.90
Lane Group LOS	F	D	C	E	F	F	D	F	F	F	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	6.79	9.53	5.60	5.36	15.95	17.26	3.44	15.99	20.10	6.63	10.42	10.92
50th-Percentile Queue Length [ft/ln]	169.85	238.22	140.11	134.12	398.71	431.46	85.98	399.75	502.62	165.69	260.56	273.12
95th-Percentile Queue Length [veh/ln]	11.15	14.59	9.49	9.16	22.81	24.48	6.19	22.72	27.80	11.03	15.72	16.35
95th-Percentile Queue Length [ft/ln]	278.73	364.79	237.17	229.09	570.27	612.01	154.77	568.04	694.92	275.64	392.93	408.64

Movement, Approach, & Intersection Results

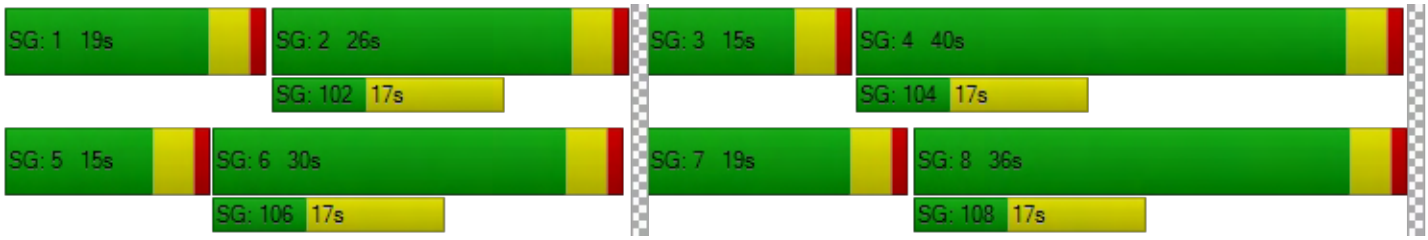
d_M, Delay for Movement [s/veh]	78.86	50.42	23.76	55.32	75.07	86.33	52.01	56.29	74.95	74.08	30.29	33.90
Movement LOS	F	D	C	E	E	F	D	E	E	F	C	C
d_A, Approach Delay [s/veh]	48.82			72.30			57.24			40.35		
Approach LOS	D			E			E			D		
d_I, Intersection Delay [s/veh]	54.81											
Intersection LOS	D											
Intersection V/C	0.957											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.139	3.141	3.178	3.239
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	440	520	640	720
d_b, Bicycle Delay [s]	30.42	27.38	23.12	20.48
l_b,int, Bicycle LOS Score for Intersection	2.418	2.562	2.665	2.601
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 20: Cherry Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	30.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.794

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	118.00	135.00	100.00	100.00	180.00	100.00	100.00	186.00	100.00	100.00
Speed [mph]	30.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	78	419	41	185	588	235	195	1413	78	72	891	170
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	5	0	8	3	0	0	30	7	0	26	14
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	97	516	50	234	720	287	238	1754	102	88	1113	221
Peak Hour Factor	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	132	13	60	184	74	61	449	26	23	285	57
Total Analysis Volume [veh/h]	99	529	51	240	738	294	244	1797	105	90	1140	226
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	86.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	29	0	11	29	0	18	39	0	11	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	0	0	0	12	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	32	21	21	32	22	22	14	40	40	6	32	32
g / C, Green / Cycle	0.36	0.23	0.23	0.36	0.24	0.24	0.16	0.44	0.44	0.07	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.10	0.15	0.16	0.21	0.20	0.18	0.13	0.35	0.35	0.05	0.25	0.25
s, saturation flow rate [veh/h]	1018	1900	1842	1120	3618	1615	1810	3618	1847	1810	3618	1743
c, Capacity [veh/h]	335	442	429	392	865	386	284	1593	813	128	1282	618
d1, Uniform Delay [s]	21.91	31.39	31.41	22.96	32.79	31.91	37.06	21.64	21.71	40.98	25.23	25.23
k, delay calibration	0.11	0.11	0.11	0.19	0.11	0.12	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.49	1.72	1.79	2.70	2.51	3.40	7.52	4.05	7.85	6.86	3.50	7.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.30	0.66	0.67	0.61	0.85	0.76	0.86	0.79	0.79	0.70	0.72	0.72
d, Delay for Lane Group [s/veh]	22.39	33.12	33.20	25.66	35.30	35.31	44.58	25.68	29.55	47.83	28.73	32.29
Lane Group LOS	C	C	C	C	D	D	D	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.43	5.88	5.73	3.95	7.78	6.17	5.67	11.38	12.58	2.15	8.69	8.99
50th-Percentile Queue Length [ft/ln]	35.77	147.05	143.22	98.86	194.55	154.13	141.75	284.46	314.49	53.82	217.31	224.77
95th-Percentile Queue Length [veh/ln]	2.58	9.86	9.65	7.12	12.36	10.24	9.57	16.91	18.40	3.88	13.53	13.91
95th-Percentile Queue Length [ft/ln]	64.38	246.49	241.36	177.94	308.93	255.93	239.37	422.76	459.90	96.88	338.20	347.71

Movement, Approach, & Intersection Results

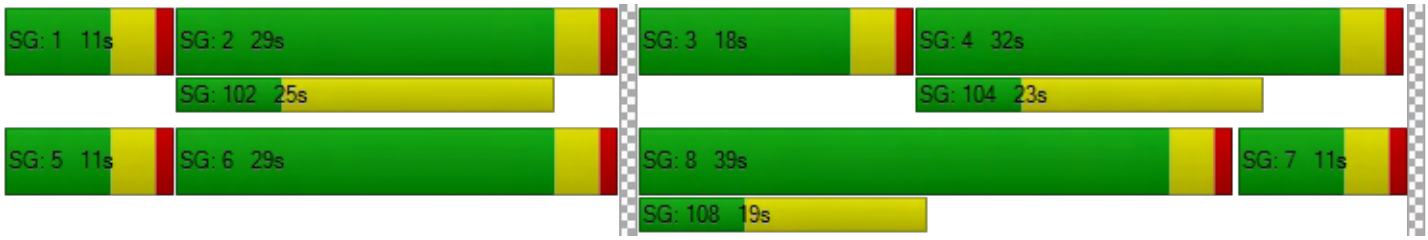
d_M, Delay for Movement [s/veh]	22.39	33.15	33.20	25.66	35.30	35.31	44.58	26.85	29.55	47.83	29.41	32.29
Movement LOS	C	C	C	C	D	D	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	31.59			33.49			28.99			31.00		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	30.87											
Intersection LOS	C											
Intersection V/C	0.794											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.614	2.821	0.000	3.257
Crosswalk LOS	B	C	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	556	556	778	622
d_b, Bicycle Delay [s]	23.47	23.47	16.81	21.36
l_b,int, Bicycle LOS Score for Intersection	2.120	2.609	2.740	2.360
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



KUNZMAN ASSOCIATES, INC.

SIGNAL HILL BUSINESS CENTER

SUPPLEMENTAL TRAFFIC ANALYSIS

March 12, 2018
Revised May 31, 2018

Traffic Engineering | Transportation Planning | Parking | Noise/Vibration | Expert Witness
Air Quality | Global Climate Change | Health Risk Assessment

May 31, 2018

Mr. Steven Christie, Development Manager
XEBEC REALTY PARTNERS
3010 Old Ranch Parkway, Suite 470
Seal Beach, CA 90740

Dear Mr. Christie:

INTRODUCTION

The firm of Kunzman Associates, Inc. is pleased to provide this supplemental traffic analysis for the proposed Signal Hill Business Center project in the City of Signal Hill. The purpose of this supplemental analysis is to assess potential traffic impacts associated with the proposed project during the afternoon school peak hour.

This traffic analysis supplements the Signal Hill Business Center Traffic Impact Analysis prepared by Kunzman Associates, Inc. (Revised May 31, 2018). The project site is generally bounded by Gundry Avenue to the west, Gundry Hill Apartments and American University of Health Sciences to the north, Gaviota Avenue to the east, and the Signal Hill City Limits and Alamitos Avenue to the south. The project site is currently vacant. The project site is proposed to consist of developing the project site with a business park consisting of nine buildings totaling 139,080 square feet plus 12,000 square feet of mezzanine, for a total of 151,080 square feet of gross floor area. Full access driveways are proposed at Gundry Avenue, Walnut Avenue, and Alamitos Avenue. The proposed project is anticipated to be constructed and fully operational by Year 2019.

Although this is a technical report, every effort has been made to write the report clearly and concisely. To assist the reader with those terms unique to transportation engineering, a glossary of terms is provided within Appendix A.

PROJECT TRIP GENERATION

Table 1 summarizes the afternoon peak hour project trip generation used in this analysis. As shown in Table 1, the proposed project is forecast to generate approximately 246 trips during the afternoon school peak hour. Figure 1 shows the project-generated afternoon peak hour intersection turning movement volumes based on the project trip distribution patterns identified in the Signal Hill Business Center Traffic Impact Analysis.

The project trip generation forecast is based upon regression equations obtained from the Institute of Transportation Engineers, Trip Generation Manual, 10th Edition, 2017. The Trip Generation Manual does not provide trip generation equations/rates for the afternoon school peak hour beginning at

approximately 2:15 PM to 2:30 PM. Therefore, the evening peak hour project trip generation calculated and used in the Signal Hill Business Center Traffic Impact Analysis was also used for this analysis. This is a conservative estimate since hourly distribution data contained in the Trip Generation Manual suggests that trips generated by light industrial and general office developments between 2:30 PM and 3:30 PM are approximately 10 to 35 percent lower than trips generated during the evening peak hour of adjacent street traffic.

AFTERNOON SCHOOL PEAK HOUR TRAFFIC VOLUMES

The morning school peak hour is estimated to occur between 7:00 AM and 8:00 AM. The morning school peak hour is accounted for in the Signal Hill Business Center Traffic Impact Analysis since the morning peak period was counted from 7:00 AM to 9:00 AM. The evening peak hour (commuter) generally outweighs school afternoon peak hour trips, especially as distance from the school increases. For this analysis, the study area is focused on the following intersections with yellow school crosswalk markings:

Orange Avenue (NS) at:
- Hill Street (EW) - #4
- Pacific Coast Highway (EW) - #5

Gundry Avenue (NS) at:
- Hill Street (EW) - #6

Walnut Avenue (NS) at:
- Hill Street (EW) - #10
- 20th Street/Alamitos Avenue (EW) - #11
- Pacific Coast Highway (EW) - #12

Cherry Avenue (NS) at:
- 21st Street (EW) - #18
- 20th Street (EW) - #19

Existing Traffic Volumes

Existing afternoon school peak hour traffic volumes are based upon afternoon peak period intersection turning movement counts obtained in February 2018 during typical weekday conditions. Based on review of bell schedules for schools in the project vicinity, the afternoon peak period was counted between 1:30 PM and 3:30 PM. The actual peak hour within the peak period is the four consecutive 15 minute periods with the highest total volume when all movements are added together. Thus, the weekday afternoon peak hour at one intersection may be 2:15 PM to 3:15 PM if those four consecutive 15 minute periods have the highest combined volume. Intersection turning movement count worksheets are provided in Appendix B.

Other Development Traffic Volumes

Similar to the project trip generation, the evening peak hour trip generation for other developments as calculated and used in the Signal Hill Business Center Traffic Impact Analysis was also used for this analysis. Consistent with the Signal Hill Business Center Traffic Impact Analysis, existing afternoon school peak hour traffic volumes were increased by a growth rate of one percent (1%) per year over two years for Opening Year (2020) conditions and over 20 years for General Plan Buildout conditions.

Existing and forecast afternoon school peak hour intersection turning movement volumes are illustrated on Figures 2 through 7.

TRESHOLDS OF SIGNIFICANCE

The significance of project traffic impacts is based on the thresholds identified in the Signal Hill Business Center Traffic Impact Analysis.

City of Signal Hill/City of Long Beach. For signalized study intersections within City of Signal Hill or City of Long jurisdiction, a project traffic impact is considered significant if:

- The addition of project-generated trips is forecast to cause an intersection to deteriorate from acceptable Level of Service (D or better) to unacceptable Level of Service (E or F); or,
- The addition of project-generated trips is forecast to cause an increase in volume-to-capacity of 0.02 or greater when the intersection is operating at unacceptable Level of Service (E or F) in the baseline condition.

California Department of Transportation. Based on the California Department of Transportation established performance standards, a potentially significant traffic impact is defined to occur if the addition of project generated trips is forecast to cause the performance of a State Highway study intersection to change from acceptable operation (Level of Service D or better) to deficient operation (Level of Service E or F).

It should be noted that many jurisdictions, including the Cities of Signal Hill and Long Beach, do not have established significant impact thresholds for unsignalized intersections. For this analysis, a project impact at an unsignalized intersection is considered significant if the addition of project-generated trips is forecast to cause or worsen Level of Service E or F and installation of a traffic signal is warranted.

TRAFFIC IMPACT ASSESSMENT

Existing Plus Project

Tables 2 and 3 show Intersection Capacity Utilization/delay and Levels of Service at the study intersections for Existing and Existing Plus Project traffic conditions. As shown in Tables 2 and 3, the

study intersections operate at acceptable Levels of Service (D or better) for Existing and Existing Plus Project traffic conditions during the afternoon school peak hour.

Table 4 evaluates the project impact at the study intersections for Existing Plus Project traffic conditions. As shown in Table 4, the proposed project is forecast to result in no significant traffic impacts at the study intersections for Existing Plus Project traffic conditions.

Opening Year (2020)

Tables 5 and 6 show Intersection Capacity Utilization/delay and Levels of Service at the study intersections for Opening Year (2020) Without and With Project traffic conditions. As shown in Tables 5 and 6, the study intersections are projected to operate at acceptable Levels of Service (D or better) for Opening Year (2020) Without and With Project traffic conditions during the afternoon school peak hour.

Table 7 evaluates the project impact at the study intersections for Opening Year (2020) With Project traffic conditions. As shown in Table 7, the proposed project is forecast to result in no significant traffic impacts at the study intersections for Opening Year (2020) With Project traffic conditions.

General Plan Buildout (Year 2040)

Tables 8 and 9 show Intersection Capacity Utilization/delay and Levels of Service at the study intersections for General Plan Buildout (Year 2040) Without and With Project traffic conditions. As shown in Tables 8 and 9, the study intersections are projected to operate at acceptable Levels of Service (D or better) for General Plan Buildout (Year 2040) Without and With Project traffic conditions during the afternoon school peak hour, except for the intersection of Walnut Avenue/Hill Street for General Plan Buildout (Year 2040) With Project traffic conditions.

Table 10 evaluates the project impact at the study intersections for General Plan Buildout (Year 2040) With Project traffic conditions. As shown in Table 10, the proposed project is forecast to result in no significant traffic impacts at the study intersections for General Plan Buildout (Year 2040) With Project traffic conditions.

RECOMMENDATIONS

As shown in Table 10, the project impact is forecast to be less than significant at the study intersection of Walnut Avenue/Hill Street because the intersection volumes do not satisfy the peak hour volume traffic signal warrant in accordance with the California Manual on Uniform Traffic Control Devices (2014) ["CA MUTCD"]. However, since the addition of project-generated trips is forecast to cause the Level of Service to degrade from acceptable (D or better) to unacceptable (Level of Service E or F), the following mitigation measure is recommended:

Walnut Avenue/Hill Street - #10

- Extend the no parking restriction on the northbound approach to 100 feet south of the intersection. This will result in the loss of approximately two on-street parking spaces, but will allow for a de facto right turn lane.

With implementation of the proposed mitigation measure at Walnut Avenue/Hill Street, the study intersections are forecast to operate at Level of Service D or better during the afternoon school peak hour.

Appendix D contains the peak hour traffic signal warrant worksheet for the intersection of Walnut Avenue/Hill Street.

CONCLUSIONS

It has been a pleasure to service your needs on this project. Should you have any questions or if we can be of further assistance, please do not hesitate to call at (714) 973-8383.

Sincerely,

KUNZMAN ASSOCIATES, INC.





Giancarlo Ganddini, TE, PTP
Manager of Traffic Engineering

JN 7311

Table 1

Project Trip Generation

Land Use	Source[1]	Setting[2]	Trip Generation Equations[3]	Directional Distribution	
				Inbound	Outbound
Business Park School PM Peak Hour	ITE 770	GU/S	Ln(T) = 0.90 Ln(X) + 0.85	26%	74%

Land Use/Time Period	Quantity	Units[4]	Vehicle Trips Generated		
			Total	Inbound	Outbound
Business Park	151.080	TSF			
School PM Peak Hour			214	56	158
Cars (85%)			182	48	134
Trucks (15%)			32	8	24

Time Period	PCE Factor	PCE Trips Generated[5]		
		Total	Inbound	Outbound
School PM Peak Hour				
Cars	1.0	182	48	134
Trucks	2.0	64	16	48
Total		**246**	**64**	**182**

[1] ITE = Institute of Transportation Engineers, Trip Generation Manual, 10th Edition, 2017; ### = Land Use Code

[2] GU/S = General Urban/Suburban

[3] T = Trips; X = Thousand Square Feet

[4] TSF = Thousand Square Feet

[5] PCE = Passenger Car Equivalent

Table 2

Existing Intersection Capacity Utilization/Delay and Levels of Service

Intersection	Traffic Control[1]	Intersection Approach Lanes[2]												School PM Peak Hour V/C [Delay]-LOS[3]
		Northbound			Southbound			Eastbound			Westbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Orange Avenue (NS) at:														
Hill Street (EW) - #4	TS	1	0.5	0.5	1	0.5	0.5	0.5	0.5	1	0.5	0.5	d	0.656-B
Pacific Coast Highway (EW) - #5	TS	1	2	1>	1	2	1	1	2.5	0.5	1	2.5	0.5	[20.4]-C
Gundry Avenue (NS) at:														
Hill Street (EW) - #6	CSS	0.5	-	0.5	-	-	-	-	0.5	0.5	0.5	0.5	-	[13.2]-B
Walnut Avenue (NS) at:														
Hill Street (EW) - #10	AWS	-	<1>	-	0.5	0.5	1	-	<1>	-	-	<1>	-	[14.8]-B
20th Street/Alamitos Avenue (EW) - #11	TS	1	0.5	0.5	1	0.5	0.5	-	<1>	-	-	<1>	-	0.564-A
Pacific Coast Highway (EW) - #12	TS	-	<1>	-	-	<1>	-	1	2.5	0.5	1	2.5	0.5	[9.9]-A
Cherry Avenue (NS) at:														
21st Street (EW) - #18	TS	1	2	d	1	2	1	0.5	0.5	d	1	0.5	0.5	0.544-A
20th Street (EW) - #19	TS	1	1.5	0.5	1	1.5	0.5	1	0.5	0.5	-	<1>	-	0.475-A

[1] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

[2] L = Left; T = Through; R = Right; d = De Facto Right Turn Lane; <1> = Shared Left/Through/Right Lane; > = Right Turn Overlap

[3] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; [Delay]-LOS is reported for intersections under California Department of Transportation jurisdiction and intersections with stop control. Per the Highway Capacity Manual, overall average intersection delay and LOS are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, Level of Service is based on average delay of the worst individual lane (or movements sharing a lane).

Table 3

Existing Plus Project Intersection Capacity Utilization/Delay and Levels of Service

Intersection	Traffic Control[1]	Intersection Approach Lanes[2]												School PM Peak Hour V/C [Delay]-LOS[3]
		Northbound			Southbound			Eastbound			Westbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Orange Avenue (NS) at:														
Hill Street (EW) - #4	TS	1	0.5	0.5	1	0.5	0.5	0.5	0.5	1	0.5	0.5	d	0.664-B
Pacific Coast Highway (EW) - #5	TS	1	2	1>	1	2	1	1	2.5	0.5	1	2.5	0.5	[20.5]-C
Gundry Avenue (NS) at:														
Hill Street (EW) - #6	CSS	0.5	-	0.5	-	-	-	-	0.5	0.5	0.5	0.5	-	[14.9]-B
Walnut Avenue (NS) at:														
Hill Street (EW) - #10	AWS	-	<1>	-	0.5	0.5	1	-	<1>	-	-	<1>	-	[19.6]-C
20th Street/Alamitos Avenue (EW) - #11	TS	1	0.5	0.5	1	0.5	0.5	-	<1>	-	-	<1>	-	0.578-A
Pacific Coast Highway (EW) - #12	TS	-	<1>	-	-	<1>	-	1	2.5	0.5	1	2.5	0.5	[11.6]-B
Cherry Avenue (NS) at:														
21st Street (EW) - #18	TS	1	2	d	1	2	1	0.5	0.5	d	1	0.5	0.5	0.552-A
20th Street (EW) - #19	TS	1	1.5	0.5	1	1.5	0.5	1	0.5	0.5	-	<1>	-	0.475-A

[1] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

[2] L = Left; T = Through; R = Right; d = De Facto Right Turn Lane; <1> = Shared Left/Through/Right Lane; > = Right Turn Overlap

[3] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; [Delay]-LOS is reported for intersections under California Department of Transportation jurisdiction and intersections with stop control. Per the Highway Capacity Manual, overall average intersection delay and LOS are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, Level of Service is based on average delay of the worst individual lane (or movements sharing a lane).

Table 4

Existing Plus Project Significant Impact Evaluation

Signalized Intersections				
	School PM Peak Hour V/C [Delay]-LOS[1]			
Intersection	Without Project	With Project	Change in V/C or Delay	Significant Impact?
Orange Avenue (NS) at:				
Hill Street (EW) - #4	0.656-B	0.664-B	+0.008	No
Pacific Coast Highway (EW) - #5	[20.4]-C	[20.5]-C	+0.1	No
Walnut Avenue (NS) at:				
20th Street/Alamitos Avenue (EW) - #11	0.564-A	0.578-A	+0.014	No
Pacific Coast Highway (EW) - #12	[9.9]-A	[11.6]-B	+1.7	No
Cherry Avenue (NS) at:				
21st Street (EW) - #18	0.544-A	0.552-A	+0.008	No
20th Street (EW) - #19	0.475-A	0.475-A	0.000	No

Unsignalized Intersections					
	School PM Peak Hour Delay-LOS				
Intersection	Without Project	With Project	Acceptable LOS?	Traffic Signal Warranted?	Significant Impact?
Gundry Avenue (NS) at:					
Hill Street (EW) - #6	13.2-B	14.9-B	Yes	-	No
Walnut Avenue (NS) at:					
Hill Street (EW) - #10	14.8-B	19.6-C	Yes	-	No

[1] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; see Tables 1 and 3.

Table 5

Opening Year (2020) Without Project Intersection Capacity Utilization/Delay and Levels of Service

Intersection	Traffic Control[1]	Intersection Approach Lanes[2]												School PM Peak Hour V/C [Delay]-LOS[3]
		Northbound			Southbound			Eastbound			Westbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Orange Avenue (NS) at:														
Hill Street (EW) - #4	TS	1	0.5	0.5	1	0.5	0.5	0.5	0.5	1	0.5	0.5	d	0.690-B
Pacific Coast Highway (EW) - #5	TS	1	2	1>	1	2	1	1	2.5	0.5	1	2.5	0.5	[21.0]-C
Gundry Avenue (NS) at:														
Hill Street (EW) - #6	CSS	0.5	-	0.5	-	-	-	-	0.5	0.5	0.5	0.5	-	[13.6]-B
Walnut Avenue (NS) at:														
Hill Street (EW) - #10	AWS	-	<1>	-	0.5	0.5	1	-	<1>	-	-	<1>	-	[15.9]-C
20th Street/Alamitos Avenue (EW) - #11	TS	1	0.5	0.5	1	0.5	0.5	-	<1>	-	-	<1>	-	0.576-A
Pacific Coast Highway (EW) - #12	TS	-	<1>	-	-	<1>	-	1	2.5	0.5	1	2.5	0.5	[10.3]-B
Cherry Avenue (NS) at:														
21st Street (EW) - #18	TS	1	2	d	1	2	1	0.5	0.5	d	1	0.5	0.5	0.566-A
20th Street (EW) - #19	TS	1	1.5	0.5	1	1.5	0.5	1	0.5	0.5	-	<1>	-	0.489-A

[1] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

[2] L = Left; T = Through; R = Right; d = De Facto Right Turn Lane; <1> = Shared Left/Through/Right Lane; > = Right Turn Overlap

[3] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; [Delay]-LOS is reported for intersections under California Department of Transportation jurisdiction and intersections with stop control. Per the Highway Capacity Manual, overall average intersection delay and LOS are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, Level of Service is based on average delay of the worst individual lane (or movements sharing a lane).

Table 6

Opening Year (2020) With Project Intersection Capacity Utilization/Delay and Levels of Service

Intersection	Traffic Control[1]	Intersection Approach Lanes[2]												School PM Peak Hour V/C [Delay]-LOS[3]
		Northbound			Southbound			Eastbound			Westbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Orange Avenue (NS) at:														
Hill Street (EW) - #4	TS	1	0.5	0.5	1	0.5	0.5	0.5	0.5	1	0.5	0.5	d	0.703-C
Pacific Coast Highway (EW) - #5	TS	1	2	1>	1	2	1	1	2.5	0.5	1	2.5	0.5	[21.1]-C
Gundry Avenue (NS) at:														
Hill Street (EW) - #6	CSS	0.5	-	0.5	-	-	-	-	0.5	0.5	0.5	0.5	-	[15.5]-C
Walnut Avenue (NS) at:														
Hill Street (EW) - #10	AWS	-	<1>	-	0.5	0.5	1	-	<1>	-	-	<1>	-	[22.2]-C
20th Street/Alamitos Avenue (EW) - #11	TS	1	0.5	0.5	1	0.5	0.5	-	<1>	-	-	<1>	-	0.591-A
Pacific Coast Highway (EW) - #12	TS	-	<1>	-	-	<1>	-	1	2.5	0.5	1	2.5	0.5	[12.1]-B
Cherry Avenue (NS) at:														
21st Street (EW) - #18	TS	1	2	d	1	2	1	0.5	0.5	d	1	0.5	0.5	0.573-A
20th Street (EW) - #19	TS	1	1.5	0.5	1	1.5	0.5	1	0.5	0.5	-	<1>	-	0.489-A

[1] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

[2] L = Left; T = Through; R = Right; d = De Facto Right Turn Lane; <1> = Shared Left/Through/Right Lane; > = Right Turn Overlap

[3] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; [Delay]-LOS is reported for intersections under California Department of Transportation jurisdiction and intersections with stop control. Per the Highway Capacity Manual, overall average intersection delay and LOS are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, Level of Service is based on average delay of the worst individual lane (or movements sharing a lane).

Table 7

Opening Year (2020) Significant Impact Evaluation

Signalized Intersections				
	School PM Peak Hour V/C [Delay]-LOS[1]			
Intersection	Without Project	With Project	Change in V/C or Delay	Significant Impact?
Orange Avenue (NS) at:				
Hill Street (EW) - #4	0.690-B	0.703-C	+0.013	No
Pacific Coast Highway (EW) - #5	[21.0]-C	[21.1]-C	+0.1	No
Walnut Avenue (NS) at:				
20th Street/Alamitos Avenue (EW) - #11	0.576-A	0.591-A	+0.015	No
Pacific Coast Highway (EW) - #12	[10.3]-B	[12.1]-B	+1.8	No
Cherry Avenue (NS) at:				
21st Street (EW) - #18	0.566-A	0.573-A	+0.007	No
20th Street (EW) - #19	0.489-A	0.489-A	0.000	No

Unsignalized Intersections					
	School PM Peak Hour Delay-LOS				
Intersection	Without Project	With Project	Acceptable LOS?	Traffic Signal Warranted?	Significant Impact?
Gundry Avenue (NS) at:					
Hill Street (EW) - #6	13.6-B	15.5-C	Yes	-	No
Walnut Avenue (NS) at:					
Hill Street (EW) - #10	15.9-C	22.2-C	Yes	-	No

[1] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; see Tables 5 and 6.

Table 8

General Plan Buildout (Year 2040) Without Project
Intersection Capacity Utilization/Delay and Levels of Service

Intersection	Traffic Control[1]	Intersection Approach Lanes[2]												School PM Peak Hour V/C [Delay]-LOS[3]
		Northbound			Southbound			Eastbound			Westbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Orange Avenue (NS) at:														
Hill Street (EW) - #4	TS	1	0.5	0.5	1	0.5	0.5	0.5	0.5	1	0.5	0.5	d	0.802-D
Pacific Coast Highway (EW) - #5	TS	1	2	1>	1	2	1	1	2.5	0.5	1	2.5	0.5	[24.0]-C
Gundry Avenue (NS) at:														
Hill Street (EW) - #6	CSS	0.5	-	0.5	-	-	-	-	0.5	0.5	0.5	0.5	-	[15.6]-C
Walnut Avenue (NS) at:														
Hill Street (EW) - #10	AWS	-	<1>	-	0.5	0.5	1	-	<1>	-	-	<1>	-	[29.1]-D
20th Street/Alamitos Avenue (EW) - #11	TS	1	0.5	0.5	1	0.5	0.5	-	<1>	-	-	<1>	-	0.648-B
Pacific Coast Highway (EW) - #12	TS	-	<1>	-	-	<1>	-	1	2.5	0.5	1	2.5	0.5	[12.7]-B
Cherry Avenue (NS) at:														
21st Street (EW) - #18	TS	1	2	d	1	2	1	0.5	0.5	d	1	0.5	0.5	0.655-B
20th Street (EW) - #19	TS	1	1.5	0.5	1	1.5	0.5	1	0.5	0.5	-	<1>	-	0.564-A

[1] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

[2] L = Left; T = Through; R = Right; d = De Facto Right Turn Lane; <1> = Shared Left/Through/Right Lane; > = Right Turn Overlap

[3] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; [Delay]-LOS is reported for intersections under California Department of Transportation jurisdiction and intersections with stop control. Per the Highway Capacity Manual, overall average intersection delay and LOS are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, Level of Service is based on average delay of the worst individual lane (or movements sharing a lane).

Table 9

General Plan Buildout (Year 2040) With Project
Intersection Capacity Utilization/Delay and Levels of Service

Intersection	Traffic Control[1]	Intersection Approach Lanes[2]												School PM Peak Hour V/C [Delay]-LOS[3]
		Northbound			Southbound			Eastbound			Westbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Orange Avenue (NS) at:														
Hill Street (EW) - #4	TS	1	0.5	0.5	1	0.5	0.5	0.5	0.5	1	0.5	0.5	d	0.813-D
Pacific Coast Highway (EW) - #5	TS	1	2	1>	1	2	1	1	2.5	0.5	1	2.5	0.5	[24.2]-C
Gundry Avenue (NS) at:														
Hill Street (EW) - #6	CSS	0.5	-	0.5	-	-	-	-	0.5	0.5	0.5	0.5	-	[18.3]-C
Walnut Avenue (NS) at:														
Hill Street (EW) - #10	AWS	-	<1>	-	0.5	0.5	1	-	<1>	-	-	<1>	-	[48.6]-E
20th Street/Alamitos Avenue (EW) - #11	TS	1	0.5	0.5	1	0.5	0.5	-	<1>	-	-	<1>	-	0.663-B
Pacific Coast Highway (EW) - #12	TS	-	<1>	-	-	<1>	-	1	2.5	0.5	1	2.5	0.5	[15.2]-B
Cherry Avenue (NS) at:														
21st Street (EW) - #18	TS	1	2	d	1	2	1	0.5	0.5	d	1	0.5	0.5	0.662-B
20th Street (EW) - #19	TS	1	1.5	0.5	1	1.5	0.5	1	0.5	0.5	-	<1>	-	0.564-A

[1] TS = Traffic Signal; CSS = Cross Street Stop; AWS = All Way Stop

[2] L = Left; T = Through; R = Right; d = De Facto Right Turn Lane; <1> = Shared Left/Through/Right Lane; > = Right Turn Overlap

[3] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; [Delay]-LOS is reported for intersections under California Department of Transportation jurisdiction and intersections with stop control. Per the Highway Capacity Manual, overall average intersection delay and LOS are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, Level of Service is based on average delay of the worst individual lane (or movements sharing a lane).

Table 10

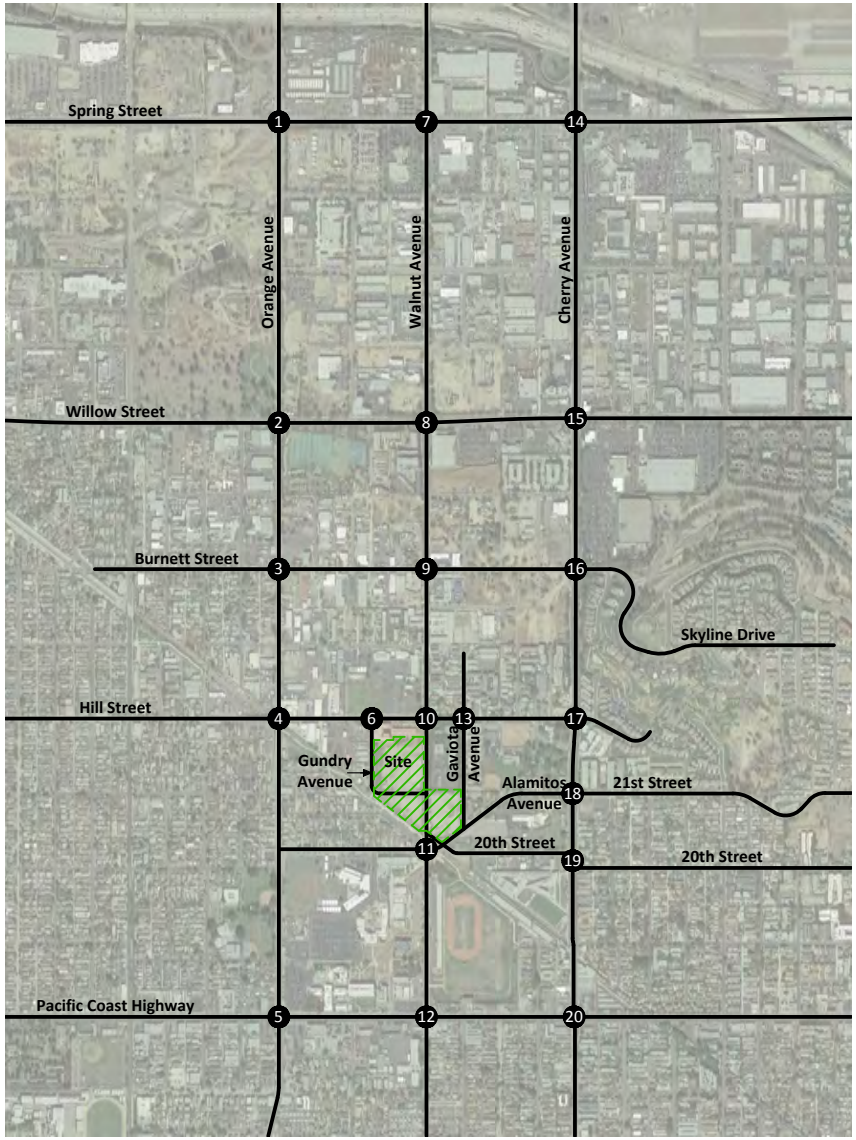
General Plan Buildout (Year 2040) Significant Impact Evaluation

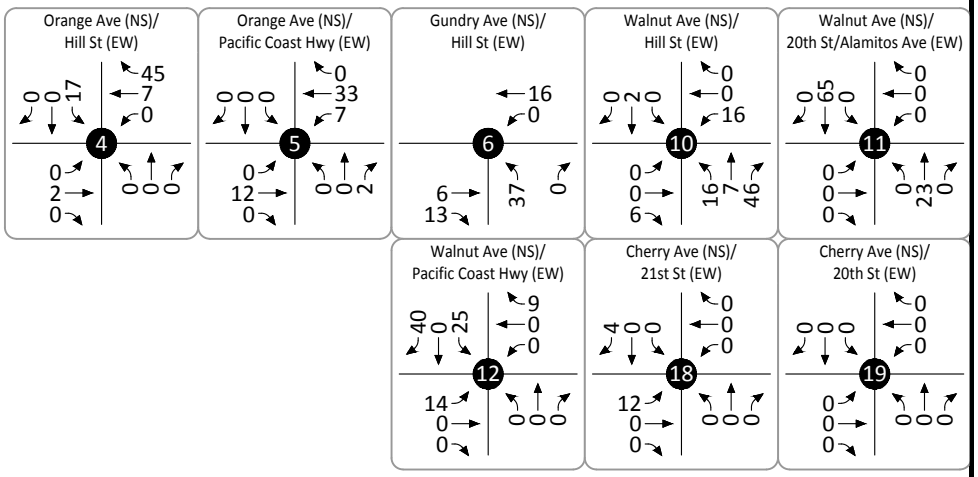
Signalized Intersections				
	School PM Peak Hour V/C [Delay]-LOS[1]			
Intersection	Without Project	With Project	Change in V/C or Delay	Significant Impact?
Orange Avenue (NS) at:				
Hill Street (EW) - #4	0.802-D	0.813-D	+0.011	No
Pacific Coast Highway (EW) - #5	[24.0]-C	[24.2]-C	+0.2	No
Walnut Avenue (NS) at:				
20th Street/Alamitos Avenue (EW) - #11	0.648-B	0.663-B	+0.015	No
Pacific Coast Highway (EW) - #12	[12.7]-B	[15.2]-B	+2.5	No
Cherry Avenue (NS) at:				
21st Street (EW) - #18	0.655-B	0.662-B	+0.007	No
20th Street (EW) - #19	0.564-A	0.564-A	0.000	No

Unsignalized Intersections					
	School PM Peak Hour Delay-LOS				
Intersection	Without Project	With Project	Acceptable LOS?	Traffic Signal Warranted?	Significant Impact?
Gundry Avenue (NS) at:					
Hill Street (EW) - #6	15.6-C	18.3-C	Yes	-	No
Walnut Avenue (NS) at:					
Hill Street (EW) - #10	29.1-D	48.6-E	No	No	No

[1] V/C = Volume/Capacity; Delay shown in [seconds/vehicle]; LOS = Level of Service; see Tables 8 and 9.

Figure 1
Project
Afternoon School Peak Hour Intersection Turning Movement Volumes





Legend

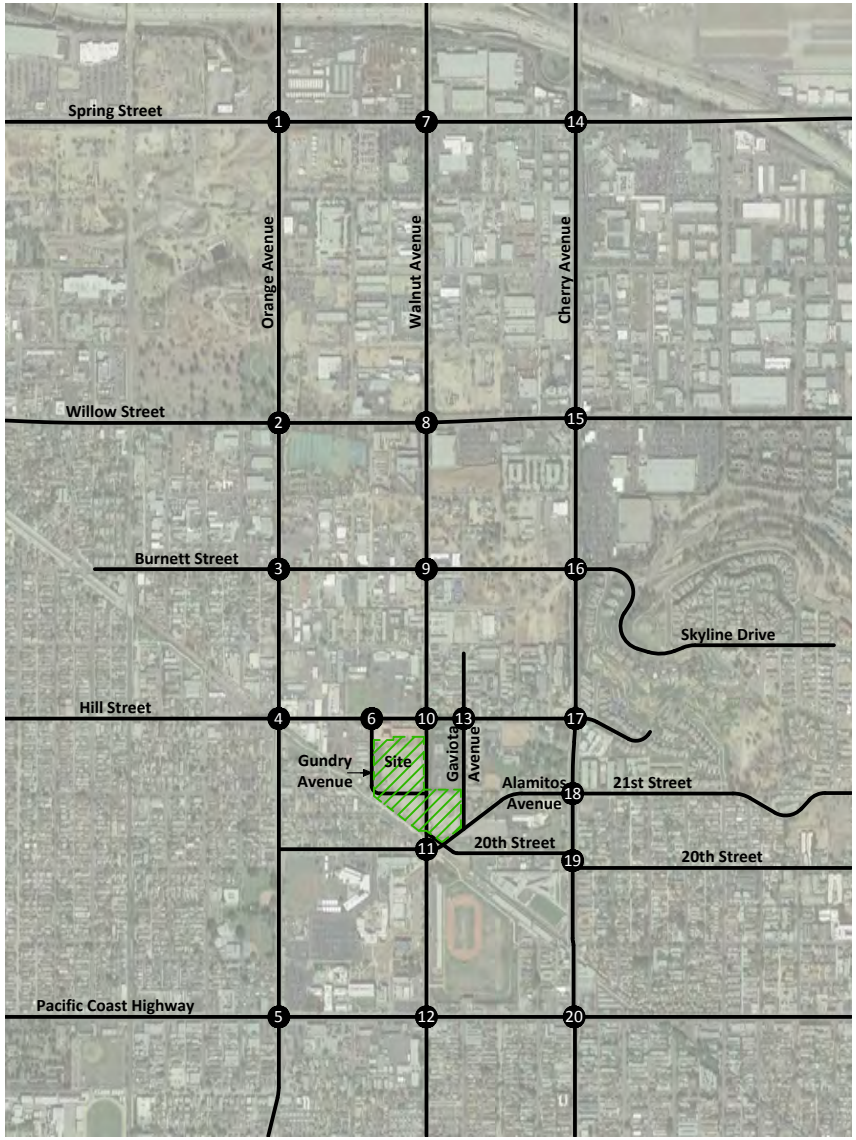
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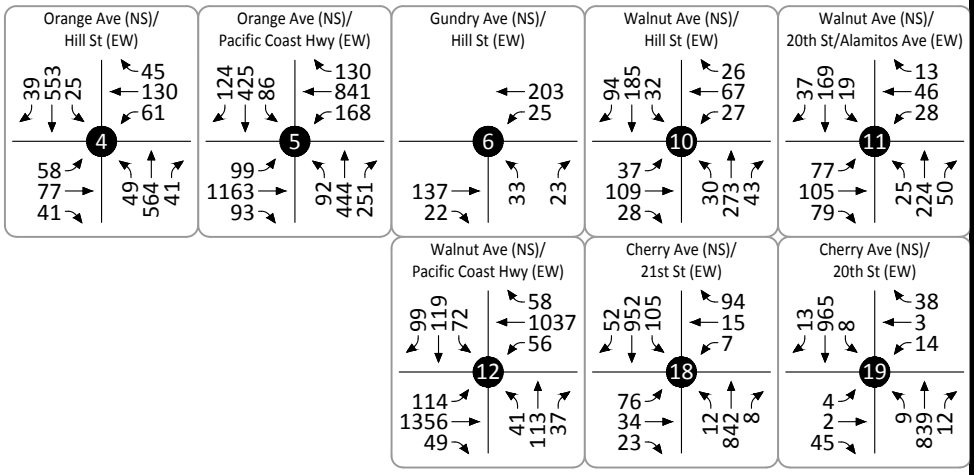
KUNZMAN ASSOCIATES, INC.

OVER 40 YEARS OF EXCELLENT SERVICE

JN 7311

Figure 2
Existing
Afternoon School Peak Hour Intersection Turning Movement Volumes

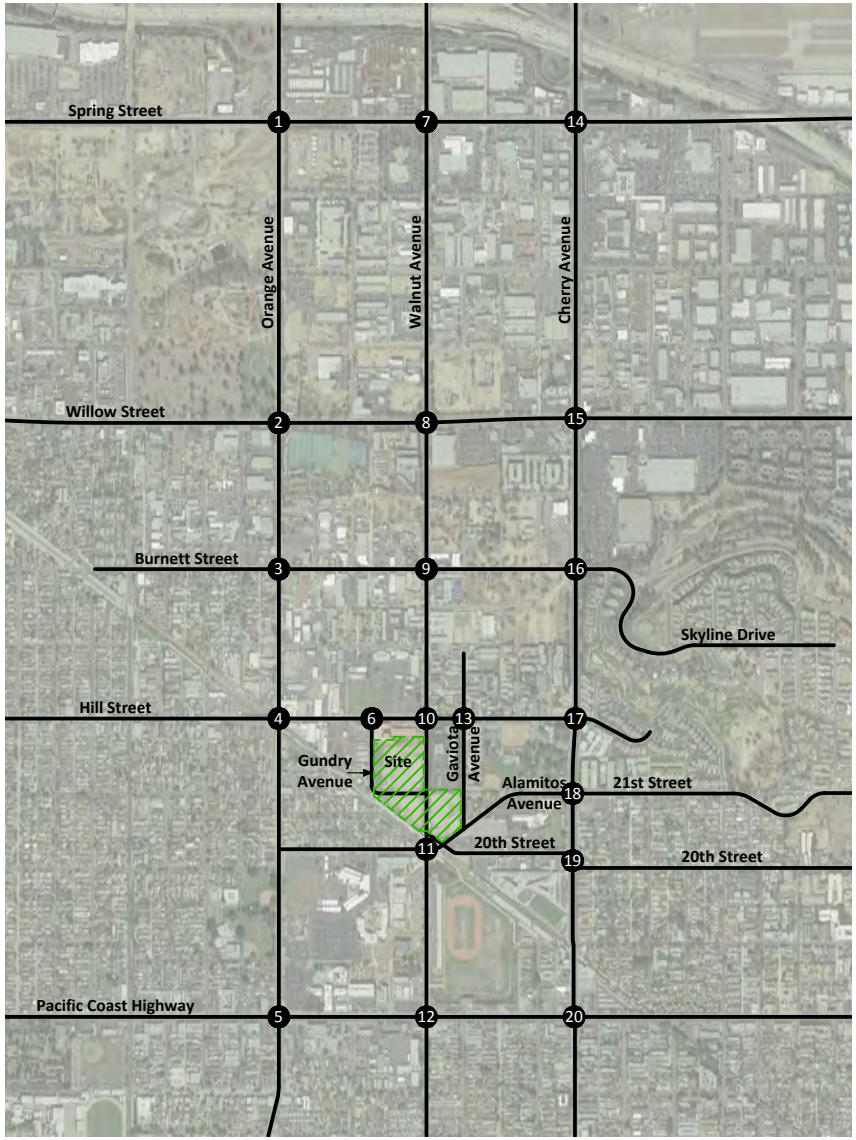


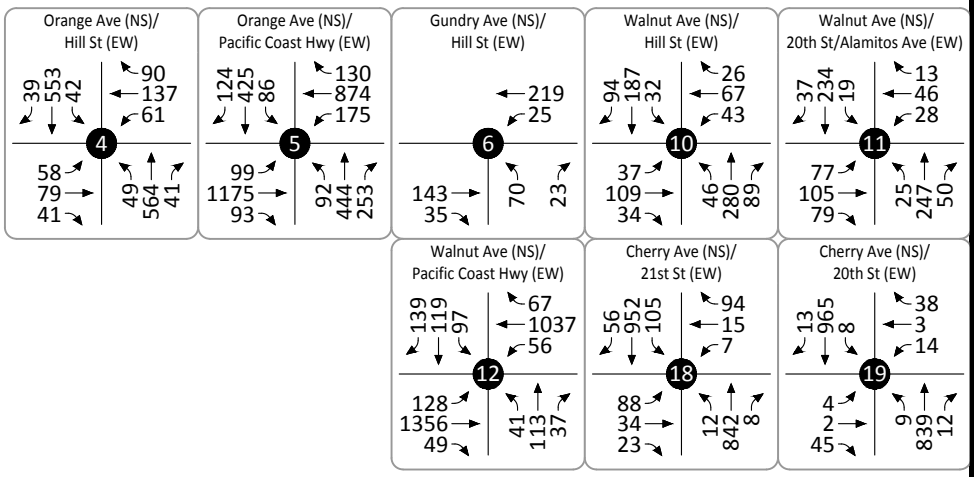


Legend

1 = Intersection Reference Number

Figure 3
Existing Plus Project
Afternoon School Peak Hour Intersection Turning Movement Volumes





Legend

1 = Intersection Reference Number

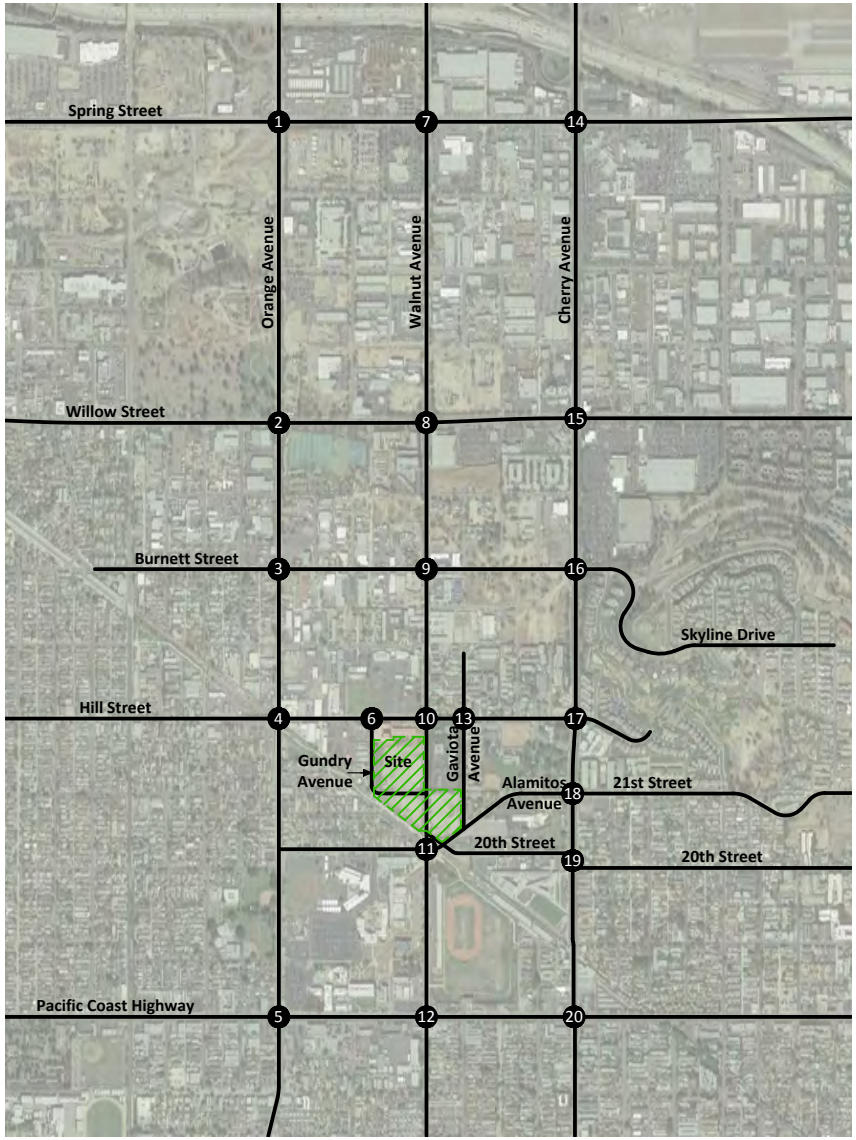
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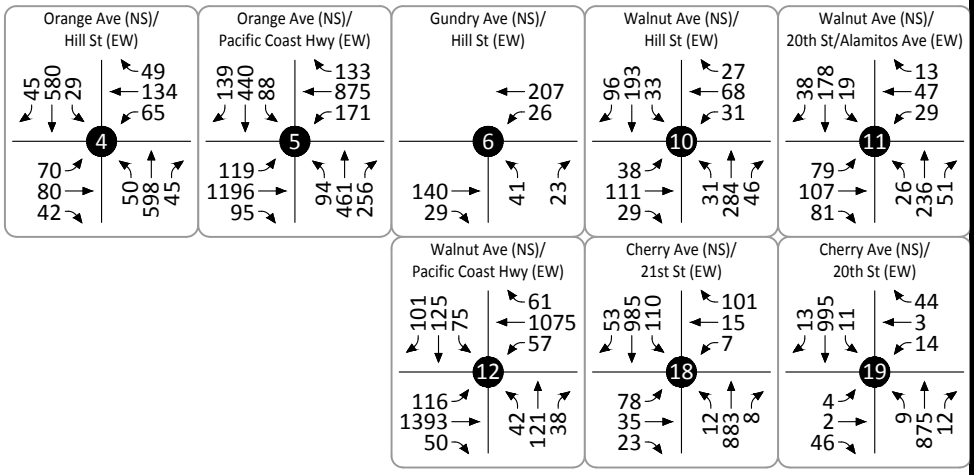
KUNZMAN ASSOCIATES, INC.

OVER 40 YEARS OF EXCELLENT SERVICE

JN 7311

Figure 4
Opening Year (2020) Without Project
Afternoon School Peak Hour Intersection Turning Movement Volumes





Legend

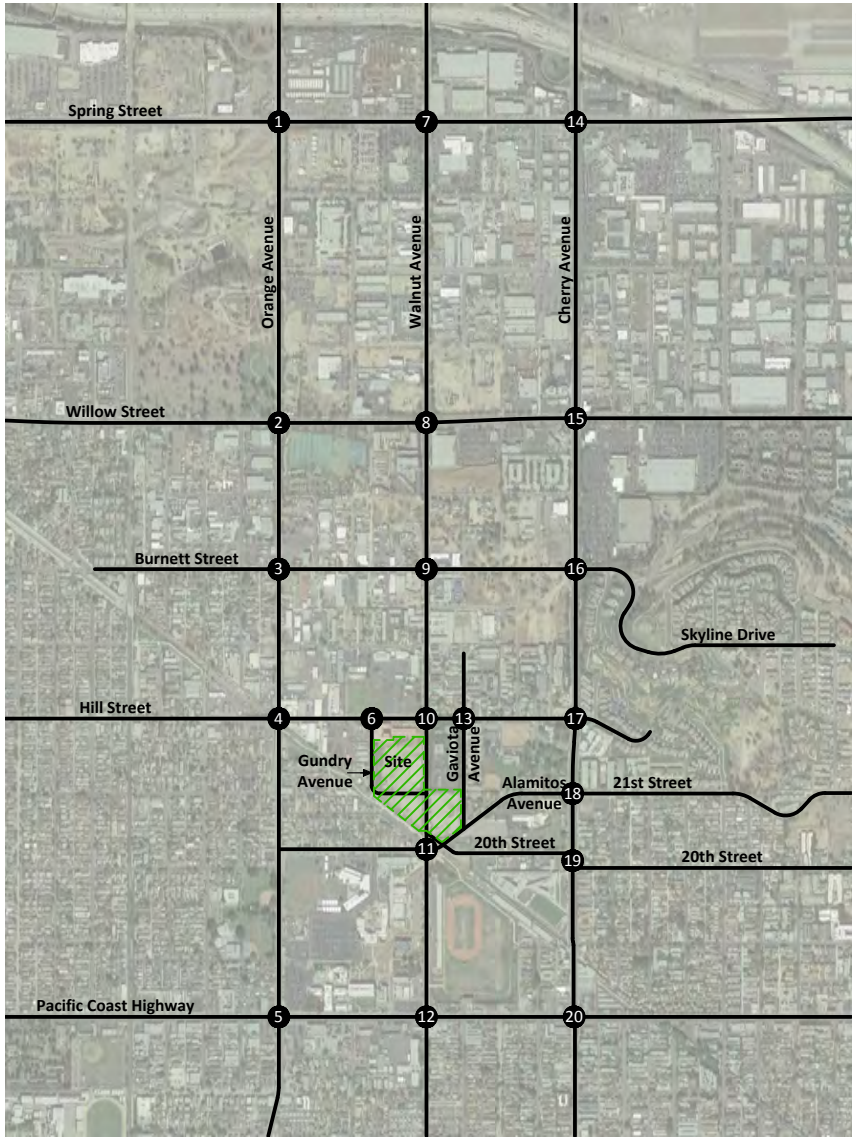
1 = Intersection Reference Number

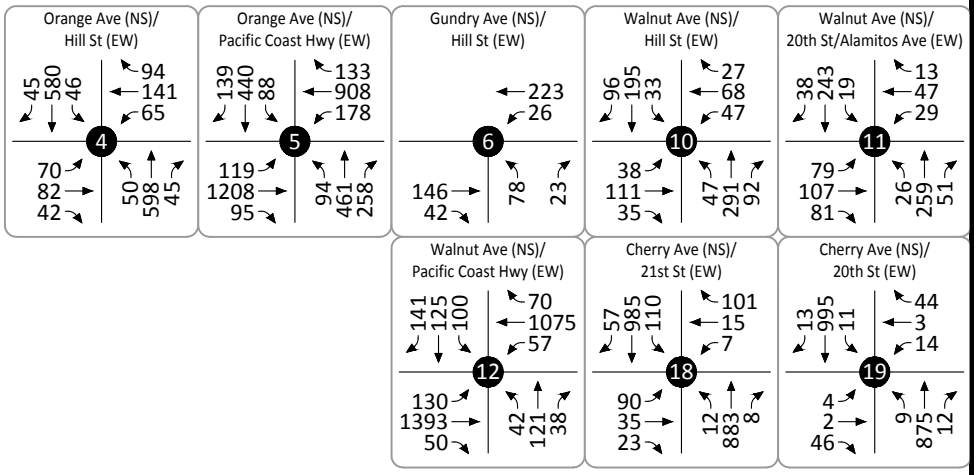
KUNZMAN ASSOCIATES, INC.

OVER 40 YEARS OF EXCELLENT SERVICE

JN 7311

Figure 5
Opening Year (2020) With Project
Afternoon School Peak Hour Intersection Turning Movement Volumes





Legend

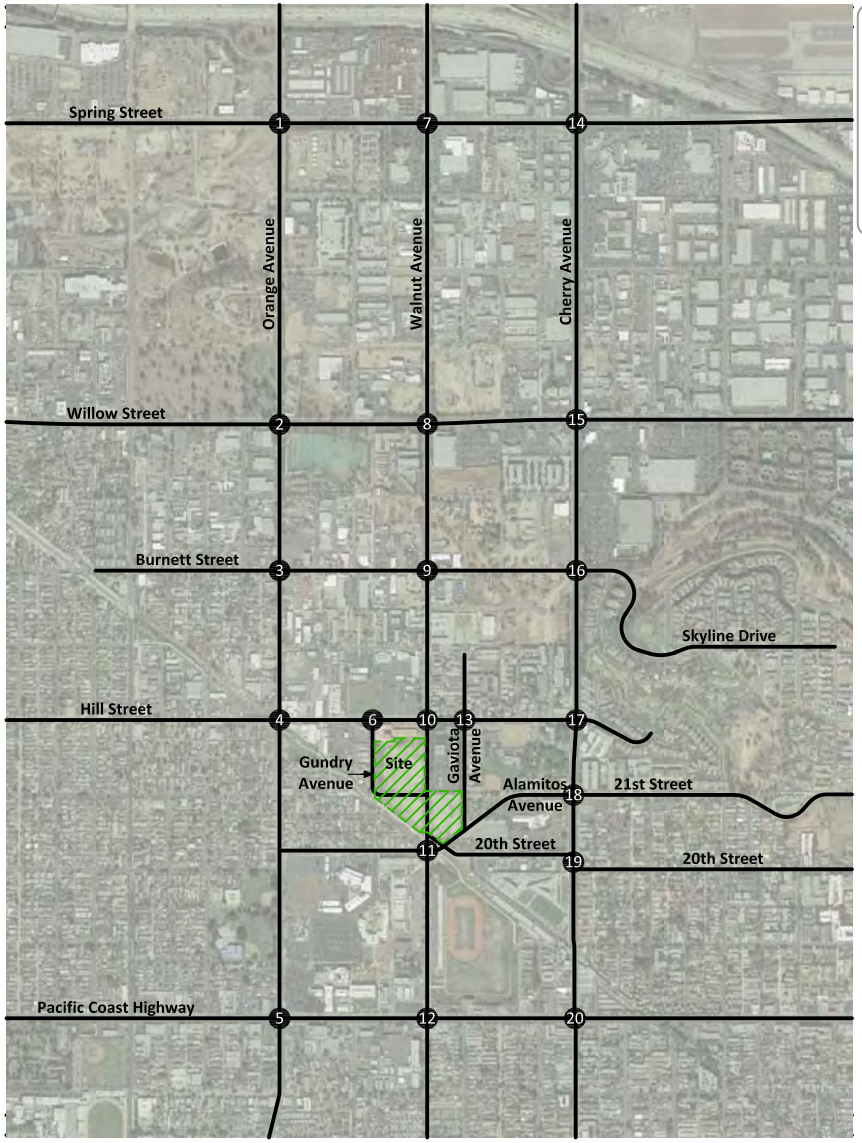
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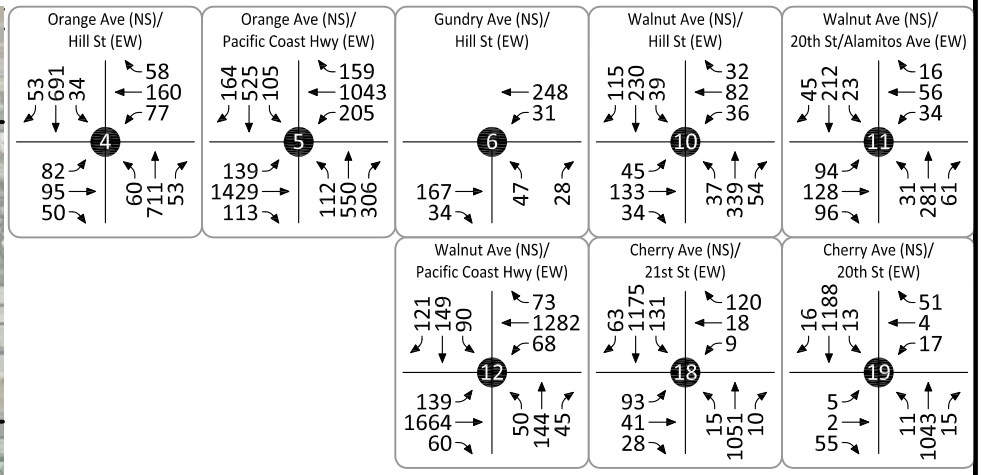
KUNZMAN ASSOCIATES, INC.

OVER 40 YEARS OF EXCELLENT SERVICE

JN 7311

Figure 6
General Plan Buildout (Year 2040) Without Project
Afternoon School Peak Hour Intersection Turning Movement Volumes





Legend

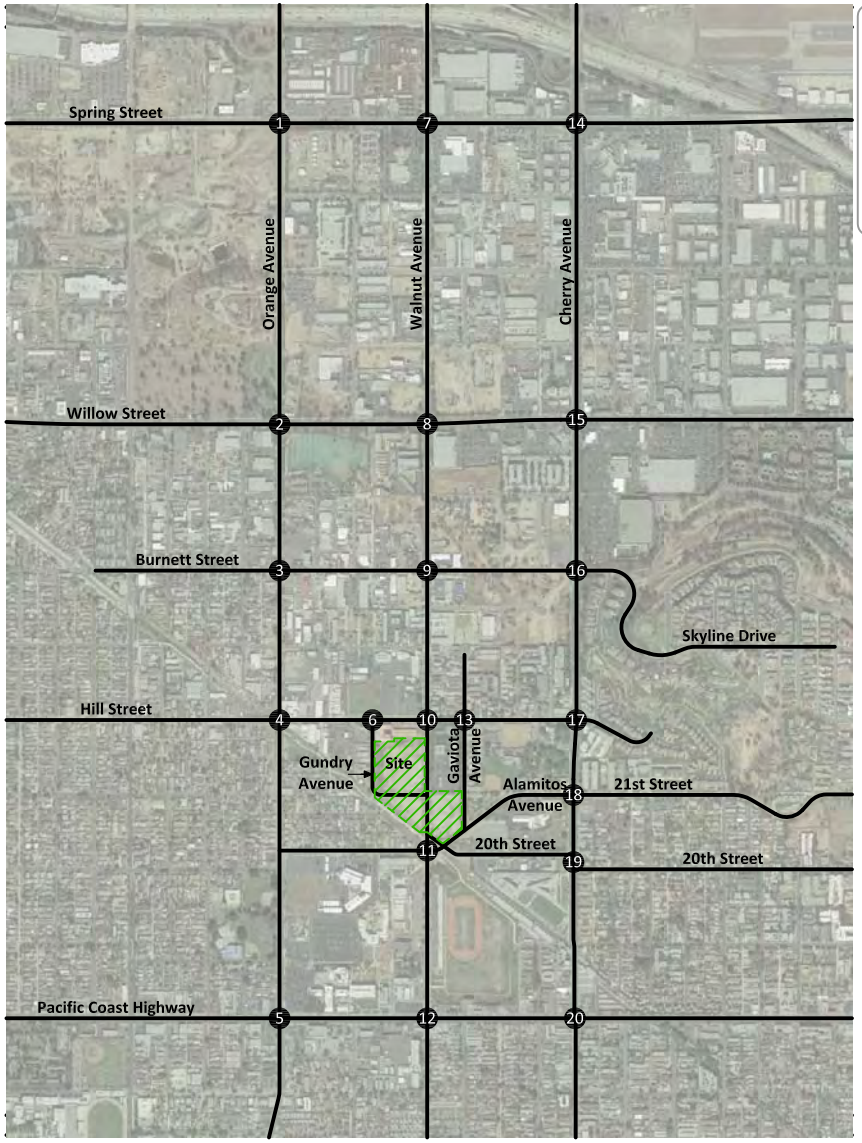
1 = Intersection Reference Number

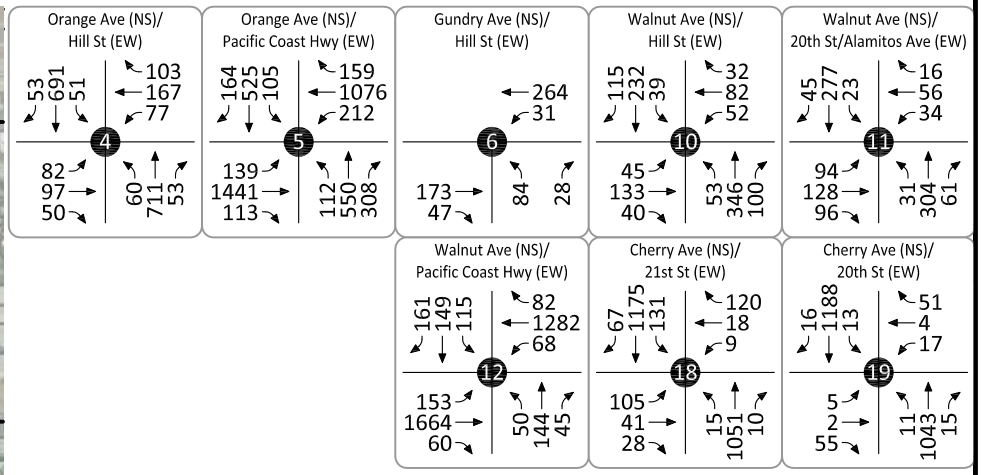
KUNZMAN ASSOCIATES, INC.

OVER 40 YEARS OF EXCELLENT SERVICE

JN 7311

Figure 7
General Plan Buildout (Year 2040) With Project
Afternoon School Peak Hour Intersection Turning Movement Volumes





Legend

1 = Intersection Reference Number

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OVER 40 YEARS OF EXCELLENT SERVICE

JN 7311

APPENDIX A

Glossary of Transportation Terms

GLOSSARY OF TRANSPORTATION TERMS

COMMON ABBREVIATIONS

AC:	Acres
ADT:	Average Daily Traffic
Caltrans:	California Department of Transportation
DU:	Dwelling Unit
ICU:	Intersection Capacity Utilization
LOS:	Level of Service
TSF:	Thousand Square Feet
V/C:	Volume/Capacity
VMT:	Vehicle Miles Traveled

TERMS

AVERAGE DAILY TRAFFIC: The total volume during a year divided by the number of days in a year. Usually only weekdays are included.

BANDWIDTH: The number of seconds of green time available for through traffic in a signal progression.

BOTTLENECK: A constriction along a travelway that limits the amount of traffic that can proceed downstream from its location.

CAPACITY: The maximum number of vehicles that can be reasonably expected to pass over a given section of a lane or a roadway in a given time period.

CHANNELIZATION: The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movements of both vehicles and pedestrians.

CLEARANCE INTERVAL: Nearly same as yellow time. If there is an all red interval after the end of a yellow, then that is also added into the clearance interval.

CORDON: An imaginary line around an area across which vehicles, persons, or other items are counted (in and out).

CYCLE LENGTH: The time period in seconds required for one complete signal cycle.

CUL-DE-SAC STREET: A local street open at one end only, and with special provisions for turning around.

DAILY CAPACITY: The daily volume of traffic that will result in a volume during the peak hour equal to the capacity of the roadway.

DELAY: The time consumed while traffic is impeded in its movement by some element over which it has no control, usually expressed in seconds per vehicle.

DEMAND RESPONSIVE SIGNAL: Same as traffic-actuated signal.

DENSITY: The number of vehicles occupying in a unit length of the through traffic lanes of a roadway at any given instant. Usually expressed in vehicles per mile.

DETECTOR: A device that responds to a physical stimulus and transmits a resulting impulse to the signal controller.

DESIGN SPEED: A speed selected for purposes of design. Features of a highway, such as curvature, superelevation, and sight distance (upon which the safe operation of vehicles is dependent) are correlated to design speed.

DIRECTIONAL SPLIT: The percent of traffic in the peak direction at any point in time.

DIVERSION: The rerouting of peak hour traffic to avoid congestion.

FORCED FLOW: Opposite of free flow.

FREE FLOW: Volumes are well below capacity. Vehicles can maneuver freely and travel is unimpeded by other traffic.

GAP: Time or distance between successive vehicles in a traffic stream, rear bumper to front bumper.

HEADWAY: Time or distance spacing between successive vehicles in a traffic stream, front bumper to front bumper.

INTERCONNECTED SIGNAL SYSTEM: A number of intersections that are connected to achieve signal progression.

LEVEL OF SERVICE: A qualitative measure of a number of factors, which include speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs.

LOOP DETECTOR: A vehicle detector consisting of a loop of wire embedded in the roadway, energized by alternating current and producing an output circuit closure when passed over by a vehicle.

MINIMUM ACCEPTABLE GAP: Smallest time headway between successive vehicles in a traffic stream into which another vehicle is willing and able to cross or merge.

MULTI-MODAL: More than one mode; such as automobile, bus transit, rail rapid transit, and bicycle transportation modes.

OFFSET: The time interval in seconds between the beginning of green at one intersection and the beginning of green at an adjacent intersection.

PLATOON: A closely grouped component of traffic that is composed of several vehicles moving, or standing ready to move, with clear spaces ahead and behind.

ORIGIN-DESTINATION SURVEY: A survey to determine the point of origin and the point of destination for a given vehicle trip.

PASSENGER CAR EQUIVALENTS (PCE): One car is one Passenger Car Equivalent. A truck is equal to 2 or 3 Passenger Car Equivalents in that a truck requires longer to start, goes slower, and accelerates slower. Loaded trucks have a higher Passenger Car Equivalent than empty trucks.

PEAK HOUR: The 60 consecutive minutes with the highest number of vehicles.

PRETIMED SIGNAL: A type of traffic signal that directs traffic to stop and go on a predetermined time schedule without regard to traffic conditions. Also, fixed time signal.

PROGRESSION: A term used to describe the progressive movement of traffic through several signalized intersections.

SCREEN-LINE: An imaginary line or physical feature across which all trips are counted, normally to verify the validity of mathematical traffic models.

SIGNAL CYCLE: The time period in seconds required for one complete sequence of signal indications.

SIGNAL PHASE: The part of the signal cycle allocated to one or more traffic movements.

STARTING DELAY: The delay experienced in initiating the movement of queued traffic from a stop to an average running speed through a signalized intersection.

TRAFFIC-ACTUATED SIGNAL: A type of traffic signal that directs traffic to stop and go in accordance with the demands of traffic, as registered by the actuation of detectors.

TRIP: The movement of a person or vehicle from one location (origin) to another (destination). For example, from home to store to home is two trips, not one.

TRIP-END: One end of a trip at either the origin or destination (i.e., each trip has two trip-ends). A trip-end occurs when a person, object, or message is transferred to or from a vehicle.

TRIP GENERATION RATE: The quantity of trips produced and/or attracted by a specific land use stated in terms of units such as per dwelling, per acre, and per 1,000 square feet of floor space.

TRUCK: A vehicle having dual tires on one or more axles, or having more than two axles.

UNBALANCED FLOW: Heavier traffic flow in one direction than the other. On a daily basis, most facilities have balanced flow. During the peak hours, flow is seldom balanced in an urban area.

VEHICLE MILES OF TRAVEL: A measure of the amount of usage of a section of highway, obtained by multiplying the average daily traffic by length of facility in miles.

APPENDIX B

Intersection Turning Movement Count Worksheets

INTERSECTION TURNING MOVEMENT COUNTS

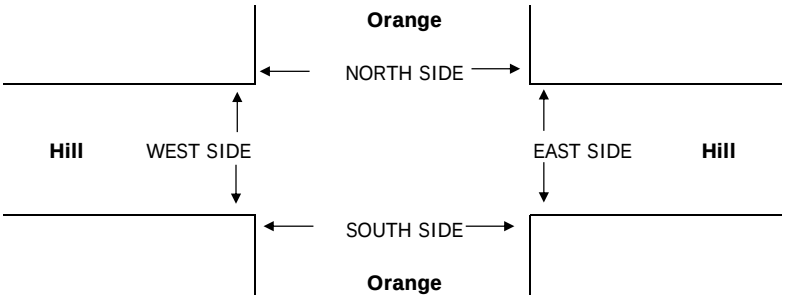
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1634
Wed, Feb 28, 18	NORTH & SOUTH:	Orange	LOCATION #:	4
	EAST & WEST:	Hill	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Orange			SOUTHBOUND Orange			EASTBOUND Hill			WESTBOUND Hill			
	LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 0	EL 0	ET 1	ER 1	WL 0	WT 1	WR 0	TOTAL
MIDDAY	1:30 PM	10	120	2	5	127	14	15	21	9	5	12	1	341
	1:45 PM	7	113	13	10	117	14	17	28	11	5	17	10	362
	2:00 PM	9	140	7	6	104	13	31	33	9	10	23	16	401
	2:15 PM	8	145	10	10	136	13	21	21	11	27	61	20	483
	2:30 PM	11	134	7	6	144	12	14	13	15	14	31	8	409
	2:45 PM	14	130	8	5	153	7	12	18	8	8	20	6	389
	3:00 PM	16	155	16	4	120	7	11	25	7	12	18	11	402
	3:15 PM	9	118	9	3	126	6	8	29	12	11	16	5	352
	VOLUMES	84	1,055	72	49	1,027	86	129	188	82	92	198	77	3,139
	APPROACH %	7%	87%	6%	4%	88%	7%	32%	47%	21%	25%	54%	21%	
	APP/DEPART	1,211	/	1,261	1,162	/	1,201	399	/	309	367	/	368	0
	BEGIN PEAK HR		2:15 PM											
	VOLUMES	49	564	41	25	553	39	58	77	41	61	130	45	1,683
	APPROACH %	7%	86%	6%	4%	90%	6%	33%	44%	23%	26%	55%	19%	
	PEAK HR FACTOR		0.874			0.935			0.830			0.546		0.871
	APP/DEPART	654	/	667	617	/	655	176	/	143	236	/	218	0



INTERSECTION TURNING MOVEMENT COUNTS

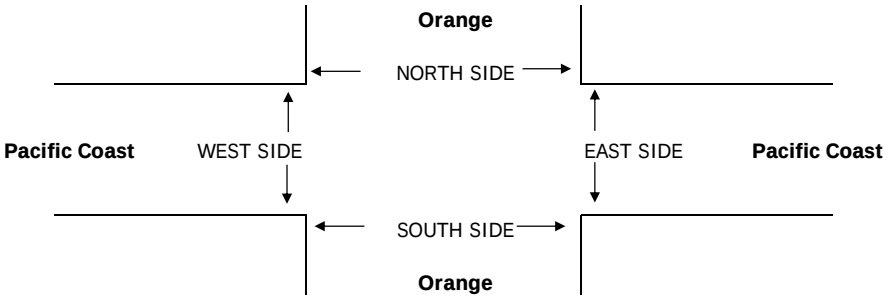
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1634
Wed, Feb 28, 18	NORTH & SOUTH:	Orange	LOCATION #:	5
	EAST & WEST:	Pacific Coast	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Orange			SOUTHBOUND Orange			EASTBOUND Pacific Coast			WESTBOUND Pacific Coast			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 3	ER 0	WL 1	WT 3	WR 0	TOTAL
MIDDAY	1:30 PM	19	97	35	19	93	22	20	219	25	41	159	29	778
	1:45 PM	18	102	40	20	104	31	18	210	33	36	178	26	816
	2:00 PM	26	89	55	24	81	33	28	209	22	36	192	33	828
	2:15 PM	24	99	48	25	103	32	21	259	24	46	246	20	947
	2:30 PM	28	113	62	21	92	38	21	251	20	36	210	30	922
	2:45 PM	16	98	64	17	114	31	32	322	29	54	216	32	1,025
	3:00 PM	26	117	62	25	113	32	23	305	24	35	195	34	991
	3:15 PM	22	116	63	23	106	23	23	285	20	43	220	34	978
	VOLUMES	179	831	429	174	806	242	186	2,060	197	327	1,616	238	7,285
	APPROACH %	12%	58%	30%	14%	66%	20%	8%	84%	8%	15%	74%	11%	
	APP/DEPART	1,439	/	1,255	1,222	/	1,330	2,443	/	2,663	2,181	/	2,037	0
	BEGIN PEAK HR		2:30 PM											
	VOLUMES	92	444	251	86	425	124	99	1,163	93	168	841	130	3,916
	APPROACH %	12%	56%	32%	14%	67%	20%	7%	86%	7%	15%	74%	11%	
	PEAK HR FACTOR		0.960			0.934			0.884			0.943		0.955
	APP/DEPART	787	/	673	635	/	686	1,355	/	1,500	1,139	/	1,057	0



INTERSECTION TURNING MOVEMENT COUNTS

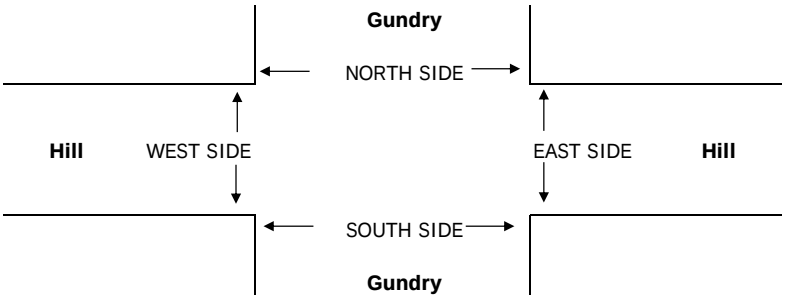
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:					
Wed, Feb 28, 18	LOCATION:	Signal Hill	PROJECT #:	SC1634
	NORTH & SOUTH:	Gundry	LOCATION #:	6
	EAST & WEST:	Hill	CONTROL:	STOP N

NOTES:

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

		NORTHBOUND Gundry			SOUTHBOUND Gundry			EASTBOUND Hill			WESTBOUND Hill			
	LANES:	NL 0	NT X	NR 0	SL X	ST X	SR X	EL X	ET 1	ER 0	WL 0	WT 1	WR X	TOTAL
MIDDAY	1:30 PM	2	0	1	0	0	0	0	34	1	5	17	0	60
	1:45 PM	3	0	3	0	0	0	1	40	5	5	34	0	91
	2:00 PM	10	0	7	0	0	0	1	35	6	10	50	0	119
	2:15 PM	10	0	3	0	0	0	0	36	6	6	89	0	150
	2:30 PM	10	0	10	0	0	0	0	26	5	4	30	0	85
	2:45 PM	5	0	2	0	0	0	1	28	3	1	24	0	64
	3:00 PM	2	0	1	0	0	0	0	46	1	5	22	0	77
	3:15 PM	3	0	3	0	0	0	1	39	5	5	29	0	85
	VOLUMES	45	0	30	0	0	0	4	284	32	41	295	0	731
	APPROACH %	60%	0%	40%	0%	0%	0%	1%	89%	10%	12%	88%	0%	
	APP/DEPART	75	/	0	0	/	67	320	/	320	336	/	344	0
	BEGIN PEAK HR		1:45 PM											
	VOLUMES	33	0	23	0	0	0	2	137	22	25	203	0	445
	APPROACH %	59%	0%	41%	0%	0%	0%	1%	85%	14%	11%	89%	0%	
	PEAK HR FACTOR		0.700			0.000			0.875			0.600		0.742
	APP/DEPART	56	/	0	0	/	44	161	/	163	228	/	238	0



INTERSECTION TURNING MOVEMENT COUNTS

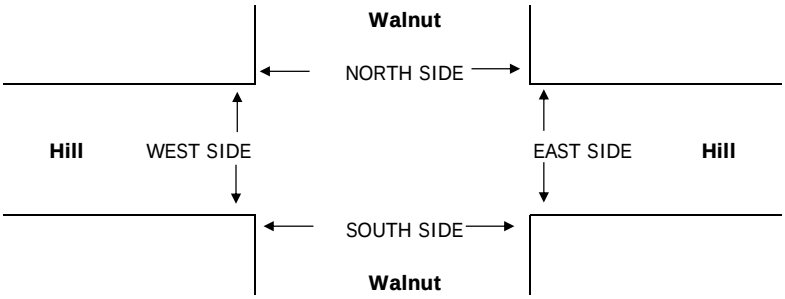
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1634
Wed, Feb 28, 18	NORTH & SOUTH:	Walnut	LOCATION #:	10
	EAST & WEST:	Hill	CONTROL:	STOP ALL

NOTES:

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

		NORTHBOUND Walnut			SOUTHBOUND Walnut			EASTBOUND Hill			WESTBOUND Hill			
	LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 1	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
MIDDAY	1:30 PM	5	36	6	5	34	8	9	13	2	8	15	4	145
	1:45 PM	5	34	5	9	57	18	11	27	8	6	16	8	204
	2:00 PM	7	41	4	13	34	20	11	24	8	6	24	4	196
	2:15 PM	9	46	3	17	54	57	7	29	13	15	24	7	281
	2:30 PM	5	64	15	7	39	17	9	24	7	6	14	4	211
	2:45 PM	8	75	13	6	47	3	4	23	4	2	14	8	207
	3:00 PM	8	88	12	2	45	17	17	33	4	4	15	7	252
	3:15 PM	5	63	3	3	59	12	11	21	7	3	16	3	206
	VOLUMES	52	447	61	62	369	152	79	194	53	50	138	45	1,702
	APPROACH %	9%	80%	11%	11%	63%	26%	24%	60%	16%	21%	59%	19%	
	APP/DEPART	560	/	570	583	/	473	326	/	317	233	/	342	0
	BEGIN PEAK HR		2:15 PM											
	VOLUMES	30	273	43	32	185	94	37	109	28	27	67	26	951
	APPROACH %	9%	79%	12%	10%	59%	30%	21%	63%	16%	23%	56%	22%	
	PEAK HR FACTOR		0.801			0.607			0.806			0.652		0.846
	APP/DEPART	346	/	336	311	/	240	174	/	184	120	/	191	0



INTERSECTION TURNING MOVEMENT COUNTS

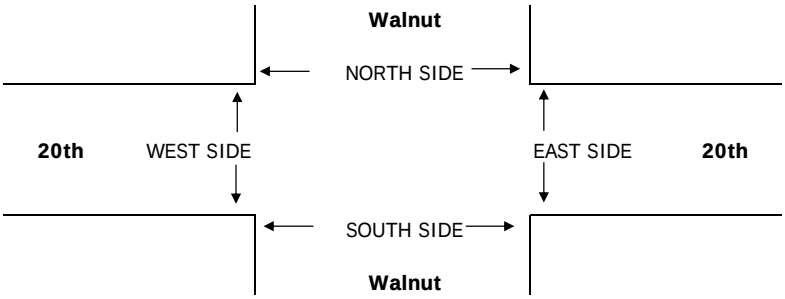
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1634
Wed, Feb 28, 18	NORTH & SOUTH:	Walnut	LOCATION #:	11
	EAST & WEST:	20th	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Walnut			SOUTHBOUND Walnut			EASTBOUND 20th			WESTBOUND 20th			
	LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
MIDDAY	1:30 PM	3	34	7	2	27	9	13	17	6	12	4	6	140
	1:45 PM	6	39	7	7	48	9	0	13	11	12	9	4	165
	2:00 PM	6	37	22	3	31	6	11	21	14	12	11	8	182
	2:15 PM	6	42	14	7	57	14	5	19	9	12	19	6	210
	2:30 PM	9	51	9	3	38	11	12	17	11	6	19	6	192
	2:45 PM	6	45	5	6	39	8	32	33	34	5	11	1	225
	3:00 PM	6	76	19	0	42	7	20	29	17	5	7	3	231
	3:15 PM	4	52	17	10	50	11	13	26	17	12	9	3	224
	VOLUMES	46	376	100	38	332	75	106	175	119	76	89	37	1,569
	APPROACH %	9%	72%	19%	9%	75%	17%	27%	44%	30%	38%	44%	18%	
	APP/DEPART	522	/	519	445	/	527	400	/	313	202	/	210	0
	BEGIN PEAK HR		2:30 PM											
	VOLUMES	25	224	50	19	169	37	77	105	79	28	46	13	872
	APPROACH %	8%	75%	17%	8%	75%	16%	30%	40%	30%	32%	53%	15%	
	PEAK HR FACTOR		0.740			0.792			0.659			0.702		0.944
	APP/DEPART	299	/	314	225	/	276	261	/	174	87	/	108	0



INTERSECTION TURNING MOVEMENT COUNTS

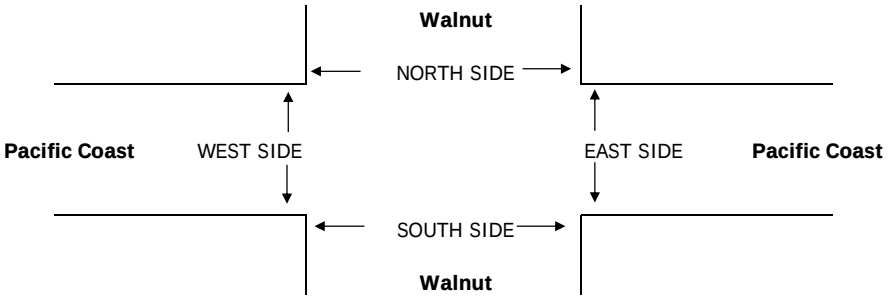
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1634
Wed, Feb 28, 18	NORTH & SOUTH:	Walnut	LOCATION #:	12
	EAST & WEST:	Pacific Coast	CONTROL:	SIGNAL

NOTES:

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

	NORTHBOUND Walnut			SOUTHBOUND Walnut			EASTBOUND Pacific Coast			WESTBOUND Pacific Coast			
LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 1	ET 3	ER 0	WL 1	WT 3	WR 0	TOTAL
MIDDAY													
1:30 PM	10	16	18	13	20	10	15	263	19	9	180	40	613
1:45 PM	8	23	4	13	26	31	25	233	16	6	232	22	639
2:00 PM	12	18	10	18	23	17	29	240	14	8	230	17	636
2:15 PM	8	24	12	19	23	35	23	284	26	12	274	17	757
2:30 PM	13	21	9	12	28	15	29	307	16	11	248	15	724
2:45 PM	11	17	12	22	25	30	31	365	13	18	265	16	825
3:00 PM	9	39	9	16	28	29	21	352	12	11	239	14	779
3:15 PM	8	36	7	22	38	25	33	332	8	16	285	13	823
VOLUMES	79	194	81	135	211	192	206	2,376	124	91	1,953	154	5,796
APPROACH %	22%	55%	23%	25%	39%	36%	8%	88%	5%	4%	89%	7%	
APP/DEPART	354	/	554	538	/	426	2,706	/	2,592	2,198	/	2,224	0
BEGIN PEAK HR		2:30 PM											
VOLUMES	41	113	37	72	119	99	114	1,356	49	56	1,037	58	3,151
APPROACH %	21%	59%	19%	25%	41%	34%	8%	89%	3%	5%	90%	5%	
PEAK HR FACTOR		0.838			0.853			0.928			0.916		0.955
APP/DEPART	191	/	285	290	/	224	1,519	/	1,465	1,151	/	1,177	0



INTERSECTION TURNING MOVEMENT COUNTS

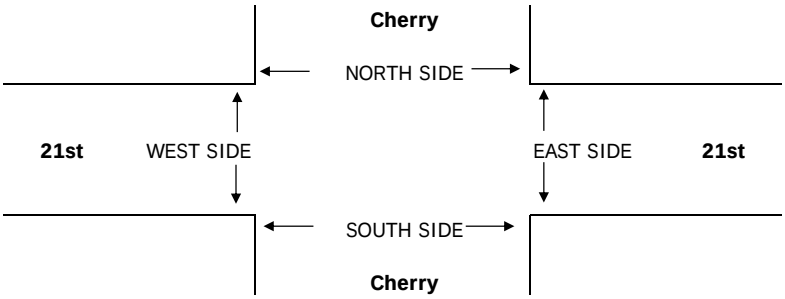
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1634
Wed, Feb 28, 18	NORTH & SOUTH:	Cherry	LOCATION #:	18
	EAST & WEST:	21st	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Cherry			SOUTHBOUND Cherry			EASTBOUND 21st			WESTBOUND 21st			
	LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 0	ET 1	ER 0	WL 1	WT 1	WR 0	TOTAL
MIDDAY	1:30 PM	11	197	2	14	213	14	11	3	2	3	6	25	501
	1:45 PM	7	216	1	27	239	19	10	4	3	1	4	21	552
	2:00 PM	4	200	0	21	208	8	17	12	10	6	8	18	512
	2:15 PM	1	196	1	30	249	13	21	12	6	1	3	21	554
	2:30 PM	4	225	2	22	239	20	15	5	7	2	5	19	565
	2:45 PM	4	204	3	24	251	9	20	8	6	1	4	23	557
	3:00 PM	3	217	2	29	213	10	20	9	4	3	3	31	544
	3:15 PM	3	203	1	26	223	11	17	10	6	1	2	21	524
	VOLUMES	37	1,658	12	193	1,835	104	131	63	44	18	35	179	4,309
	APPROACH %	2%	97%	1%	9%	86%	5%	55%	26%	18%	8%	15%	77%	
	APP/DEPART	1,707	/	1,980	2,132	/	1,900	238	/	256	232	/	173	0
	BEGIN PEAK HR		2:15 PM											
	VOLUMES	12	842	8	105	952	52	76	34	23	7	15	94	2,220
	APPROACH %	1%	98%	1%	9%	86%	5%	57%	26%	17%	6%	13%	81%	
	PEAK HR FACTOR		0.933			0.949			0.853			0.784		0.982
	APP/DEPART	862	/	1,017	1,109	/	985	133	/	142	116	/	76	0



INTERSECTION TURNING MOVEMENT COUNTS

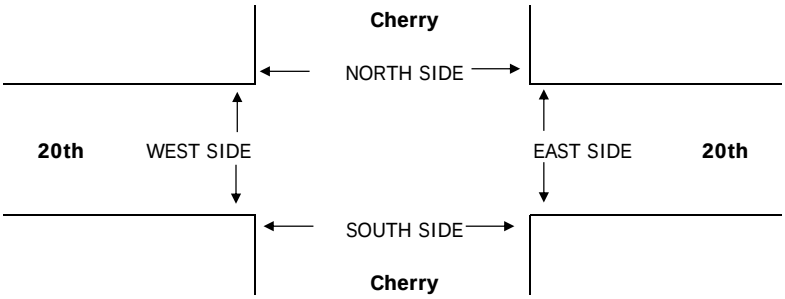
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Signal Hill	PROJECT #:	SC1634
Wed, Feb 28, 18	NORTH & SOUTH:	Cherry	LOCATION #:	19
	EAST & WEST:	20th	CONTROL:	SIGNAL

NOTES:

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

		NORTHBOUND Cherry			SOUTHBOUND Cherry			EASTBOUND 20th			WESTBOUND 20th			
	LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 1	ET 0	ER 1	WL 0	WT 1	WR 0	TOTAL
MIDDAY	1:30 PM	3	202	2	2	210	7	4	0	6	2	0	6	444
	1:45 PM	4	205	2	0	226	3	4	0	3	1	3	12	463
	2:00 PM	2	195	2	2	219	6	5	4	12	2	7	5	461
	2:15 PM	5	189	3	2	214	10	7	7	21	3	2	3	466
	2:30 PM	2	227	4	2	266	4	1	1	9	4	0	9	529
	2:45 PM	1	190	2	3	255	1	2	1	14	5	1	8	483
	3:00 PM	2	202	4	0	202	2	0	0	10	3	0	14	439
	3:15 PM	4	220	2	3	242	6	1	0	12	2	2	7	501
	VOLUMES	23	1,630	21	14	1,834	39	24	13	87	22	15	64	3,786
	APPROACH %	1%	97%	1%	1%	97%	2%	19%	10%	70%	22%	15%	63%	
	APP/DEPART	1,674	/	1,718	1,887	/	1,944	124	/	47	101	/	77	0
	BEGIN PEAK HR		2:30 PM											
	VOLUMES	9	839	12	8	965	13	4	2	45	14	3	38	1,952
	APPROACH %	1%	98%	1%	1%	98%	1%	8%	4%	88%	25%	5%	69%	
	PEAK HR FACTOR		0.923			0.906			0.750			0.809		0.922
	APP/DEPART	860	/	881	986	/	1,024	51	/	22	55	/	25	0



APPENDIX C

Intersection Capacity Utilization/Delay and Level of Service Worksheets

Existing

Signal Hill Business Park

Vistro File: Z:\...\School PM.vistro
Report File: Z:\...\School PM - E.pdf

Scenario 1 Existing
3/6/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Right	0.656	-	B
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.559	20.4	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.090	13.2	B
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.650	14.8	B
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	NB Thru	0.564	-	A
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	SB Thru	0.505	9.9	A
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	SB Thru	0.544	-	A
19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	SB Thru	0.475	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.656

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	141	10	6	138	10	15	19	10	15	33	11
Total Analysis Volume [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.38	0.38	0.02	0.37	0.37	0.04	0.08	0.03	0.04	0.12	0.03
Intersection LOS	B											
Intersection V/C	0.656											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	20.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.559

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	92	444	251	86	425	124	99	1163	93	168	841	130
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	92	444	251	86	425	124	99	1163	93	168	841	130
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	116	66	23	111	32	26	304	24	44	220	34
Total Analysis Volume [veh/h]	96	465	263	90	445	130	104	1218	97	176	881	136
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	11	33	0	16	38	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	37	21	21	21	6	36	36	11	40	40
g / C, Green / Cycle	0.27	0.27	0.46	0.27	0.27	0.27	0.08	0.44	0.44	0.14	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.10	0.13	0.16	0.10	0.12	0.08	0.06	0.24	0.24	0.10	0.19	0.19
s, saturation flow rate [veh/h]	960	3618	1615	942	3618	1615	1810	3618	1829	1810	3618	1773
c, Capacity [veh/h]	222	969	737	215	969	433	145	1605	812	251	1818	891
d1, Uniform Delay [s]	33.05	24.63	14.14	33.29	24.48	23.35	35.96	16.33	16.33	32.91	12.22	12.22
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.32	0.37	0.29	1.30	0.34	0.39	6.54	1.33	2.61	3.55	0.59	1.21
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.43	0.48	0.36	0.42	0.46	0.30	0.72	0.54	0.54	0.70	0.38	0.38
d, Delay for Lane Group [s/veh]	34.37	25.00	14.43	34.59	24.82	23.73	42.51	17.66	18.95	36.47	12.81	13.44
Lane Group LOS	C	C	B	C	C	C	D	B	B	D	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	1.79	3.56	2.88	1.71	3.44	1.94	2.18	5.63	5.98	3.38	3.49	3.59
50th-Percentile Queue Length [ft]	44.81	88.98	72.01	42.69	86.02	48.46	54.46	140.63	149.45	84.46	87.33	89.66
95th-Percentile Queue Length [veh]	3.23	6.41	5.18	3.07	6.19	3.49	3.92	9.52	9.99	6.08	6.29	6.46
95th-Percentile Queue Length [ft]	80.66	160.17	129.62	76.85	154.84	87.22	98.02	237.88	249.70	152.02	157.20	161.38

Movement, Approach, & Intersection Results

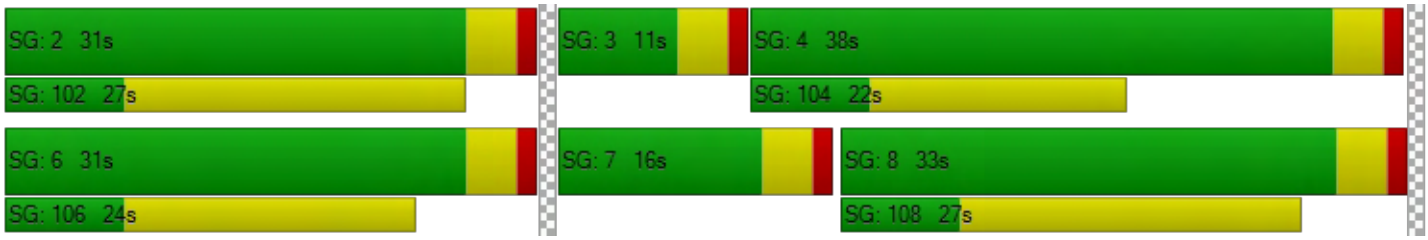
d_M, Delay for Movement [s/veh]	34.37	25.00	14.43	34.59	24.82	23.73	42.51	18.03	18.95	36.47	12.95	13.44
Movement LOS	C	C	B	C	C	C	D	B	B	D	B	B
d_A, Approach Delay [s/veh]	22.72			25.93			19.88			16.48		
Approach LOS	C			C			B			B		
d_I, Intersection Delay [s/veh]	20.44											
Intersection LOS	C											
Intersection V/C	0.559											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.739	2.669	3.134	3.164
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	675	675	725	850
d_b, Bicycle Delay [s]	17.56	17.56	16.26	13.23
l_b,int, Bicycle LOS Score for Intersection	2.239	2.108	2.340	2.216
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	13.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.090

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	33	23	137	22	25	203
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	23	137	22	25	203
Peak Hour Factor	0.7420	0.7420	0.7420	0.7420	0.7420	0.7420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	8	46	7	8	68
Total Analysis Volume [veh/h]	44	31	185	30	34	274
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.04	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	13.22	10.13	0.00	0.00	7.70	0.00
Movement LOS	B	B	A	A	A	A
95th-Percentile Queue Length [veh]	0.43	0.43	0.00	0.00	0.87	0.87
95th-Percentile Queue Length [ft]	10.78	10.78	0.00	0.00	21.67	21.67
d_A, Approach Delay [s/veh]	11.94		0.00		0.85	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	1.94					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	14.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.650

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	30	273	43	32	185	94	37	109	28	27	67	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	273	43	32	185	94	37	109	28	27	67	26
Peak Hour Factor	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	81	13	9	55	28	11	32	8	8	20	8
Total Analysis Volume [veh/h]	35	323	51	38	219	111	44	129	33	32	79	31
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	629	566	646	570	557
Degree of Utilization, x	0.65	0.45	0.17	0.36	0.26

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.75	2.35	0.62	1.64	1.01
95th-Percentile Queue Length [ft]	118.80	58.83	15.43	40.99	25.20
Approach Delay [s/veh]	18.71	12.79		12.85	11.67
Approach LOS	C	B		B	B
Intersection Delay [s/veh]	14.82				
Intersection LOS	B				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.564

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	25	224	50	19	169	37	77	105	79	28	46	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	224	50	19	169	37	77	105	79	28	46	13
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	56	13	5	42	9	19	26	20	7	12	3
Total Analysis Volume [veh/h]	25	224	50	19	169	37	77	105	79	28	46	13
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.17	0.17	0.01	0.13	0.13	0.05	0.16	0.16	0.02	0.05	0.05
Intersection LOS	A											
Intersection V/C	0.564											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	9.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.505

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	41	113	37	72	119	99	114	1356	49	56	1037	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	41	113	37	72	119	99	114	1356	49	56	1037	58
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	30	10	19	31	26	30	355	13	15	271	15
Total Analysis Volume [veh/h]	43	118	39	75	125	104	119	1420	51	59	1086	61
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	37.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	32	0	0	32	0	0	48	0	0	48	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	55	55	55	55	55	55
g / C, Green / Cycle	0.21	0.21	0.69	0.69	0.69	0.69	0.69	0.69
(v / s)_i Volume / Saturation Flow Rate	0.13	0.19	0.24	0.27	0.27	0.16	0.21	0.21
s, saturation flow rate [veh/h]	1593	1630	498	3618	1866	366	3618	1849
c, Capacity [veh/h]	389	398	380	2496	1288	291	2496	1276
d1, Uniform Delay [s]	28.09	30.52	9.18	5.25	5.25	9.62	4.86	4.86
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.05	3.06	2.15	0.46	0.89	1.56	0.31	0.62
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.51	0.76	0.31	0.39	0.39	0.20	0.30	0.30
d, Delay for Lane Group [s/veh]	29.15	33.58	11.32	5.70	6.13	11.18	5.17	5.48
Lane Group LOS	C	C	B	A	A	B	A	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh]	3.42	5.80	1.23	2.83	3.07	0.63	2.04	2.19
50th-Percentile Queue Length [ft]	85.48	145.06	30.77	70.65	76.74	15.67	51.02	54.86
95th-Percentile Queue Length [veh]	6.15	9.75	2.22	5.09	5.53	1.13	3.67	3.95
95th-Percentile Queue Length [ft]	153.87	243.82	55.39	127.16	138.14	28.21	91.83	98.76

Movement, Approach, & Intersection Results

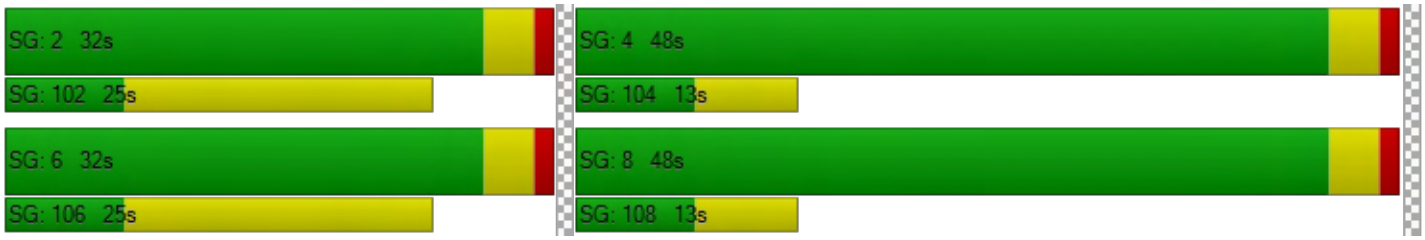
d_M, Delay for Movement [s/veh]	29.15	29.15	29.15	33.58	33.58	33.58	11.32	5.84	6.13	11.18	5.26	5.48
Movement LOS	C	C	C	C	C	C	B	A	A	B	A	A
d_A, Approach Delay [s/veh]	29.15			33.58			6.26			5.56		
Approach LOS	C			C			A			A		
d_I, Intersection Delay [s/veh]	9.91											
Intersection LOS	A											
Intersection V/C	0.505											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.004	2.298	3.042	3.076
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	700	700	1100	1100
d_b, Bicycle Delay [s]	16.90	16.90	8.10	8.10
l_b,int, Bicycle LOS Score for Intersection	1.890	2.061	2.434	2.223
Bicycle LOS	A	B	B	B

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.544

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	12	842	8	105	952	52	76	34	23	7	15	94
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	842	8	105	952	52	76	34	23	7	15	94
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	211	2	26	238	13	19	9	6	2	4	24
Total Analysis Volume [veh/h]	12	842	8	105	952	52	76	34	23	7	15	94
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.26	0.01	0.07	0.30	0.03	0.05	0.07	0.01	0.00	0.07	0.07
Intersection LOS	A											
Intersection V/C	0.544											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.475

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	9	839	12	8	965	13	4	2	45	14	3	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	839	12	8	965	13	4	2	45	14	3	38
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	210	3	2	241	3	1	1	11	4	1	10
Total Analysis Volume [veh/h]	9	839	12	8	965	13	4	2	45	14	3	38
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.27	0.27	0.01	0.31	0.31	0.00	0.03	0.03	0.01	0.03	0.03
Intersection LOS	A											
Intersection V/C	0.475											

Existing Plus Project

Signal Hill Business Park

Vistro File: Z:\...\School PM.vistro
Report File: Z:\...\School PM - EP.pdf

Scenario 2 Existing Plus Project
3/6/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Right	0.664	-	B
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.567	20.5	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.202	14.9	B
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.803	19.6	C
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	NB Thru	0.578	-	A
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	SB Right	0.559	11.6	B
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	SB Thru	0.552	-	A
19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	SB Thru	0.475	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.664

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	17	0	0	0	2	0	0	7	45
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	564	41	42	553	39	58	79	41	61	137	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	141	10	11	138	10	15	20	10	15	34	23
Total Analysis Volume [veh/h]	49	564	41	42	553	39	58	79	41	61	137	90
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.38	0.38	0.03	0.37	0.37	0.04	0.09	0.03	0.04	0.12	0.06
Intersection LOS	B											
Intersection V/C	0.664											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	20.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.567

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	92	444	251	86	425	124	99	1163	93	168	841	130
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	2	0	0	0	0	12	0	7	33	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	92	444	253	86	425	124	99	1175	93	175	874	130
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	116	66	23	111	32	26	308	24	46	229	34
Total Analysis Volume [veh/h]	96	465	265	90	445	130	104	1230	97	183	915	136
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	11	33	0	16	38	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	37	21	21	21	6	35	35	11	40	40
g / C, Green / Cycle	0.27	0.27	0.46	0.27	0.27	0.27	0.08	0.44	0.44	0.14	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.10	0.13	0.16	0.10	0.12	0.08	0.06	0.24	0.24	0.10	0.19	0.20
s, saturation flow rate [veh/h]	960	3618	1615	942	3618	1615	1810	3618	1830	1810	3618	1777
c, Capacity [veh/h]	223	969	739	215	969	433	145	1601	810	253	1817	893
d1, Uniform Delay [s]	33.05	24.63	14.09	33.29	24.48	23.34	35.96	16.46	16.46	32.96	12.31	12.32
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.32	0.37	0.29	1.29	0.34	0.39	6.54	1.37	2.69	3.89	0.63	1.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.43	0.48	0.36	0.42	0.46	0.30	0.72	0.55	0.55	0.72	0.39	0.39
d, Delay for Lane Group [s/veh]	34.36	25.00	14.38	34.58	24.82	23.73	42.51	17.83	19.15	36.85	12.94	13.59
Lane Group LOS	C	C	B	C	C	C	D	B	B	D	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	1.79	3.56	2.90	1.71	3.44	1.94	2.18	5.71	6.08	3.54	3.64	3.74
50th-Percentile Queue Length [ft]	44.81	88.98	72.43	42.69	86.01	48.45	54.46	142.84	151.92	88.42	90.96	93.54
95th-Percentile Queue Length [veh]	3.23	6.41	5.22	3.07	6.19	3.49	3.92	9.63	10.12	6.37	6.55	6.73
95th-Percentile Queue Length [ft]	80.65	160.16	130.38	76.84	154.82	87.21	98.02	240.84	252.98	159.16	163.72	168.37

Movement, Approach, & Intersection Results

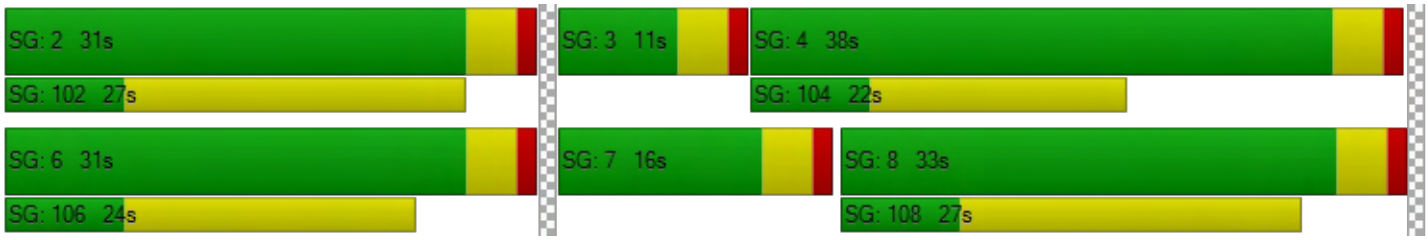
d_M, Delay for Movement [s/veh]	34.36	25.00	14.38	34.58	24.82	23.73	42.51	18.20	19.15	36.85	13.09	13.59
Movement LOS	C	C	B	C	C	C	D	B	B	D	B	B
d_A, Approach Delay [s/veh]	22.68			25.93			20.03			16.67		
Approach LOS	C			C			C			B		
d_I, Intersection Delay [s/veh]	20.50											
Intersection LOS	C											
Intersection V/C	0.567											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.740	2.669	3.142	3.173
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	675	675	725	850
d_b, Bicycle Delay [s]	17.56	17.56	16.26	13.23
l_b,int, Bicycle LOS Score for Intersection	2.241	2.108	2.347	2.238
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	14.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.202

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	33	23	137	22	25	203
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	37	0	6	13	0	16
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	70	23	143	35	25	219
Peak Hour Factor	0.7420	0.7420	0.7420	0.7420	0.7420	0.7420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	8	48	12	8	74
Total Analysis Volume [veh/h]	94	31	193	47	34	295
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.20	0.04	0.00	0.00	0.03	0.00
d_M, Delay for Movement [s/veh]	14.89	11.50	0.00	0.00	7.76	0.00
Movement LOS	B	B	A	A	A	A
95th-Percentile Queue Length [veh]	0.93	0.93	0.00	0.00	0.97	0.97
95th-Percentile Queue Length [ft]	23.16	23.16	0.00	0.00	24.26	24.26
d_A, Approach Delay [s/veh]	14.05		0.00		0.80	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	2.91					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	19.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.803

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	30	273	43	32	185	94	37	109	28	27	67	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	7	46	0	2	0	0	0	6	16	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	46	280	89	32	187	94	37	109	34	43	67	26
Peak Hour Factor	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	83	26	9	55	28	11	32	10	13	20	8
Total Analysis Volume [veh/h]	54	331	105	38	221	111	44	129	40	51	79	31
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	610	536	607	536	521
Degree of Utilization, x	0.80	0.48	0.18	0.40	0.31

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	7.97	2.61	0.66	1.89	1.30
95th-Percentile Queue Length [ft]	199.33	65.29	16.61	47.29	32.58
Approach Delay [s/veh]	28.52	13.87		14.09	12.97
Approach LOS	D	B		B	B
Intersection Delay [s/veh]	19.61				
Intersection LOS	C				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.578

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	25	224	50	19	169	37	77	105	79	28	46	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	0	0	65	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	247	50	19	234	37	77	105	79	28	46	13
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	62	13	5	59	9	19	26	20	7	12	3
Total Analysis Volume [veh/h]	25	247	50	19	234	37	77	105	79	28	46	13
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.19	0.19	0.01	0.17	0.17	0.05	0.16	0.16	0.02	0.05	0.05
Intersection LOS	A											
Intersection V/C	0.578											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	11.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.559

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	41	113	37	72	119	99	114	1356	49	56	1037	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	25	0	40	14	0	0	0	0	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	41	113	37	97	119	139	128	1356	49	56	1037	67
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	30	10	25	31	36	34	355	13	15	271	18
Total Analysis Volume [veh/h]	43	118	39	102	125	146	134	1420	51	59	1086	70
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	36.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	36	0	0	36	0	0	44	0	0	44	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	51	51	51	51	51	51
g / C, Green / Cycle	0.26	0.26	0.64	0.64	0.64	0.64	0.64	0.64
(v / s)_i Volume / Saturation Flow Rate	0.13	0.23	0.27	0.27	0.27	0.16	0.21	0.21
s, saturation flow rate [veh/h]	1572	1609	494	3618	1866	366	3618	1842
c, Capacity [veh/h]	457	469	348	2329	1202	268	2329	1186
d1, Uniform Delay [s]	24.83	28.59	12.50	6.93	6.93	12.49	6.43	6.43
k, delay calibration	0.11	0.14	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.66	4.08	3.20	0.55	1.07	1.88	0.38	0.74
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.44	0.79	0.38	0.42	0.42	0.22	0.33	0.33
d, Delay for Lane Group [s/veh]	25.49	32.67	15.69	7.48	8.00	14.37	6.81	7.18
Lane Group LOS	C	C	B	A	A	B	A	A
Critical Lane Group	No	Yes	Yes	No	No	No	No	No
50th-Percentile Queue Length [veh]	3.14	7.13	1.73	3.52	3.81	0.74	2.57	2.74
50th-Percentile Queue Length [ft]	78.56	178.22	43.28	88.02	95.14	18.45	64.28	68.52
95th-Percentile Queue Length [veh]	5.66	11.51	3.12	6.34	6.85	1.33	4.63	4.93
95th-Percentile Queue Length [ft]	141.40	287.69	77.90	158.44	171.26	33.22	115.71	123.34

Movement, Approach, & Intersection Results

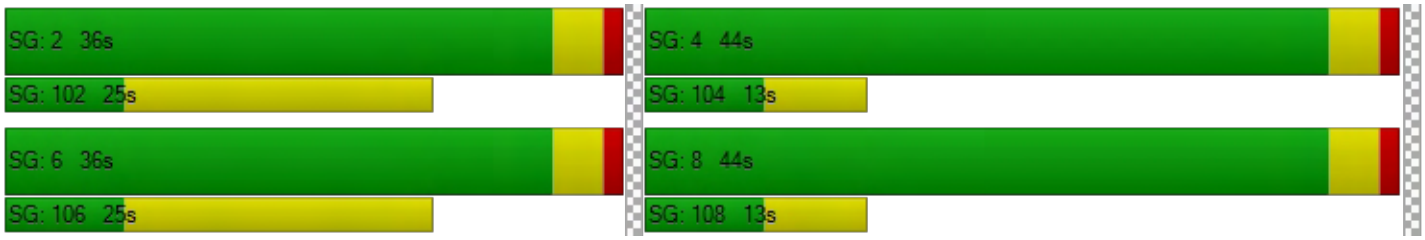
d_M, Delay for Movement [s/veh]	25.49	25.49	25.49	32.67	32.67	32.67	15.69	7.64	8.00	14.37	6.92	7.18
Movement LOS	C	C	C	C	C	C	B	A	A	B	A	A
d_A, Approach Delay [s/veh]	25.49			32.67			8.33			7.30		
Approach LOS	C			C			A			A		
d_I, Intersection Delay [s/veh]	11.65											
Intersection LOS	B											
Intersection V/C	0.559											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.004	2.350	3.050	3.119
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	800	800	1000	1000
d_b, Bicycle Delay [s]	14.40	14.40	10.00	10.00
l_b,int, Bicycle LOS Score for Intersection	1.890	2.175	2.442	2.228
Bicycle LOS	A	B	B	B

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.552

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	12	842	8	105	952	52	76	34	23	7	15	94
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	4	12	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	842	8	105	952	56	88	34	23	7	15	94
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	211	2	26	238	14	22	9	6	2	4	24
Total Analysis Volume [veh/h]	12	842	8	105	952	56	88	34	23	7	15	94
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.26	0.01	0.07	0.30	0.04	0.06	0.08	0.01	0.00	0.07	0.07
Intersection LOS	A											
Intersection V/C	0.552											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.475

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	9	839	12	8	965	13	4	2	45	14	3	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	839	12	8	965	13	4	2	45	14	3	38
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	210	3	2	241	3	1	1	11	4	1	10
Total Analysis Volume [veh/h]	9	839	12	8	965	13	4	2	45	14	3	38
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.27	0.27	0.01	0.31	0.31	0.00	0.03	0.03	0.01	0.03	0.03
Intersection LOS	A											
Intersection V/C	0.475											

Opening Year (2020) Without Project

Signal Hill Business Park

Vistro File: Z:\...\School PM.vistro
Report File: Z:\...\School PM - OY.pdf

Scenario 3 Opening Year Without Project
3/6/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Thru	0.690	-	B
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.571	21.0	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.115	13.6	B
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.691	15.9	C
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	NB Thru	0.576	-	A
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	SB Thru	0.524	10.3	B
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	SB Thru	0.566	-	A
19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	SB Right	0.489	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.690

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	3	16	5	11	1	0	3	1	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	598	45	29	580	45	70	80	42	65	134	49
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	150	11	7	145	11	18	20	11	16	34	12
Total Analysis Volume [veh/h]	50	598	45	29	580	45	70	80	42	65	134	49
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.40	0.40	0.02	0.39	0.39	0.04	0.09	0.03	0.04	0.12	0.03
Intersection LOS	B											
Intersection V/C	0.690											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	21.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.571

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	92	444	251	86	425	124	99	1163	93	168	841	130
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	0	0	6	13	18	10	0	0	17	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	94	461	256	88	440	139	119	1196	95	171	875	133
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	121	67	23	115	36	31	313	25	45	229	35
Total Analysis Volume [veh/h]	98	483	268	92	461	146	125	1252	99	179	916	139
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	13	33	0	16	36	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	37	22	22	22	7	35	35	11	39	39
g / C, Green / Cycle	0.27	0.27	0.46	0.27	0.27	0.27	0.09	0.44	0.44	0.14	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.10	0.13	0.17	0.10	0.13	0.09	0.07	0.25	0.25	0.10	0.20	0.20
s, saturation flow rate [veh/h]	946	3618	1615	927	3618	1615	1810	3618	1830	1810	3618	1775
c, Capacity [veh/h]	223	988	748	215	988	441	164	1581	799	254	1761	864
d1, Uniform Delay [s]	33.03	24.45	13.85	33.33	24.28	23.29	35.63	16.90	16.90	32.88	13.12	13.12
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.36	0.38	0.29	1.35	0.34	0.44	7.21	1.48	2.91	3.56	0.68	1.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.44	0.49	0.36	0.43	0.47	0.33	0.76	0.57	0.57	0.70	0.40	0.40
d, Delay for Lane Group [s/veh]	34.40	24.83	14.14	34.68	24.62	23.73	42.84	18.38	19.81	36.44	13.80	14.52
Lane Group LOS	C	C	B	C	C	C	D	B	B	D	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	1.83	3.68	2.90	1.75	3.55	2.18	2.63	5.95	6.33	3.44	3.82	3.93
50th-Percentile Queue Length [ft]	45.80	92.11	72.39	43.75	88.75	54.54	65.75	148.69	158.32	85.92	95.55	98.19
95th-Percentile Queue Length [veh]	3.30	6.63	5.21	3.15	6.39	3.93	4.73	9.95	10.46	6.19	6.88	7.07
95th-Percentile Queue Length [ft]	82.43	165.79	130.29	78.74	159.75	98.18	118.35	248.67	261.50	154.66	172.00	176.75

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.40	24.83	14.14	34.68	24.62	23.73	42.84	18.79	19.81	36.44	13.97	14.52
Movement LOS	C	C	B	C	C	C	D	B	B	D	B	B
d_A, Approach Delay [s/veh]	22.56			25.76			20.89			17.29		
Approach LOS	C			C			C			B		
d_I, Intersection Delay [s/veh]	20.98											
Intersection LOS	C											
Intersection V/C	0.571											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.747	2.681	3.155	3.181
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	675	675	725	800
d_b, Bicycle Delay [s]	17.56	17.56	16.26	14.40
l_b,int, Bicycle LOS Score for Intersection	2.260	2.136	2.371	2.238
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	13.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.115

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	33	23	137	22	25	203
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	7	0	0	7	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	41	23	140	29	26	207
Peak Hour Factor	0.7420	0.7420	0.7420	0.7420	0.7420	0.7420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	8	47	10	9	70
Total Analysis Volume [veh/h]	55	31	189	39	35	279
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.04	0.00	0.00	0.03	0.00
d_M, Delay for Movement [s/veh]	13.64	10.43	0.00	0.00	7.73	0.00
Movement LOS	B	B	A	A	A	A
95th-Percentile Queue Length [veh]	0.53	0.53	0.00	0.00	0.90	0.90
95th-Percentile Queue Length [ft]	13.30	13.30	0.00	0.00	22.53	22.53
d_A, Approach Delay [s/veh]	12.49		0.00		0.86	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	2.14					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	15.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.691

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	30	273	43	32	185	94	37	109	28	27	67	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	2	0	4	0	0	0	0	3	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	284	46	33	193	96	38	111	29	31	68	27
Peak Hour Factor	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	84	14	10	57	28	11	33	9	9	20	8
Total Analysis Volume [veh/h]	37	336	54	39	228	113	45	131	34	37	80	32
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	618	555	633	557	543
Degree of Utilization, x	0.69	0.48	0.18	0.38	0.27

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	5.46	2.59	0.65	1.75	1.11
95th-Percentile Queue Length [ft]	136.40	64.75	16.16	43.67	27.71
Approach Delay [s/veh]	20.80	13.42		13.33	12.11
Approach LOS	C	B		B	B
Intersection Delay [s/veh]	15.94				
Intersection LOS	C				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.576

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	25	224	50	19	169	37	77	105	79	28	46	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	0	0	6	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	236	51	19	178	38	79	107	81	29	47	13
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	59	13	5	45	10	20	27	20	7	12	3
Total Analysis Volume [veh/h]	26	236	51	19	178	38	79	107	81	29	47	13
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.18	0.18	0.01	0.14	0.14	0.05	0.17	0.17	0.02	0.06	0.06
Intersection LOS	A											
Intersection V/C	0.576											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	10.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.524

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	41	113	37	72	119	99	114	1356	49	56	1037	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	2	4	0	0	10	0	0	17	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	42	121	38	75	125	101	116	1393	50	57	1075	61
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	32	10	20	33	26	30	365	13	15	281	16
Total Analysis Volume [veh/h]	44	127	40	79	131	106	121	1459	52	60	1126	64
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	35.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	32	0	0	32	0	0	48	0	0	48	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	18	18	54	54	54	54	54	54
g / C, Green / Cycle	0.22	0.22	0.68	0.68	0.68	0.68	0.68	0.68
(v / s)_i Volume / Saturation Flow Rate	0.13	0.20	0.25	0.28	0.28	0.17	0.22	0.22
s, saturation flow rate [veh/h]	1590	1612	478	3618	1867	352	3618	1848
c, Capacity [veh/h]	403	410	361	2462	1270	278	2462	1258
d1, Uniform Delay [s]	27.60	30.13	10.06	5.64	5.64	10.46	5.22	5.22
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.05	3.09	2.49	0.50	0.96	1.77	0.34	0.67
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.52	0.77	0.34	0.40	0.40	0.22	0.32	0.32
d, Delay for Lane Group [s/veh]	28.65	33.22	12.55	6.13	6.60	12.23	5.56	5.89
Lane Group LOS	C	C	B	A	A	B	A	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh]	3.58	6.02	1.35	3.08	3.35	0.68	2.25	2.42
50th-Percentile Queue Length [ft]	89.47	150.45	33.66	77.10	83.69	16.96	56.25	60.38
95th-Percentile Queue Length [veh]	6.44	10.04	2.42	5.55	6.03	1.22	4.05	4.35
95th-Percentile Queue Length [ft]	161.05	251.03	60.59	138.78	150.64	30.53	101.25	108.69

Movement, Approach, & Intersection Results

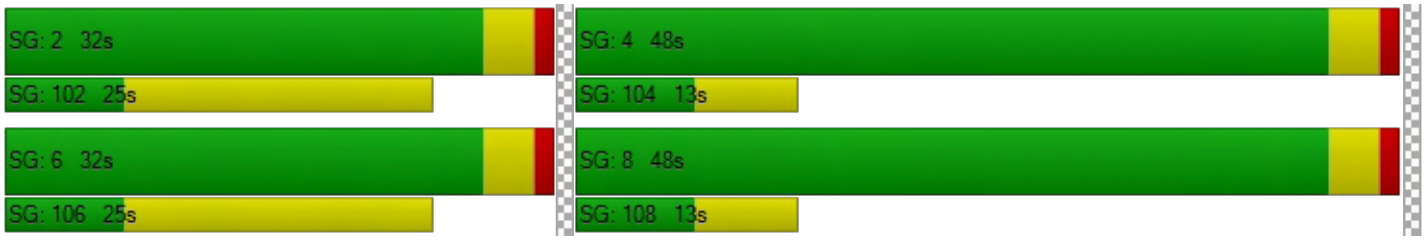
d_M, Delay for Movement [s/veh]	28.65	28.65	28.65	33.22	33.22	33.22	12.55	6.28	6.60	12.23	5.66	5.89
Movement LOS	C	C	C	C	C	C	B	A	A	B	A	A
d_A, Approach Delay [s/veh]	28.65			33.22			6.75			5.99		
Approach LOS	C			C			A			A		
d_I, Intersection Delay [s/veh]	10.28											
Intersection LOS	B											
Intersection V/C	0.524											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.015	2.310	3.055	3.094
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	700	700	1100	1100
d_b, Bicycle Delay [s]	16.90	16.90	8.10	8.10
l_b,int, Bicycle LOS Score for Intersection	1.908	2.081	2.457	2.247
Bicycle LOS	A	B	B	B

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.566

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	12	842	8	105	952	52	76	34	23	7	15	94
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	24	0	3	14	0	0	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	883	8	110	985	53	78	35	23	7	15	101
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	221	2	28	246	13	20	9	6	2	4	25
Total Analysis Volume [veh/h]	12	883	8	110	985	53	78	35	23	7	15	101
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.28	0.01	0.07	0.31	0.03	0.05	0.07	0.01	0.00	0.07	0.07
Intersection LOS	A											
Intersection V/C	0.566											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.489

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	9	839	12	8	965	13	4	2	45	14	3	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	19	0	3	11	0	0	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	875	12	11	995	13	4	2	46	14	3	44
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	219	3	3	249	3	1	1	12	4	1	11
Total Analysis Volume [veh/h]	9	875	12	11	995	13	4	2	46	14	3	44
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.28	0.28	0.01	0.32	0.32	0.00	0.03	0.03	0.01	0.04	0.04
Intersection LOS	A											
Intersection V/C	0.489											

Opening Year (2020) With Project

Signal Hill Business Park

Vistro File: Z:\...\School PM.vistro
Report File: Z:\...\School PM - OYP.pdf

Scenario 4 Opening Year With Project
3/6/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Thru	0.703	-	C
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.580	21.1	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.231	15.5	C
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.850	22.2	C
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	NB Thru	0.591	-	A
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	SB Right	0.586	12.1	B
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	SB Thru	0.573	-	A
19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	SB Right	0.489	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.703

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	20	16	5	11	3	0	3	8	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	598	45	46	580	45	70	82	42	65	141	94
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	150	11	12	145	11	18	21	11	16	35	24
Total Analysis Volume [veh/h]	50	598	45	46	580	45	70	82	42	65	141	94
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.40	0.40	0.03	0.39	0.39	0.04	0.10	0.03	0.04	0.13	0.06
Intersection LOS	C											
Intersection V/C	0.703											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	21.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.580

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	92	444	251	86	425	124	99	1163	93	168	841	130
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	2	0	6	13	18	22	0	7	50	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	94	461	258	88	440	139	119	1208	95	178	908	133
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	121	68	23	115	36	31	316	25	47	238	35
Total Analysis Volume [veh/h]	98	483	270	92	461	146	125	1265	99	186	951	139
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	13	33	0	16	36	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	37	22	22	22	7	35	35	11	39	39
g / C, Green / Cycle	0.27	0.27	0.46	0.27	0.27	0.27	0.09	0.44	0.44	0.14	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.10	0.13	0.17	0.10	0.13	0.09	0.07	0.25	0.25	0.10	0.20	0.20
s, saturation flow rate [veh/h]	946	3618	1615	927	3618	1615	1810	3618	1830	1810	3618	1779
c, Capacity [veh/h]	223	988	750	215	988	441	164	1576	797	256	1761	866
d1, Uniform Delay [s]	33.03	24.45	13.80	33.32	24.28	23.29	35.63	17.03	17.03	32.92	13.23	13.23
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.36	0.38	0.29	1.35	0.34	0.44	7.21	1.53	3.00	3.90	0.72	1.47
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.44	0.49	0.36	0.43	0.47	0.33	0.76	0.57	0.57	0.73	0.41	0.42
d, Delay for Lane Group [s/veh]	34.39	24.82	14.09	34.68	24.62	23.72	42.84	18.56	20.03	36.83	13.95	14.70
Lane Group LOS	C	C	B	C	C	C	D	B	C	D	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	1.83	3.68	2.91	1.75	3.55	2.18	2.63	6.05	6.44	3.60	3.98	4.10
50th-Percentile Queue Length [ft]	45.79	92.10	72.80	43.74	88.74	54.54	65.75	151.13	161.07	89.91	99.53	102.47
95th-Percentile Queue Length [veh]	3.30	6.63	5.24	3.15	6.39	3.93	4.73	10.08	10.61	6.47	7.17	7.38
95th-Percentile Queue Length [ft]	82.43	165.78	131.05	78.74	159.74	98.17	118.35	251.93	265.14	161.84	179.16	184.45

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.39	24.82	14.09	34.68	24.62	23.72	42.84	18.98	20.03	36.83	14.12	14.70
Movement LOS	C	C	B	C	C	C	D	B	C	D	B	B
d_A, Approach Delay [s/veh]	22.52			25.76			21.05			17.49		
Approach LOS	C			C			C			B		
d_I, Intersection Delay [s/veh]	21.05											
Intersection LOS	C											
Intersection V/C	0.580											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.749	2.681	3.163	3.190
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	675	675	725	800
d_b, Bicycle Delay [s]	17.56	17.56	16.26	14.40
l_b,int, Bicycle LOS Score for Intersection	2.262	2.136	2.379	2.261
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	15.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.231

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	33	23	137	22	25	203
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	44	0	6	20	0	16
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	78	23	146	42	26	223
Peak Hour Factor	0.7420	0.7420	0.7420	0.7420	0.7420	0.7420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	8	49	14	9	75
Total Analysis Volume [veh/h]	105	31	197	57	35	301
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.23	0.04	0.00	0.00	0.03	0.00
d_M, Delay for Movement [s/veh]	15.52	11.99	0.00	0.00	7.80	0.00
Movement LOS	C	B	A	A	A	A
95th-Percentile Queue Length [veh]	1.08	1.08	0.00	0.00	1.01	1.01
95th-Percentile Queue Length [ft]	26.95	26.95	0.00	0.00	25.33	25.33
d_A, Approach Delay [s/veh]	14.71		0.00		0.81	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	3.13					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	22.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.850

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	30	273	43	32	185	94	37	109	28	27	67	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	13	48	0	6	0	0	0	6	19	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	47	291	92	33	195	96	38	111	35	47	68	27
Peak Hour Factor	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	86	27	10	58	28	11	33	10	14	20	8
Total Analysis Volume [veh/h]	56	344	109	39	230	113	45	131	41	56	80	32
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	599	525	593	522	508
Degree of Utilization, x	0.85	0.51	0.19	0.42	0.33

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	9.31	2.90	0.70	2.03	1.43
95th-Percentile Queue Length [ft]	232.68	72.38	17.46	50.66	35.86
Approach Delay [s/veh]	33.95	14.68		14.71	13.55
Approach LOS	D	B		B	B
Intersection Delay [s/veh]	22.22				
Intersection LOS	C				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.591

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	25	224	50	19	169	37	77	105	79	28	46	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	31	0	0	71	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	259	51	19	243	38	79	107	81	29	47	13
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	65	13	5	61	10	20	27	20	7	12	3
Total Analysis Volume [veh/h]	26	259	51	19	243	38	79	107	81	29	47	13
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.19	0.19	0.01	0.18	0.18	0.05	0.17	0.17	0.02	0.06	0.06
Intersection LOS	A											
Intersection V/C	0.591											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	12.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.586

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	41	113	37	72	119	99	114	1356	49	56	1037	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	27	4	40	14	10	0	0	17	11
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	42	121	38	100	125	141	130	1393	50	57	1075	70
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	32	10	26	33	37	34	365	13	15	281	18
Total Analysis Volume [veh/h]	44	127	40	105	131	148	136	1459	52	60	1126	73
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	35.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	36	0	0	36	0	0	44	0	0	44	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	51	51	51	51	51	51
g / C, Green / Cycle	0.27	0.27	0.63	0.63	0.63	0.63	0.63	0.63
(v / s)_i Volume / Saturation Flow Rate	0.13	0.24	0.29	0.28	0.28	0.17	0.22	0.22
s, saturation flow rate [veh/h]	1573	1597	474	3618	1867	352	3618	1841
c, Capacity [veh/h]	471	480	331	2297	1186	256	2297	1169
d1, Uniform Delay [s]	24.41	28.26	13.60	7.35	7.35	13.45	6.82	6.82
k, delay calibration	0.11	0.16	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.67	4.54	3.75	0.60	1.16	2.14	0.41	0.81
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.45	0.80	0.41	0.43	0.43	0.23	0.35	0.35
d, Delay for Lane Group [s/veh]	25.08	32.79	17.35	7.95	8.51	15.59	7.23	7.63
Lane Group LOS	C	C	B	A	A	B	A	A
Critical Lane Group	No	Yes	Yes	No	No	No	No	No
50th-Percentile Queue Length [veh]	3.29	7.38	1.88	3.79	4.10	0.79	2.80	2.98
50th-Percentile Queue Length [ft]	82.24	184.51	47.08	94.78	102.46	19.83	69.90	74.45
95th-Percentile Queue Length [veh]	5.92	11.84	3.39	6.82	7.38	1.43	5.03	5.36
95th-Percentile Queue Length [ft]	148.04	295.90	84.74	170.60	184.42	35.70	125.82	134.01

Movement, Approach, & Intersection Results

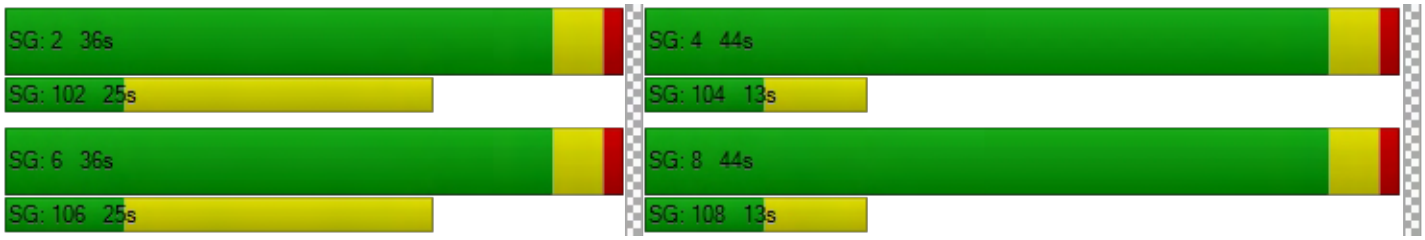
d_M, Delay for Movement [s/veh]	25.08	25.08	25.08	32.79	32.79	32.79	17.35	8.12	8.51	15.59	7.35	7.63
Movement LOS	C	C	C	C	C	C	B	A	A	B	A	A
d_A, Approach Delay [s/veh]	25.08			32.79			8.90			7.76		
Approach LOS	C			C			A			A		
d_I, Intersection Delay [s/veh]	12.09											
Intersection LOS	B											
Intersection V/C	0.586											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.015	2.361	3.063	3.135
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	800	800	1000	1000
d_b, Bicycle Delay [s]	14.40	14.40	10.00	10.00
l_b,int, Bicycle LOS Score for Intersection	1.908	2.193	2.465	2.252
Bicycle LOS	A	B	B	B

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.573

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	12	842	8	105	952	52	76	34	23	7	15	94
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	24	0	3	14	4	12	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	883	8	110	985	57	90	35	23	7	15	101
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	221	2	28	246	14	23	9	6	2	4	25
Total Analysis Volume [veh/h]	12	883	8	110	985	57	90	35	23	7	15	101
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.28	0.01	0.07	0.31	0.04	0.06	0.08	0.01	0.00	0.07	0.07
Intersection LOS	A											
Intersection V/C	0.573											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.489

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	9	839	12	8	965	13	4	2	45	14	3	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	19	0	3	11	0	0	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	875	12	11	995	13	4	2	46	14	3	44
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	219	3	3	249	3	1	1	12	4	1	11
Total Analysis Volume [veh/h]	9	875	12	11	995	13	4	2	46	14	3	44
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.28	0.28	0.01	0.32	0.32	0.00	0.03	0.03	0.01	0.04	0.04
Intersection LOS	A											
Intersection V/C	0.489											

General Plan Buildout Without Project

Signal Hill Business Park

Vistro File: Z:\...\School PM.vistro
Report File: Z:\...\School PM - GP.pdf

Scenario 5 General Plan Buildout Without Project
3/6/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Thru	0.802	-	D
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.681	24.0	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.153	15.6	C
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	NB Thru	0.929	29.1	D
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	NB Right	0.648	-	B
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	SB Thru	0.689	12.7	B
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	SB Thru	0.655	-	B
19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	SB Thru	0.564	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.802

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	3	16	5	11	1	0	3	1	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	711	53	34	691	53	82	95	50	77	160	58
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	178	13	9	173	13	21	24	13	19	40	15
Total Analysis Volume [veh/h]	60	711	53	34	691	53	82	95	50	77	160	58
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.48	0.48	0.02	0.47	0.47	0.05	0.11	0.03	0.05	0.15	0.04
Intersection LOS	D											
Intersection V/C	0.802											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	24.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.681

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	92	444	251	86	425	124	99	1163	93	168	841	130
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	0	0	6	13	18	10	0	0	17	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	112	550	306	105	525	164	139	1429	113	205	1043	159
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	144	80	27	137	43	36	374	30	54	273	42
Total Analysis Volume [veh/h]	117	576	320	110	550	172	146	1496	118	215	1092	166
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	13	33	0	16	36	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	25	25	41	25	25	25	8	31	31	12	35	35
g / C, Green / Cycle	0.31	0.31	0.51	0.31	0.31	0.31	0.10	0.39	0.39	0.15	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.13	0.16	0.20	0.13	0.15	0.11	0.08	0.30	0.30	0.12	0.23	0.23
s, saturation flow rate [veh/h]	871	3618	1615	850	3618	1615	1810	3618	1830	1810	3618	1774
c, Capacity [veh/h]	237	1141	831	228	1141	509	185	1396	706	270	1565	768
d1, Uniform Delay [s]	31.95	22.34	11.79	32.30	22.15	21.02	35.15	21.48	21.49	32.95	16.83	16.83
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.58	0.35	0.29	1.58	0.32	0.39	7.32	4.09	7.87	5.37	1.34	2.71
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.49	0.50	0.39	0.48	0.48	0.34	0.79	0.77	0.77	0.80	0.54	0.54
d, Delay for Lane Group [s/veh]	33.53	22.69	12.08	33.88	22.47	21.41	42.46	25.57	29.37	38.31	18.17	19.54
Lane Group LOS	C	C	B	C	C	C	D	C	C	D	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	2.18	4.21	3.15	2.09	4.06	2.43	3.06	8.81	9.67	4.26	5.50	5.69
50th-Percentile Queue Length [ft]	54.60	105.30	78.64	52.31	101.49	60.87	76.43	220.25	241.78	106.57	137.62	142.32
95th-Percentile Queue Length [veh]	3.93	7.58	5.66	3.77	7.31	4.38	5.50	13.68	14.77	7.65	9.35	9.61
95th-Percentile Queue Length [ft]	98.29	189.45	141.56	94.16	182.68	109.57	137.58	341.94	369.29	191.22	233.82	240.14

Movement, Approach, & Intersection Results

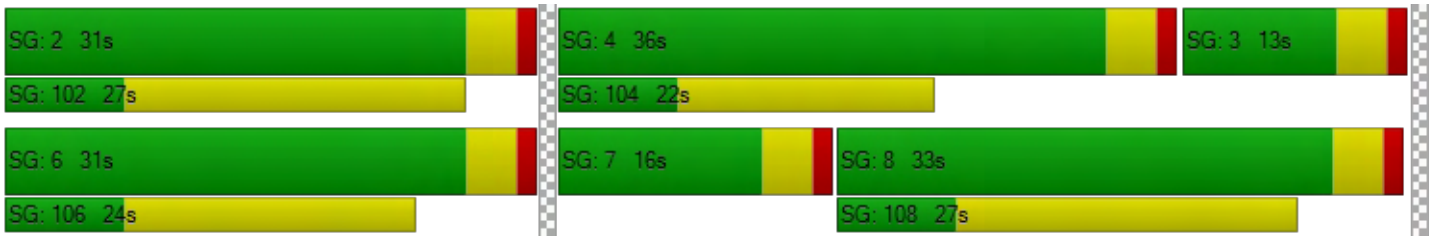
d_M, Delay for Movement [s/veh]	33.53	22.69	12.08	33.88	22.47	21.41	42.46	26.65	29.37	38.31	18.48	19.54
Movement LOS	C	C	B	C	C	C	D	C	C	D	B	B
d_A, Approach Delay [s/veh]	20.59			23.76			28.14			21.49		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	23.99											
Intersection LOS	C											
Intersection V/C	0.681											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.806	2.726	3.264	3.296
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	675	675	725	800
d_b, Bicycle Delay [s]	17.56	17.56	16.26	14.40
l_b,int, Bicycle LOS Score for Intersection	2.395	2.246	2.528	2.370
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	15.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.153

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	33	23	137	22	25	203
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	7	0	0	7	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	47	28	167	34	31	248
Peak Hour Factor	0.7420	0.7420	0.7420	0.7420	0.7420	0.7420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	9	56	11	10	84
Total Analysis Volume [veh/h]	63	38	225	46	42	334
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.15	0.05	0.00	0.00	0.03	0.00
d_M, Delay for Movement [s/veh]	15.56	11.32	0.00	0.00	7.85	0.00
Movement LOS	C	B	A	A	A	A
95th-Percentile Queue Length [veh]	0.74	0.74	0.00	0.00	1.20	1.20
95th-Percentile Queue Length [ft]	18.61	18.61	0.00	0.00	30.07	30.07
d_A, Approach Delay [s/veh]	13.97		0.00		0.88	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	2.33					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	29.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.929

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	30	273	43	32	185	94	37	109	28	27	67	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	2	0	4	0	0	0	0	3	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	37	339	54	39	230	115	45	133	34	36	82	32
Peak Hour Factor	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	100	16	12	68	34	13	39	10	11	24	9
Total Analysis Volume [veh/h]	44	401	64	46	272	136	53	157	40	43	97	38
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	548	492	552	486	468
Degree of Utilization, x	0.93	0.65	0.25	0.51	0.38

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	11.60	4.54	0.96	2.89	1.75
95th-Percentile Queue Length [ft]	289.89	113.38	24.07	72.30	43.78
Approach Delay [s/veh]	48.38	19.10		17.98	15.30
Approach LOS	E	C		C	C
Intersection Delay [s/veh]	29.12				
Intersection LOS	D				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.648

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	25	224	50	19	169	37	77	105	79	28	46	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	0	0	6	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	281	61	23	212	45	94	128	96	34	56	16
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	70	15	6	53	11	24	32	24	9	14	4
Total Analysis Volume [veh/h]	31	281	61	23	212	45	94	128	96	34	56	16
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.21	0.21	0.01	0.16	0.16	0.06	0.20	0.20	0.02	0.07	0.07
Intersection LOS	B											
Intersection V/C	0.648											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	12.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.689

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	41	113	37	72	119	99	114	1356	49	56	1037	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	2	4	0	0	10	0	0	17	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	144	45	90	149	121	139	1664	60	68	1282	73
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	38	12	24	39	32	36	436	16	18	336	19
Total Analysis Volume [veh/h]	52	151	47	94	156	127	146	1742	63	71	1342	76
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	42.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	31	0	0	31	0	0	49	0	0	49	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	51	51	51	51	51	51
g / C, Green / Cycle	0.26	0.26	0.64	0.64	0.64	0.64	0.64	0.64
(v / s)_i Volume / Saturation Flow Rate	0.16	0.24	0.38	0.33	0.33	0.27	0.26	0.26
s, saturation flow rate [veh/h]	1530	1567	385	3618	1866	265	3618	1848
c, Capacity [veh/h]	458	470	277	2301	1187	205	2301	1176
d1, Uniform Delay [s]	25.21	28.39	17.06	7.89	7.90	17.46	7.15	7.15
k, delay calibration	0.11	0.19	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.01	5.49	7.03	0.83	1.62	4.58	0.54	1.05
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.55	0.80	0.53	0.52	0.52	0.35	0.41	0.41
d, Delay for Lane Group [s/veh]	26.22	33.88	24.09	8.73	9.52	22.04	7.69	8.20
Lane Group LOS	C	C	C	A	A	C	A	A
Critical Lane Group	No	Yes	Yes	No	No	No	No	No
50th-Percentile Queue Length [veh]	4.06	7.40	2.55	4.89	5.32	1.20	3.47	3.72
50th-Percentile Queue Length [ft]	101.50	185.06	63.85	122.20	132.91	30.01	86.87	92.96
95th-Percentile Queue Length [veh]	7.31	11.86	4.60	8.51	9.10	2.16	6.25	6.69
95th-Percentile Queue Length [ft]	182.71	296.61	114.93	212.85	227.44	54.02	156.37	167.32

Movement, Approach, & Intersection Results

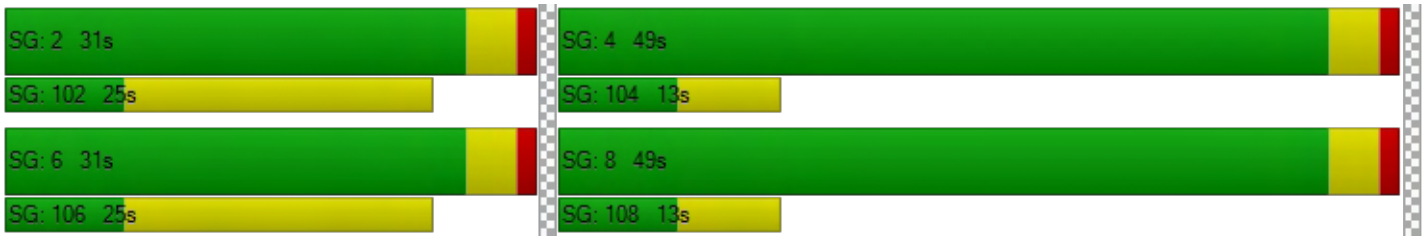
d_M, Delay for Movement [s/veh]	26.22	26.22	26.22	33.88	33.88	33.88	24.09	8.98	9.52	22.04	7.84	8.20
Movement LOS	C	C	C	C	C	C	C	A	A	C	A	A
d_A, Approach Delay [s/veh]	26.22			33.88			10.13			8.54		
Approach LOS	C			C			B			A		
d_I, Intersection Delay [s/veh]	12.74											
Intersection LOS	B											
Intersection V/C	0.689											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.072	2.385	3.145	3.191
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	675	675	1125	1125
d_b, Bicycle Delay [s]	17.56	17.56	7.66	7.66
l_b,int, Bicycle LOS Score for Intersection	1.972	2.182	2.633	2.379
Bicycle LOS	A	B	B	B

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.655

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	12	842	8	105	952	52	76	34	23	7	15	94
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	24	0	3	14	0	0	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	1051	10	131	1175	63	93	41	28	9	18	120
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	263	3	33	294	16	23	10	7	2	5	30
Total Analysis Volume [veh/h]	15	1051	10	131	1175	63	93	41	28	9	18	120
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.33	0.01	0.08	0.37	0.04	0.06	0.08	0.02	0.01	0.09	0.09
Intersection LOS	B											
Intersection V/C	0.655											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.564

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	9	839	12	8	965	13	4	2	45	14	3	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	19	0	3	11	0	0	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	1043	15	13	1188	16	5	2	55	17	4	51
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	261	4	3	297	4	1	1	14	4	1	13
Total Analysis Volume [veh/h]	11	1043	15	13	1188	16	5	2	55	17	4	51
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.33	0.33	0.01	0.38	0.38	0.00	0.04	0.04	0.01	0.05	0.05
Intersection LOS	A											
Intersection V/C	0.564											

General Plan Buildout With Project

Signal Hill Business Park

Vistro File: Z:\...\School PM.vistro
Report File: Z:\...\School PM - GPP.pdf

Scenario 6 General Plan Buildout With Project
3/6/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
4	Orange Ave (NS) at Hill St (EW)	Signalized	ICU 1	NB Thru	0.813	-	D
5	Orange Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	EB Left	0.690	24.2	C
6	Gundry Ave (NS) at Hill St (EW)	Two-way stop	HCM 6th Edition	NB Left	0.290	18.3	C
10	Walnut Ave (NS) at Hill St (EW)	All-way stop	HCM 6th Edition	NB Thru	1.101	48.6	E
11	Walnut Ave (NS) at 20th St/Alamitos Ave (EW)	Signalized	ICU 1	NB Thru	0.663	-	B
12	Walnut Ave (NS) at Pacific Coast Hwy (EW)	Signalized	HCM 6th Edition	SB Right	0.784	15.2	B
18	Cherry Ave (NS) at 21st St (EW)	Signalized	ICU 1	SB Thru	0.662	-	B
19	Cherry Ave (NS) at 20th St (EW)	Signalized	ICU 1	SB Thru	0.564	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.813

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	20	16	5	11	3	0	3	8	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	711	53	51	691	53	82	97	50	77	167	103
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	178	13	13	173	13	21	24	13	19	42	26
Total Analysis Volume [veh/h]	60	711	53	51	691	53	82	97	50	77	167	103
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.48	0.48	0.03	0.47	0.47	0.05	0.11	0.03	0.05	0.15	0.06
Intersection LOS	D											
Intersection V/C	0.813											

Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	24.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.690

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	92	444	251	86	425	124	99	1163	93	168	841	130
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	2	0	6	13	18	22	0	7	50	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	112	550	308	105	525	164	139	1441	113	212	1076	159
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	144	81	27	137	43	36	377	30	55	282	42
Total Analysis Volume [veh/h]	117	576	323	110	550	172	146	1509	118	222	1127	166
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	13	33	0	16	36	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	25	25	41	25	25	25	8	31	31	12	35	35
g / C, Green / Cycle	0.31	0.31	0.51	0.31	0.31	0.31	0.10	0.39	0.39	0.15	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.13	0.16	0.20	0.13	0.15	0.11	0.08	0.30	0.30	0.12	0.24	0.24
s, saturation flow rate [veh/h]	871	3618	1615	850	3618	1615	1810	3618	1830	1810	3618	1778
c, Capacity [veh/h]	237	1141	833	228	1141	510	185	1392	704	272	1565	769
d1, Uniform Delay [s]	31.94	22.34	11.76	32.30	22.15	21.02	35.15	21.63	21.65	33.00	16.97	16.97
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.58	0.35	0.30	1.58	0.32	0.39	7.32	4.30	8.24	5.96	1.42	2.87
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.49	0.50	0.39	0.48	0.48	0.34	0.79	0.78	0.78	0.82	0.55	0.55
d, Delay for Lane Group [s/veh]	33.52	22.69	12.06	33.88	22.47	21.41	42.46	25.93	29.89	38.96	18.39	19.84
Lane Group LOS	C	C	B	C	C	C	D	C	C	D	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	2.18	4.21	3.17	2.09	4.06	2.43	3.06	8.96	9.86	4.45	5.71	5.92
50th-Percentile Queue Length [ft]	54.60	105.29	79.30	52.31	101.48	60.87	76.43	223.94	246.40	111.18	142.73	148.03
95th-Percentile Queue Length [veh]	3.93	7.58	5.71	3.77	7.31	4.38	5.50	13.87	15.00	7.91	9.63	9.91
95th-Percentile Queue Length [ft]	98.28	189.44	142.75	94.16	182.66	109.56	137.58	346.65	375.12	197.65	240.69	247.79

Movement, Approach, & Intersection Results

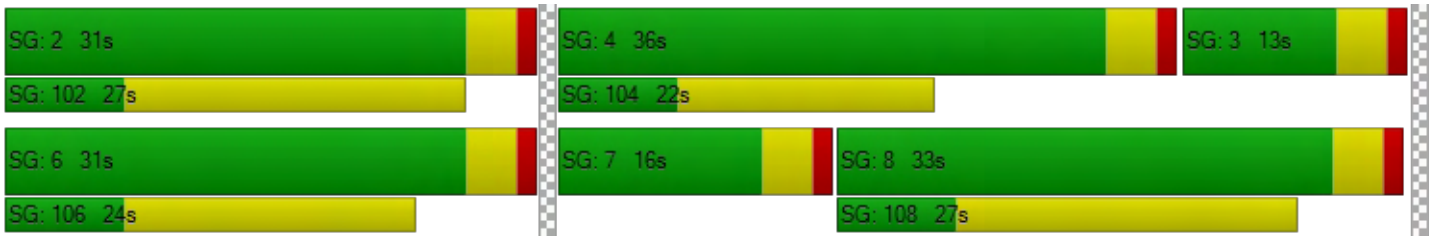
d_M, Delay for Movement [s/veh]	33.52	22.69	12.06	33.88	22.47	21.41	42.46	27.06	29.89	38.96	18.72	19.84
Movement LOS	C	C	B	C	C	C	D	C	C	D	B	B
d_A, Approach Delay [s/veh]	20.56			23.76			28.51			21.81		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	24.19											
Intersection LOS	C											
Intersection V/C	0.690											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.808	2.726	3.272	3.306
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	675	675	725	800
d_b, Bicycle Delay [s]	17.56	17.56	16.26	14.40
l_b,int, Bicycle LOS Score for Intersection	2.398	2.246	2.535	2.393
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Gundry Ave (NS) at Hill St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	18.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.290

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name						
Base Volume Input [veh/h]	33	23	137	22	25	203
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	44	0	6	20	0	16
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	84	28	173	47	31	264
Peak Hour Factor	0.7420	0.7420	0.7420	0.7420	0.7420	0.7420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	9	58	16	10	89
Total Analysis Volume [veh/h]	113	38	233	63	42	356
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.29	0.05	0.00	0.00	0.03	0.00
d_M, Delay for Movement [s/veh]	18.33	13.71	0.00	0.00	7.92	0.00
Movement LOS	C	B	A	A	A	A
95th-Percentile Queue Length [veh]	1.48	1.48	0.00	0.00	1.34	1.34
95th-Percentile Queue Length [ft]	36.97	36.97	0.00	0.00	33.55	33.55
d_A, Approach Delay [s/veh]	17.17		0.00		0.84	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	3.46					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 10: Walnut Ave (NS) at Hill St (EW)

Control Type:	All-way stop	Delay (sec / veh):	48.6
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.101

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	30	273	43	32	185	94	37	109	28	27	67	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	13	48	0	6	0	0	0	6	19	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	53	346	100	39	232	115	45	133	40	52	82	32
Peak Hour Factor	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460	0.8460
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	102	30	12	69	34	13	39	12	15	24	9
Total Analysis Volume [veh/h]	63	409	118	46	274	136	53	157	47	61	97	38
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	590	484	540	478	463
Degree of Utilization, x	1.10	0.66	0.25	0.54	0.42

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	18.62	4.77	0.99	3.12	2.08
95th-Percentile Queue Length [ft]	465.60	119.16	24.81	78.10	51.92
Approach Delay [s/veh]	94.32	20.00		18.89	16.39
Approach LOS	F	C		C	C
Intersection Delay [s/veh]	48.59				
Intersection LOS	E				

Intersection Level Of Service Report

Intersection 11: Walnut Ave (NS) at 20th St/Alamitos Ave (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.663

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	25	224	50	19	169	37	77	105	79	28	46	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	31	0	0	71	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	304	61	23	277	45	94	128	96	34	56	16
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	76	15	6	69	11	24	32	24	9	14	4
Total Analysis Volume [veh/h]	31	304	61	23	277	45	94	128	96	34	56	16
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.23	0.23	0.01	0.20	0.20	0.06	0.20	0.20	0.02	0.07	0.07
Intersection LOS	B											
Intersection V/C	0.663											

Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	15.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.784

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	41	113	37	72	119	99	114	1356	49	56	1037	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	27	4	40	14	10	0	0	17	11
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	144	45	115	149	161	153	1664	60	68	1282	82
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	38	12	30	39	42	40	436	16	18	336	21
Total Analysis Volume [veh/h]	52	151	47	120	156	169	160	1742	63	71	1342	86
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	44.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	33	0	0	33	0	0	47	0	0	47	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	25	25	47	47	47	47	47	47
g / C, Green / Cycle	0.31	0.31	0.59	0.59	0.59	0.59	0.59	0.59
(v / s)_i Volume / Saturation Flow Rate	0.17	0.29	0.42	0.33	0.33	0.27	0.26	0.26
s, saturation flow rate [veh/h]	1511	1557	381	3618	1866	265	3618	1842
c, Capacity [veh/h]	519	536	252	2144	1106	188	2144	1092
d1, Uniform Delay [s]	22.23	26.73	22.76	9.88	9.89	21.67	8.98	8.98
k, delay calibration	0.11	0.28	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.70	8.22	11.59	1.04	2.02	5.69	0.66	1.30
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.48	0.83	0.63	0.55	0.56	0.38	0.44	0.44
d, Delay for Lane Group [s/veh]	22.93	34.95	34.35	10.92	11.91	27.37	9.64	10.27
Lane Group LOS	C	C	C	B	B	C	A	B
Critical Lane Group	No	Yes	Yes	No	No	No	No	No
50th-Percentile Queue Length [veh]	3.71	9.00	3.54	5.79	6.29	1.38	4.16	4.43
50th-Percentile Queue Length [ft]	92.80	224.97	88.55	144.72	157.28	34.42	103.91	110.63
95th-Percentile Queue Length [veh]	6.68	13.92	6.38	9.73	10.40	2.48	7.48	7.88
95th-Percentile Queue Length [ft]	167.04	347.96	159.38	243.37	260.12	61.95	187.04	196.88

Movement, Approach, & Intersection Results

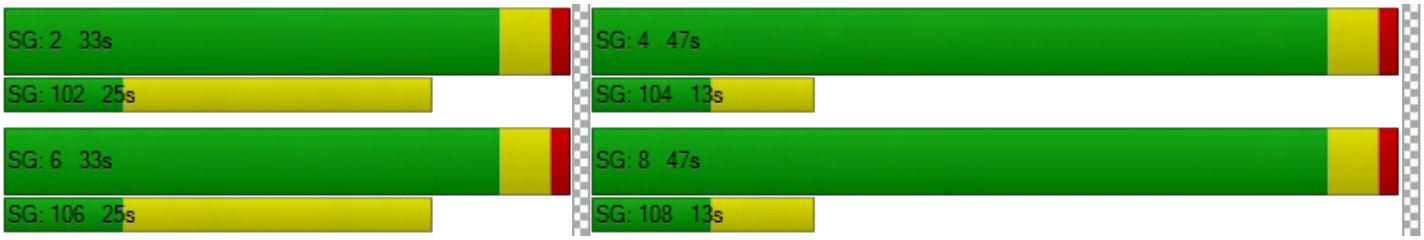
d_M, Delay for Movement [s/veh]	22.93	22.93	22.93	34.95	34.95	34.95	34.35	11.23	11.91	27.37	9.83	10.27
Movement LOS	C	C	C	C	C	C	C	B	B	C	A	B
d_A, Approach Delay [s/veh]	22.93			34.95			13.14			10.68		
Approach LOS	C			C			B			B		
d_I, Intersection Delay [s/veh]	15.18											
Intersection LOS	B											
Intersection V/C	0.784											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.072	2.435	3.153	3.233
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	725	725	1075	1075
d_b, Bicycle Delay [s]	16.26	16.26	8.56	8.56
l_b,int, Bicycle LOS Score for Intersection	1.972	2.294	2.640	2.384
Bicycle LOS	A	B	B	B

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 18: Cherry Ave (NS) at 21st St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.662

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	0	1	0	0
Pocket Length [ft]	110.00	100.00	100.00	198.00	100.00	100.00	100.00	100.00	100.00	96.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	12	842	8	105	952	52	76	34	23	7	15	94
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	24	0	3	14	4	12	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	1051	10	131	1175	67	105	41	28	9	18	120
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	263	3	33	294	17	26	10	7	2	5	30
Total Analysis Volume [veh/h]	15	1051	10	131	1175	67	105	41	28	9	18	120
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.33	0.01	0.08	0.37	0.04	0.07	0.09	0.02	0.01	0.09	0.09
Intersection LOS	B											
Intersection V/C	0.662											

Intersection Level Of Service Report
Intersection 19: Cherry Ave (NS) at 20th St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.564

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	80.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	9	839	12	8	965	13	4	2	45	14	3	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	19	0	3	11	0	0	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	1043	15	13	1188	16	5	2	55	17	4	51
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	261	4	3	297	4	1	1	14	4	1	13
Total Analysis Volume [veh/h]	11	1043	15	13	1188	16	5	2	55	17	4	51
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.33	0.33	0.01	0.38	0.38	0.00	0.04	0.04	0.01	0.05	0.05
Intersection LOS	A											
Intersection V/C	0.564											

APPENDIX D

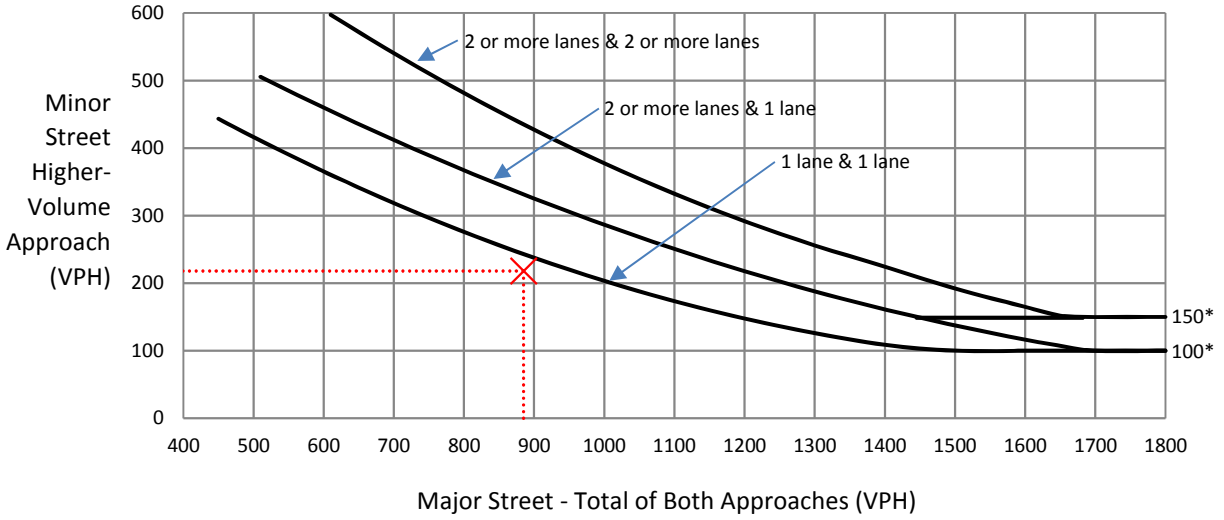
Peak Hour Traffic Signal Warrant Worksheet

Figure C-1

Walnut Ave (NS) / Hill St (EW) - #10
General Plan Buildout With Project
School PM Peak Hour

Major Street:	Walnut Ave	Volume:	885
Minor Street:	Hill St	Volume:	218

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Kunzman Associates, Inc.

OVER 40 YEARS OF EXCELLENT SERVICE

1111 Town & Country Road, Suite 34
Orange, California 92868
(714) 973-8383

www.kainc.us

August 13, 2018

Mr. Steven Christie, Development Manager
XEBEC REALTY PARTNERS
3010 Old Ranch Parkway, Suite 470
Seal Beach, CA 90740

Dear Mr. Christie:

INTRODUCTION

Kunzman Associates, Inc. is pleased to submit this supplemental traffic memorandum regarding our assessment of the potential for cut through traffic resulting from the proposed Signal Hill Business Center project.

This traffic analysis supplements the Signal Hill Business Center Traffic Impact Analysis prepared by Kunzman Associates, Inc. (Revised June 22, 2018). The project site is generally bounded by Gundry Avenue to the west, Gundry Hill Apartments and American University of Health Sciences to the north, Gaviota Avenue to the east, and the Signal Hill City Limits and Alamitos Avenue to the south. The project site is currently vacant. The project site is proposed to consist of developing the project site with a business park consisting of nine buildings totaling 139,080 square feet plus 12,000 square feet of mezzanine, for a total of 151,080 square feet of gross floor area. Full access driveways are proposed at Gundry Avenue, Walnut Avenue, and Alamitos Avenue. The proposed project is anticipated to be constructed and fully operational by Year 2019.

Although this is a technical report, every effort has been made to write the report clearly and concisely. To assist the reader with those terms unique to transportation engineering, a glossary of terms is provided within Appendix A.

POTENTIAL FOR CUT THROUGH TRAFFIC ON GAVIOTA AVENUE

City of Signal Hill staff has reported citizen concerns regarding the potential for cut through traffic on Gaviota Avenue resulting from traffic diversion to avoid congestion at the intersection of Walnut Avenue and Hill Street during peak commute and school hours.

Figure 1 shows the project site plan and proposed access points. As shown on Figure 1, no project access is proposed at Gaviota Avenue.

Figures 2 through 5 show the project trip distribution patterns based on the original trip distribution forecasts contained in the Signal Hill Business Center Traffic Impact Analysis, with the addition of the potential alternative paths if project trips divert to avoid congestion at Walnut Avenue/Hill Street. As

shown on Figures 2 through 5, project trips seeking to avoid the intersection of Walnut Avenue and Hill Street are more likely to use Alamitos Avenue/21st Street or 20th Street based on the location of the proposed project driveway since that is a more direct path to/from Cherry Avenue.

Diverting traffic is not expected to use Gaviota Avenue since that will likely result in longer travel time compared to using Alamitos Avenue/21st Street or 20th Street. For example, a vehicle exiting the project site from Alamitos Avenue and travelling to northbound Cherry Avenue would have to yield to oncoming traffic before turning left on Gaviota, then stop before turning right at Hill Street, whereas staying on Alamitos Avenue/21st Street would not require any yields or stops for the same vehicle to access Cherry Avenue.

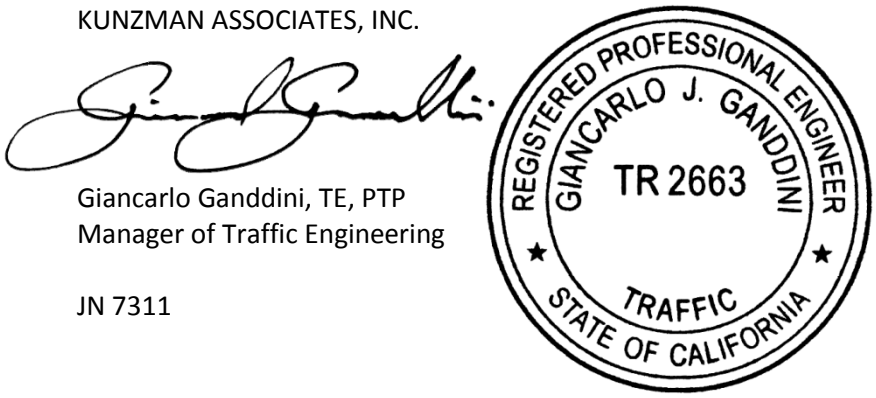
CONCLUSION

If project trips are seeking to avoid the intersection of Walnut Avenue and Hill Street, there are more convenient routes available that do not involve travelling on Gaviota Avenue. Therefore, the project impact of cut through traffic on Gaviota Avenue is expected to be negligible.

Should you have any questions or if we can be of further assistance, please do not hesitate to call at (714) 973-8383.

Respectfully,

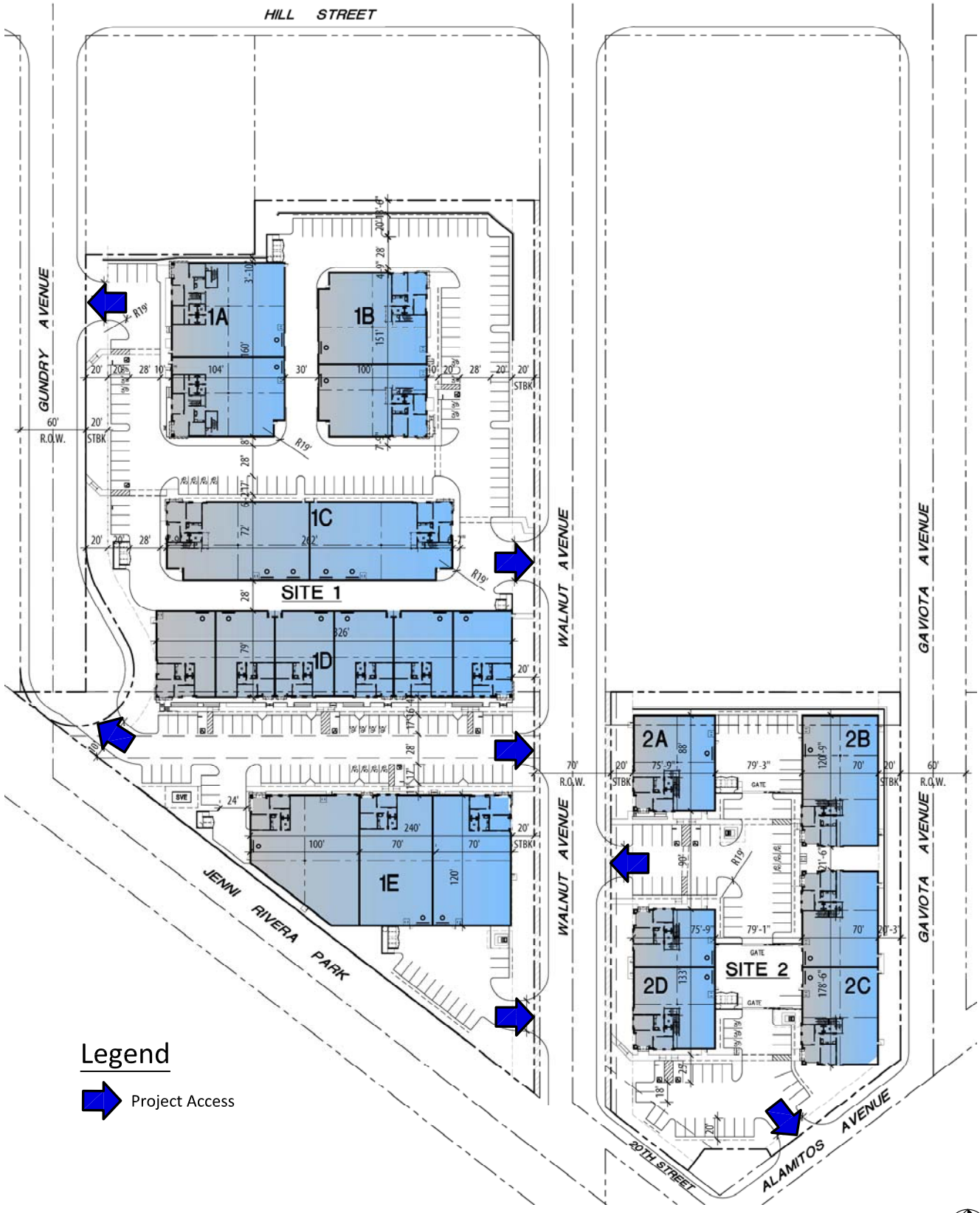
KUNZMAN ASSOCIATES, INC.



Giancarlo Ganddini, TE, PTP
Manager of Traffic Engineering

JN 7311

Figure 1
Site Plan & Access Points



Source: GAA Architects

Figure 2
Project Trip Distribution - Passenger Cars (Outbound)

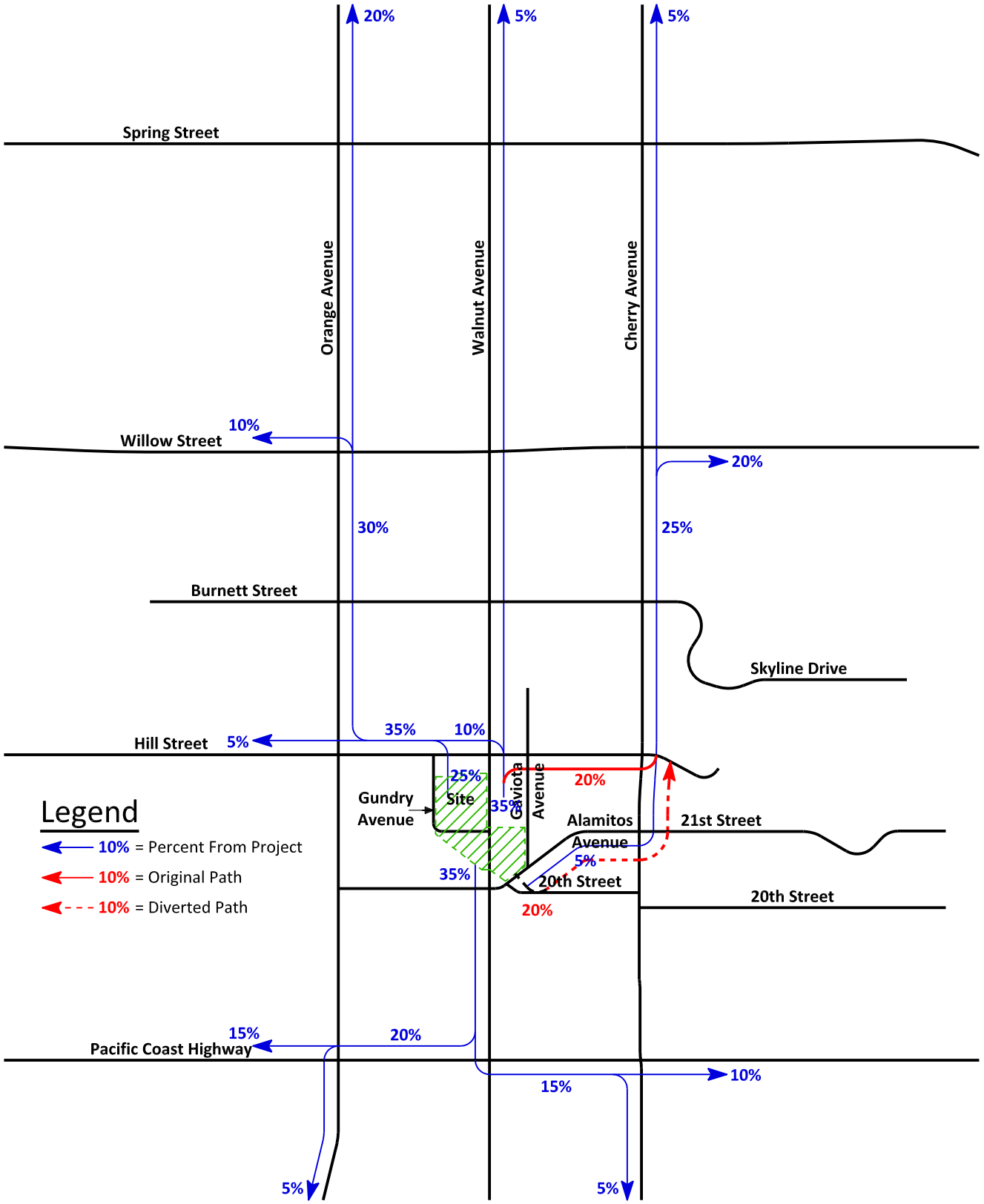


Figure 3
Project Trip Distribution - Passenger Cars (Inbound)

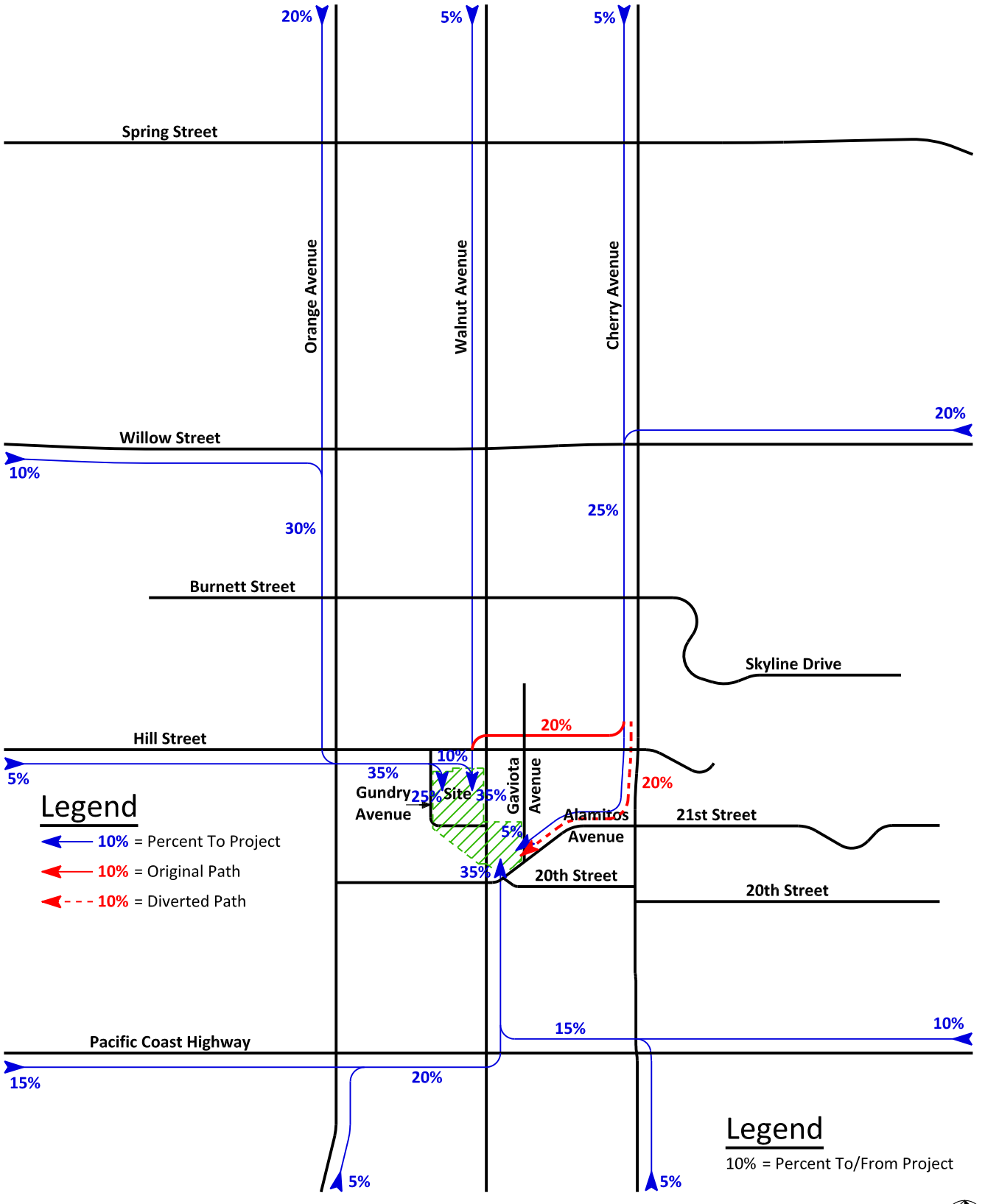


Figure 4
Project Trip Distribution - Trucks (Outbound)

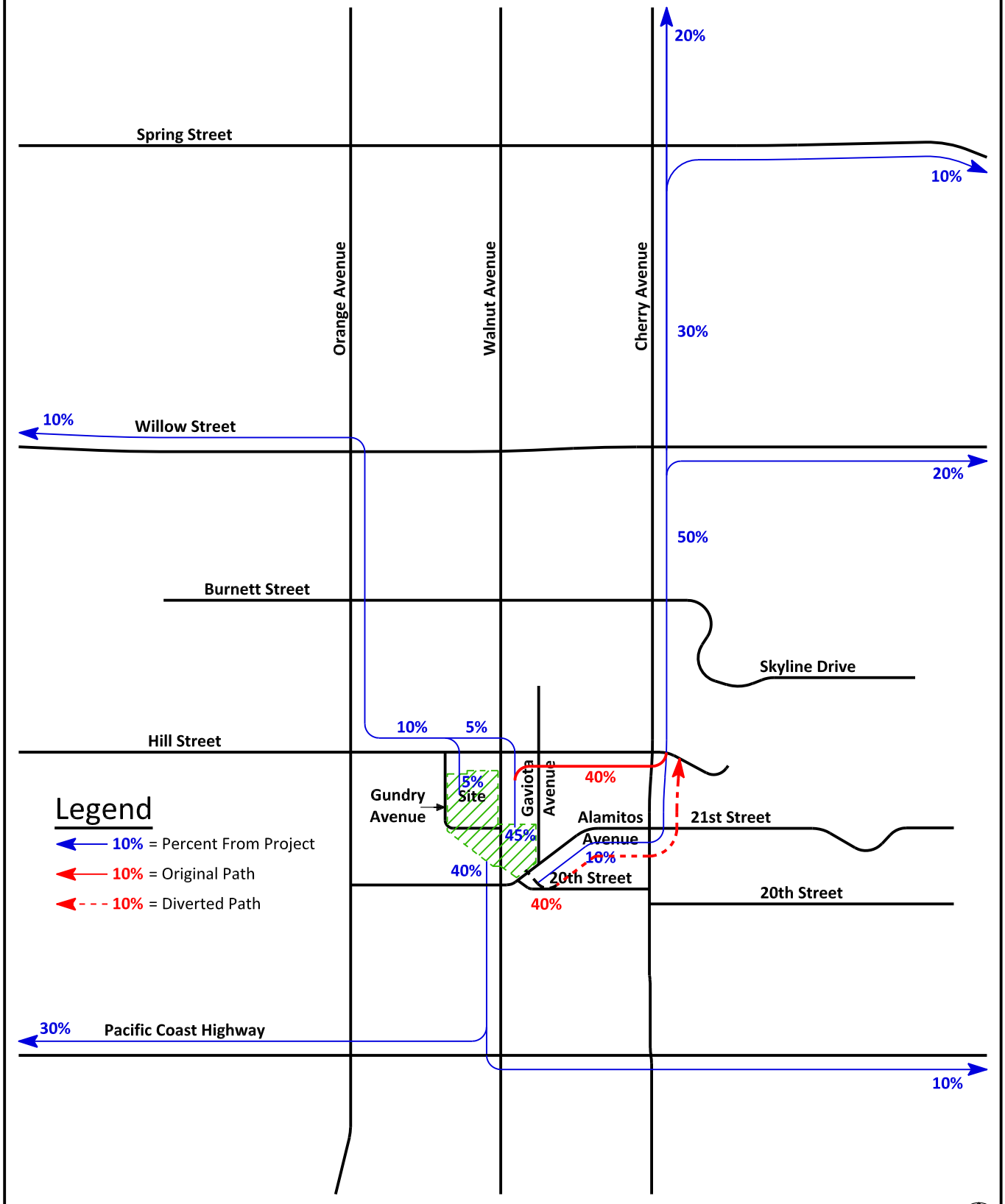
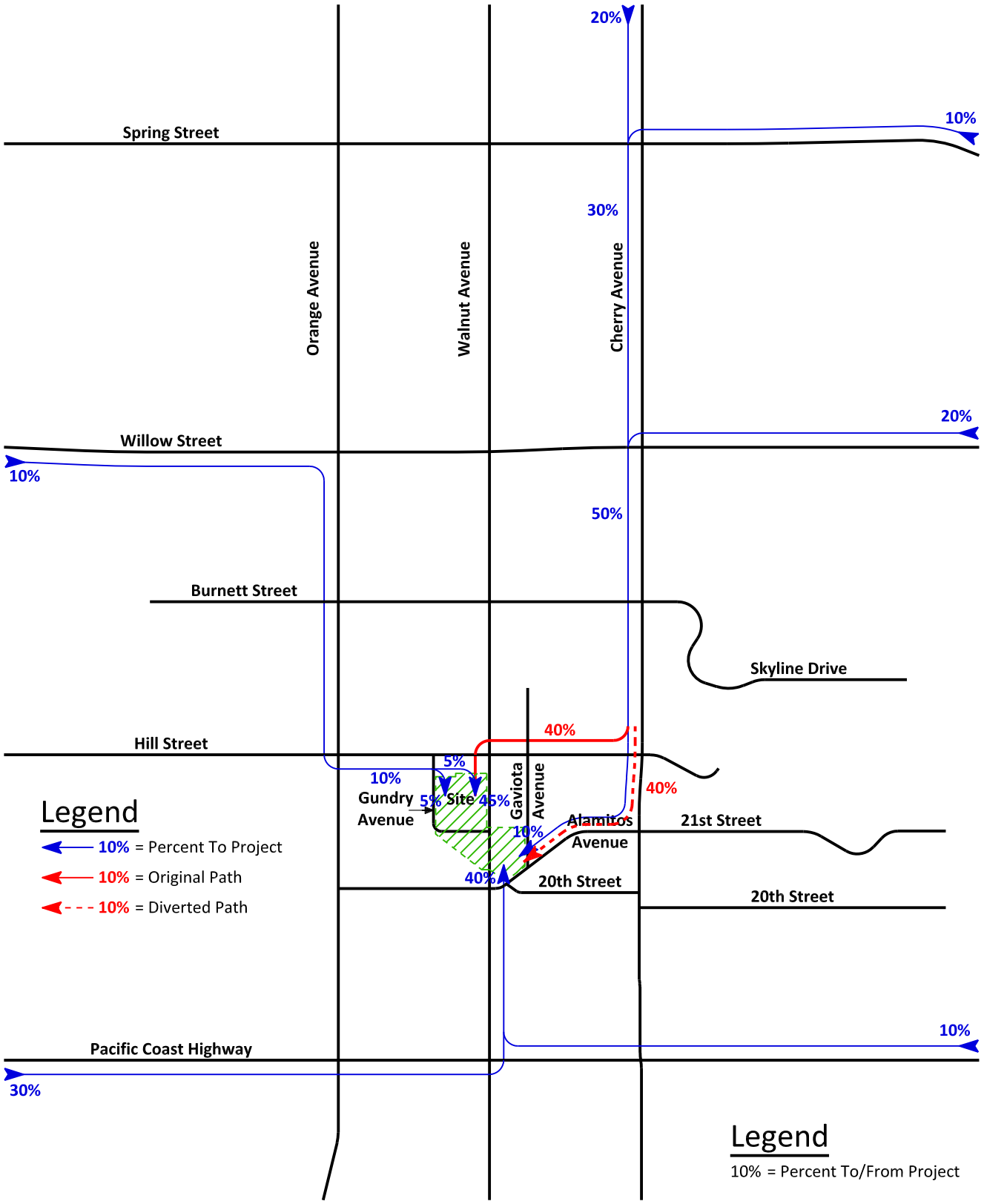


Figure 5
Project Trip Distribution - Trucks (Inbound)



Your Trusted Advisors for
Transportation & Environmental Analysis

September 21, 2018

Mr. Steven Christie, Development Manager
SIGNAL HILL XC, LLC
3010 Old Ranch Parkway, Suite 470
Seal Beach, CA 90740

RE: Signal Hill Business Center Supplemental Traffic Analysis
18-0056

Mr. Steven Christie:

INTRODUCTION

Ganddini Group is pleased to submit this Supplemental Traffic Analysis for the Signal Hill Business Center project. The purpose of this Supplemental Traffic Analysis is to evaluate the potential for additional project traffic impacts based on two additional thresholds not included in the Signal Hill Business Center Traffic Impact Analysis.

This traffic analysis supplements the Signal Hill Business Center Traffic Impact Analysis (Kunzman Associates, Inc., Revised June 22, 2018) ["Project Traffic Impact Analysis"] and the Supplemental Afternoon School Peak Hour Analysis (Kunzman Associates, Inc, May 31, 2018). The project site is generally bounded by Gundry Avenue to the west, Gundry Hill Apartments and American University of Health Sciences to the north, Gaviota Avenue to the east, and the Signal Hill City Limits and Alamitos Avenue to the south. The project site is currently vacant. The proposed project involves developing the project site with a business park consisting of nine buildings totaling 139,080 square feet plus 12,000 square feet of mezzanine, for a total of 151,080 square feet of gross floor area. Full access driveways are proposed at Gundry Avenue, Walnut Avenue, and Alamitos Avenue. The proposed project is anticipated to be constructed and fully operational by Year 2019.

Although this is a technical report, effort has been made to write the report clearly and concisely. To assist the reader with technical terms related to transportation engineering, a glossary is provided in Appendix A.

THRESHOLDS OF SIGNIFICANCE

Per City of Signal Hill traffic study criteria, the intersection mitigation requirement should include (all) following elements:

- Drop of 0.02 (2%) in LOS (ICU); or
- 40 vehicles added to an intersection; or
- Left-turn queue length is greater than the existing storage length.

As requested by City of Signal Hill staff, this Supplemental Traffic Analysis will address the second and third elements (40 vehicles added to an intersection and left-turn queue exceeds existing storage length).

ELEMENT 2 – 40 VEHICLES ADDED TO A STUDY INTERSECTION

Table 1 summarizes the number of project-generated trips forecast to be added at each study intersection within City of Signal Hill jurisdiction during the morning, school afternoon, and evening peak hours. Non-City of Signal Hill intersections are omitted since this threshold only applies to City of Signal Hill. The proposed project is forecast to contribute 40 or more peak hour trips at the following study intersections:

Orange Avenue (NS) at Willow Street (EW) - #2
This signalized intersection is forecast to operate at Level of Service F during the evening peak hour for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

Orange Avenue (NS) at Burnett Street (EW) - #3
This signalized intersection is forecast to operate at Level of Service C during the peak hours for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

Orange Avenue (NS) at Hill Street (EW) - #4
This signalized intersection is forecast to operate at Level of Service D or better during the peak hours for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

Gundry Avenue (NS) at Hill Street (EW) - #6
This unsignalized intersection is forecast to operate at Level of Service C or better during the peak hours for General Plan Buildout Without and With Project conditions. A traffic signal is not forecast to be warranted based on the peak hour volume traffic signal warrant (see Appendix B.)

Proposed Mitigation: N/A

Walnut Avenue (NS) at Hill Street (EW) - #10
This unsignalized intersection is forecast to operate at Level of Service C during the morning/evening peak hours and Level of Service E during the school afternoon peak hour only; however, a traffic signal is not forecast to be warranted (see Appendix B). As previously noted in the Supplemental Afternoon School Peak Hour Analysis (Kunzman Associates, Inc, May 31, 2018), extending the parking restriction on the northbound approach would effectively allow for operation of a right turn lane.

Proposed Mitigation: Extend the no parking restriction on the northbound approach to 100 feet south of the intersection. This will result in the loss of approximately two on-street parking spaces, but will allow for a de facto right turn lane.

Gaviota Avenue (NS) at Hill Street (EW) - #13
This unsignalized intersection is forecast to operate at Level of Service B during the peak hours for General Plan Buildout Without and With Project conditions A traffic signal is not forecast to be warranted based on the peak hour volume traffic signal warrant (see Appendix B.)

Proposed Mitigation: N/A

Cherry Avenue (NS) at Willow Street (EW) - #15
This signalized intersection is forecast to operate at Level of Service F during the evening peak hour for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

Cherry Avenue (NS) at Burnett Street (EW) - #16
This signalized intersection is forecast to operate at Level of Service C during the peak hours for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

Cherry Avenue (NS) at Hill Street (EW) - #17
This signalized intersection is forecast to operate at Level of Service C during the peak hours for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

ELEMENT 3 – LEFT-TURN QUEUE EXCEEDS STORAGE LENGTH

Table 2 summarizes the existing left-turn storage lengths and the corresponding queue length during the morning, school afternoon (where applicable), and evening peak hours for study intersections within City of Signal Hill jurisdiction where the project is forecast to add trips to the left turn movement. Non-City of Signal Hill intersections are omitted since this threshold only applies to City of Signal Hill. The queue length was calculated in accordance with the Highway Capacity Manual, 6th Edition back of queue methodology for the 95th-percentile queue length. Queue worksheets are provided in Appendix C.

As shown in Table 2, adequate left-turn storage is forecast to be provided at the City of Signal Hill study intersections where the proposed project is forecast to increase the left-turn volume during the peak hours for Opening Year (2020) With Project conditions.

As also shown in Table 2, adequate left-turn storage is forecast to be provided at the City of Signal Hill study intersections where the proposed project is forecast to increase the left-turn volume during the peak hours for General Plan Buildout (Year 2040) With Project conditions, with exception of the southbound left turn at Orange Avenue/Hill Street and the westbound left turn at Cherry Avenue/Willow Street.

Orange Avenue (NS) at Hill Street (EW) - #4
Southbound left-turn storage length is forecast to be exceeded during the morning peak hour for General Plan Buildout (Year 2040) With Project conditions. It should be noted that there is additional storage available within the painted median to accommodate the additional queue.

Proposed Mitigation: If necessary, extend the southbound left turn lane striping to provide 250 feet of storage length (including bay taper).

Cherry Avenue (NS) at Willow Street (EW) - #15
Westbound left-turn storage length is forecast to be exceeded during the evening peak hour for General Plan Buildout (Year 2040) With Project conditions. The existing left-turn lane storage is approximately 200 feet for dual left turn lanes plus a left-turn bay taper of approximately 120 feet.

Proposed Mitigation: Modify the westbound raised median to accommodate 250 feet of storage length for dual left turn lanes plus a left-turn bay taper of approximately 120 feet.

FAIR SHARE IMPROVEMENT COSTS

Figure 3 shows a summary of project fair share percentages at each of the intersection improvement locations. Fair share percentages were determined based on the following formula:

$$\text{Project Fair Share} = \text{Improvement Cost} \times \frac{\text{Project Trips}}{\text{New Traffic}\ (\text{Future Traffic} - \text{Existing Traffic})}$$

Table 4 shows the cost estimate for off-site improvements. These cost estimates are intended for informational purposes only and do not imply any legal responsibility or formula for contributions or mitigation. As shown in Table 4, the total project share of estimated off-site improvement costs is $6,016.

SUMMARY

The proposed project should contribute towards updated signal timing at the following study intersections:

- Orange Avenue (NS) at Willow Street (EW) - #2
- Orange Avenue (NS) at Burnett Street (EW) - #3
- Orange Avenue (NS) at Hill Street (EW) - #4
- Cherry Avenue (NS) at Willow Street (EW) - #15
- Cherry Avenue (NS) at Burnett Street (EW) - #16
- Cherry Avenue (NS) at Hill Street (EW) - #17

Additionally, the project should contribute towards its share of costs for the following improvements:

Orange Avenue (NS) at Hill Street (EW) - #4
If necessary, extend the southbound left turn lane striping to provide 250 feet of storage length (including bay taper).

Mr. Steven Christie
SIGNAL HILL XC, LLC
September 21, 2018

Walnut Avenue (NS) at Hill Street (EW) - #10
Extend the no parking restriction on the northbound approach to 100 feet south of the intersection. This will result in the loss of approximately two on-street parking spaces, but will allow for a de facto right turn lane.

Cherry Avenue (NS) at Willow Street (EW) - #15
Modify the westbound raised median to accommodate 250 feet of storage length for dual left turn lanes plus a left-turn bay taper of approximately 120 feet.

CONCLUSION

We appreciate the opportunity to assist you on this project. Should you have any questions or if we can be of further assistance, please do not hesitate to call at (714) 795-3100.

Sincerely,

Giancarlo Ganddini, PE, PTP
Principal



Table 1
Project Trip Contribution

ID	Study Intersection	Jurisdiction[1]	Peak Hour Project Trips		40 or More Trips Added?
			Morning	School PM/ Evening	
1.	Orange Ave at Spring St	SH/LB	36	37	No
2.	Orange Ave at Willow St	SH/LB	60	62	Yes
3.	Orange Ave at Burnett St	SH	60	62	Yes
4.	Orange Ave at Hill St	SH/LB	69	71	Yes
6.	Gundry Ave at Hill St	SH	71	72	Yes
7.	Walnut Ave at Spring St	SH/LB	9	9	No
8.	Walnut Ave at Willow St	SH	9	9	No
9.	Walnut Ave at Burnett St	SH	9	9	No
10.	Walnut Ave at Hill St	SH	95	93	Yes
13.	Gaviota Ave at Hill St	SH	64	62	Yes
14.	Cherry Ave at Spring St	SH/LB	28	29	No
15.	Cherry Ave at Willow St	SH	79	78	Yes
16.	Cherry Ave at Burnett St	SH	79	78	Yes
17.	Cherry Ave at Hill St	SH	79	78	Yes
18.	Cherry Ave at 21st St	SH	15	16	No
19.	Cherry Ave at 20th St	SH	0	0	No

Notes:

(1) SH = City of Signal Hill; LB = City of Long Beach

Table 2
Left-Turn Lane Queue Lengths

ID	Study Intersection	Movement[1]	Storage Length[2]	Opening Year (2020) With Project			
				95th-Percentile Queue Length (Feet)			Adequate Storage Length?
				Morning	School PM	Evening	
2.	Orange Ave at Willow St	NBL	145+	46	n/a	47	Yes
4.	Orange Ave at Hill St	SBL	225+	219	84	86	Yes
14.	Cherry Ave at Spring St	WBL	215+	138	n/a	120	Yes
15.	Cherry Ave at Willow St	WBL	225	167	n/a	201	Yes

ID	Study Intersection	Movement[1]	Storage Length[2]	General Plan Buildout (Year 2040) With Project			
				95th-Percentile Queue Length (Feet)			Adequate Storage Length?
				Morning	School PM	Evening	
2.	Orange Ave at Willow St	NBL	145+	66	n/a	59	Yes
4.	Orange Ave at Hill St	SBL	225+	240	98	104	No
14.	Cherry Ave at Spring St	WBL	215+	162	n/a	140	Yes
15.	Cherry Ave at Willow St	WBL	225	195	n/a	276	No

Table 3
Project Fair Share Percentage

ID	Study Intersection	Peak Hour	Existing Volume	General Plan Buildout Volume	Total New Volume	Project Trips	Project % of New Traffic
2.	Orange Ave at Willow St	Morning	3,574	4,507	933	60	6.4%
		Evening	4,159	5,235	1,076	62	5.8%
3.	Orange Ave at Burnett St	Morning	1,537	1,999	462	60	13.0%
		Evening	1,521	1,988	467	62	13.3%
4.	Orange Ave at Hill St	Morning	1,742	2,260	518	69	13.3%
		School PM	1,683	2,195	512	71	13.9%
		Evening	1,641	2,142	501	71	14.2%
10.	Walnut Ave at Hill St	Morning	805	1,098	293	95	32.4%
		School PM	951	1,269	318	93	29.2%
		Evening	859	1,156	297	93	31.3%
15.	Cherry Ave at Willow St	Morning	4,989	6,283	1,294	79	6.1%
		Evening	5,804	7,286	1,482	78	5.3%
16.	Cherry Ave at Burnett St	Morning	2,609	3,311	702	79	11.3%
		Evening	2,852	3,611	759	78	10.3%
17.	Cherry Ave at Hill St	Morning	2,388	3,042	654	79	12.1%
		Evening	2,600	3,302	702	78	11.1%

Table 4
Cost Estimate and Project Fair Share

ID	Study Intersection	Improvement	Cost Estimate	Project % of New Traffic[1]	Project Fair Share of Cost
2.	Orange Ave at Willow St	- Update signal timing[2]	$ 5,000	6.4%	$ 322
3.	Orange Ave at Burnett St	- Update signal timing	$ 5,000	13.3%	$ 664
4.	Orange Ave at Hill St	- Update signal timing - Extend the southbound left turn lane striping to provide 250 feet of storage length (including bay taper).[3]	$ 5,000 $ 3,750	14.2%	$ 1,240
10.	Walnut Ave at Hill St	- Extend the no parking restriction on the northbound approach to 100 feet south of the intersection. This will result in the loss of approximately two on-street parking spaces, but will allow for a de facto right turn lane.	$ 1,500	32.4%	$ 486
15.	Cherry Ave at Willow St	- Update signal timing - Modify the westbound raised median to accommodate 250 feet of storage length for dual left turn lanes plus a left-turn bay taper of approximately 120 feet.[4]	$ 5,000 $ 30,000	6.1%	$ 2,137
16.	Cherry Ave at Burnett St	- Update signal timing	$ 5,000	11.3%	$ 563
17.	Cherry Ave at Hill St	- Update signal timing	$ 5,000	12.1%	$ 604
TOTAL			$ 65,250		$ 6,016

Notes:

(1) Based on greater of morning, school afternoon, or evening peak hour share from Table 3.

(2) Source: National Traffic Signal Report Card: Technical Report 2005, National Transportation Operations Coalition (http://www.ite.org/reportcard/NTS_TechReport.pdf)

(3) Cost to remove and add striping is estimated at $15 per linear foot.

(4) https://safety.fhwa.dot.gov/saferjourney1/Library/countermeasures/16.htm

APPENDIX A

GLOSSARY

GLOSSARY OF TERMS

ACRONYMS

AC	Acres
ADT	Average Daily Traffic
Caltrans	California Department of Transportation
DU	Dwelling Unit
ICU	Intersection Capacity Utilization
LOS	Level of Service
TSF	Thousand Square Feet
V/C	Volume/Capacity
VMT	Vehicle Miles Traveled

TERMS

AVERAGE DAILY TRAFFIC: The average 24-hour volume for a stated period divided by the number of days in that period. For example, Annual Average Daily Traffic is the total volume during a year divided by 365 days.

BANDWIDTH: The number of seconds of green time available for through traffic in a signal progression.

BOTTLENECK: A point of constriction along a roadway that limits the amount of traffic that can proceed downstream from its location.

CAPACITY: The maximum number of vehicles that can be reasonably expected to pass over a given section of a lane or a roadway in a given time period.

CHANNELIZATION: The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movements of both vehicles and pedestrians.

CLEARANCE INTERVAL: Nearly same as yellow time. If there is an all red interval after the end of a yellow, then that is also added into the clearance interval.

CONTROL DELAY: The component of delay, typically expressed in seconds per vehicle, resulting from the type of traffic control at an intersection. Control delay is measured by comparison with the uncontrolled condition; it includes delay incurred by slowing down, stopping/waiting, and speeding up.

CORDON: An imaginary line around an area across which vehicles, persons, or other items are counted (in and out).

CORNER SIGHT DISTANCE: The minimum sight distance required by the driver of a vehicle to cross or enter the lanes of the major roadway without requiring approaching traffic travelling at a given speed to radically alter their speed or trajectory. Corner sight distance is measured from the driver's eye at 42 inches above the pavement to an object height of 36 inches above the pavement in the center of the nearest approach lane.

CYCLE LENGTH: The time period in seconds required for a traffic signal to complete one full cycle of indications.

CUL-DE-SAC: A local street open at one end only and with special provisions for turning around.

DAILY CAPACITY: A theoretical value representing the daily traffic volume that will typically result in a peak hour volume equal to the capacity of the roadway.

DELAY: The time consumed while traffic is impeded in its movement by some element over which it has no control, usually expressed in seconds per vehicle.

DEMAND RESPONSIVE SIGNAL: Same as traffic-actuated signal.

DENSITY: The number of vehicles occupying in a unit length of the through traffic lanes of a roadway at any given instant. Usually expressed in vehicles per mile.

DETECTOR: A device that responds to a physical stimulus and transmits a resulting impulse to the signal controller.

DESIGN SPEED: A speed selected for purposes of design. Features of a highway, such as curvature, superelevation, and sight distance (upon which the safe operation of vehicles is dependent) are correlated to design speed.

DIRECTIONAL SPLIT: The percent of traffic in the peak direction at any point in time.

DIVERSION: The rerouting of peak hour traffic to avoid congestion.

FORCED FLOW: Opposite of free flow.

FREE FLOW: Volumes are well below capacity. Vehicles can maneuver freely and travel is unimpeded by other traffic.

GAP: Time or distance between successive vehicles in a traffic stream, rear bumper to front bumper.

HEADWAY: Time or distance spacing between successive vehicles in a traffic stream, front bumper to front bumper.

INTERCONNECTED SIGNAL SYSTEM: A number of intersections that are connected to achieve signal progression.

LEVEL OF SERVICE: A qualitative measure of a number of factors, which include speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs.

LOOP DETECTOR: A vehicle detector consisting of a loop of wire embedded in the roadway, energized by alternating current and producing an output circuit closure when passed over by a vehicle.

MINIMUM ACCEPTABLE GAP: Smallest time headway between successive vehicles in a traffic stream into which another vehicle is willing and able to cross or merge.

MULTI-MODAL: More than one mode; such as automobile, bus transit, rail rapid transit, and bicycle transportation modes.

OFFSET: The time interval in seconds between the beginning of green at one intersection and the beginning of green at an adjacent intersection.

PLATOON: A closely grouped component of traffic that is composed of several vehicles moving, or standing ready to move, with clear spaces ahead and behind.

PASSENGER CAR EQUIVALENT (PCE): A metric used to assess the impact of larger vehicles, such as trucks, recreational vehicles, and buses, by converting the traffic volume of larger vehicles to an equivalent number of passenger cars.

PEAK HOUR: The 60 consecutive minutes with the highest number of vehicles.

PRETIMED SIGNAL: A type of traffic signal that directs traffic to stop and go on a predetermined time schedule without regard to traffic conditions. Also, fixed time signal.

PROGRESSION: A term used to describe the progressive movement of traffic through several signalized intersections.

QUEUE: The number of vehicles waiting at a service area such as a traffic signal, stop sign, or access gate.

QUEUE LENGTH: The length of vehicle queue, typically expressed in feet, waiting at a service area such as a traffic signal, stop sign, or access gate.

SCREEN-LINE: An imaginary line or physical feature across which all trips are counted, normally to verify the validity of mathematical traffic models.

SHARED/RECIPROCAL PARKING AGREEMENT: A written binding document executed between property owners to provide a designated number of off-street parking stalls within a designated area to be available for specified businesses or land uses.

SIGHT DISTANCE: The continuous length of roadway visible to a driver or roadway user.

SIGNAL CYCLE: The time period in seconds required for one complete sequence of signal indications.

SIGNAL PHASE: The part of the signal cycle allocated to one or more traffic movements.

STACKING DISTANCE: The length of area available behind a service area, such as a traffic signal or gate, for vehicle queueing to occur.

STARTING DELAY: The delay experienced in initiating the movement of queued traffic from a stop to an average running speed through an intersection.

STOPPING SIGHT DISTANCE: The minimum distance required by the driver of a vehicle on the major roadway travelling at a given speed to bring the vehicle to a stop after an object on the road becomes visible. Stopping sight distance is measured from the driver's eye at 42 inches above the pavement to an object height of 6 inches above the pavement.

TRAFFIC-ACTUATED SIGNAL: A type of traffic signal that directs traffic to stop and go in accordance with the demands of traffic, as registered by the actuation of detectors.

TRIP: The movement of a person or vehicle from one location (origin) to another (destination). For example, from home to store to home is two trips, not one.

TRIP-END: One end of a trip at either the origin or destination (i.e., each trip has two trip-ends). A trip-end occurs when a person, object, or message is transferred to or from a vehicle.

TRIP GENERATION RATE: The quantity of trips produced and/or attracted by a specific land use stated in terms of units such as per dwelling, per acre, and per 1,000 square feet of floor space.

TRUCK: A vehicle having dual tires on one or more axles, or having more than two axles.

TURNING RADIUS: The circular arc formed by the smallest turning path radius of the front outside tire of a vehicle, such as that performed by a U-turn maneuver. This is based on the length and width of the wheel base as well as the steering mechanism of the vehicle.

UNBALANCED FLOW: Heavier traffic flow in one direction than the other. On a daily basis, most facilities have balanced flow. During the peak hours, flow is seldom balanced in an urban area.

VEHICLE MILES OF TRAVEL: A measure of the amount of usage of a section of highway, obtained by multiplying the average daily traffic by length of facility in miles.

APPENDIX B

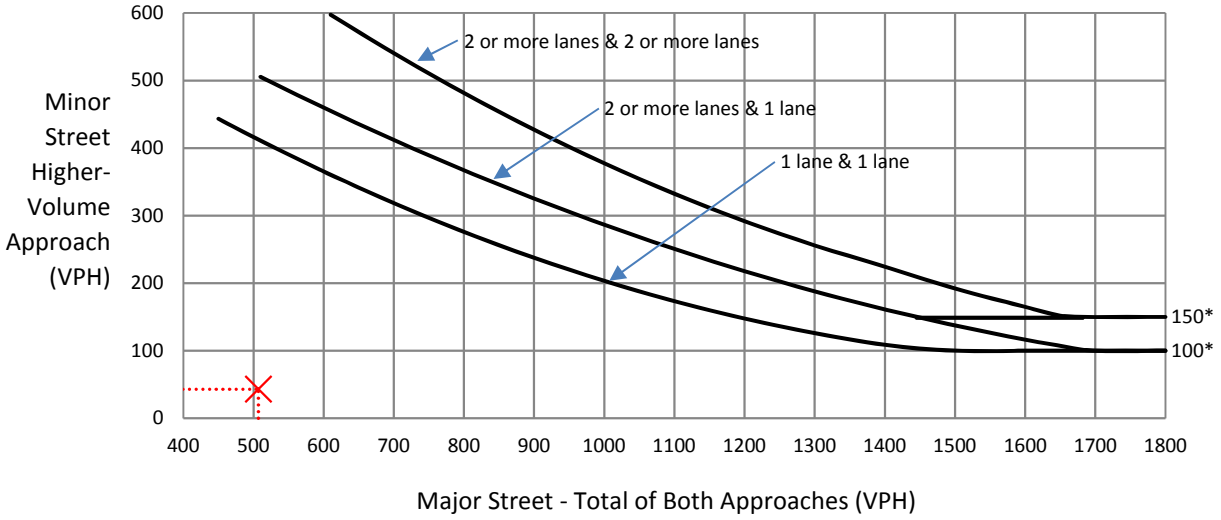
TRAFFIC SIGNAL WARRANT WORKSHEETS

Figure C-1

Gundry Ave (NS) / Hill St (EW) - #6
General Plan Buildout With Project
AM Peak Hour

Major Street:	Hill St	Volume:	507
Minor Street:	Gundry Ave	Volume:	43

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

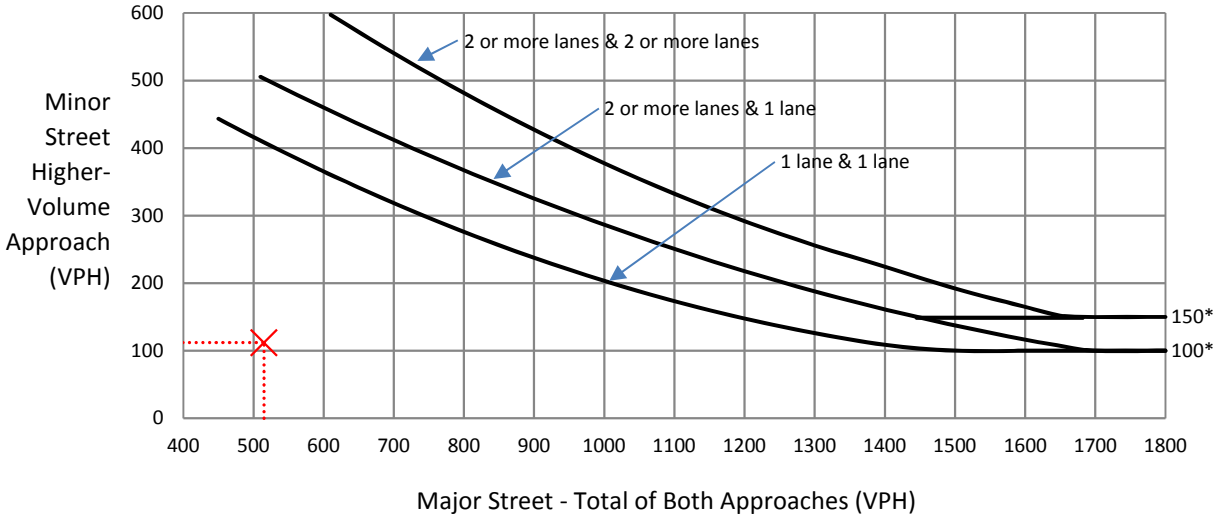
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-2

Gundry Ave (NS) / Hill St (EW) - #6
General Plan Buildout With Project
School PM Peak Hour

Major Street:	Hill St	Volume:	515
Minor Street:	Gundry Ave	Volume:	112

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

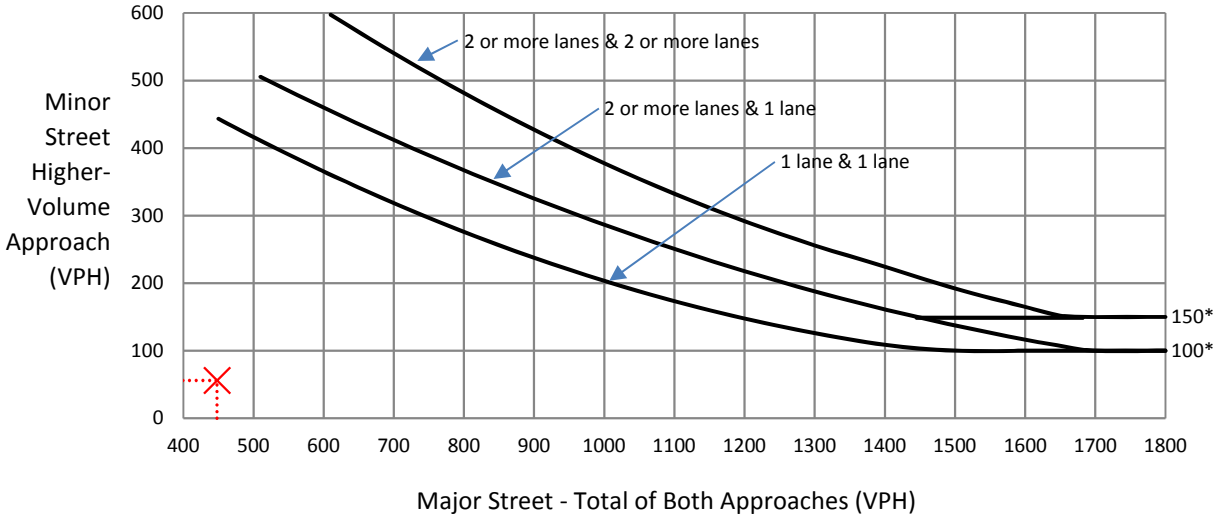
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-3

Gundry Ave (NS) / Hill St (EW) - #6
General Plan Buildout With Project
PM Peak Hour

Major Street:	Hill St	Volume:	448
Minor Street:	Gundry Ave	Volume:	56

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

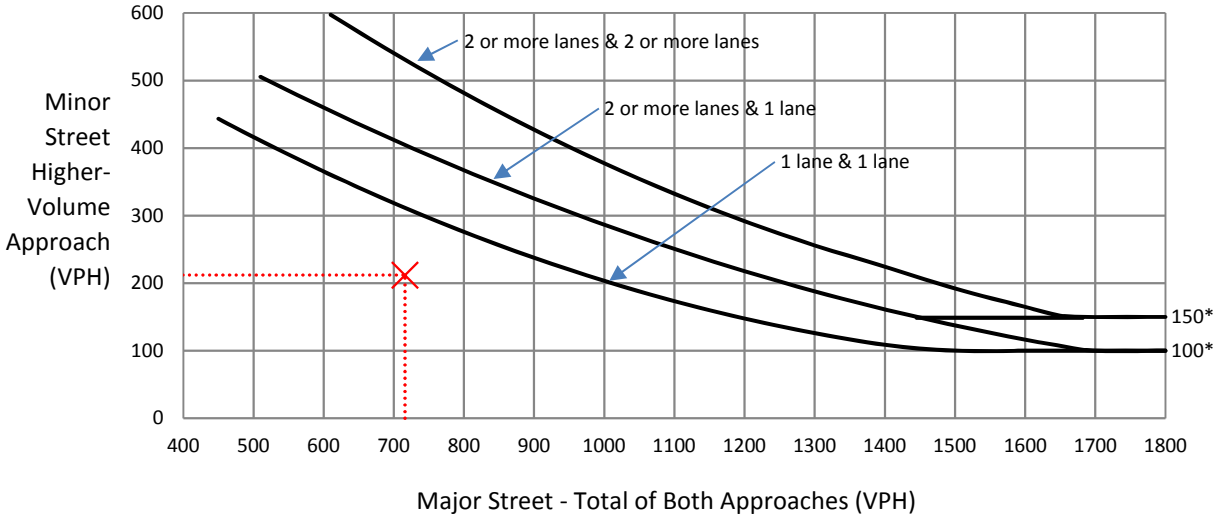
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-4

Walnut Ave (NS) / Hill St (EW) - #10
General Plan Buildout With Project
AM Peak Hour

Major Street:	Walnut Ave	Volume:	716
Minor Street:	Hill St	Volume:	212

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

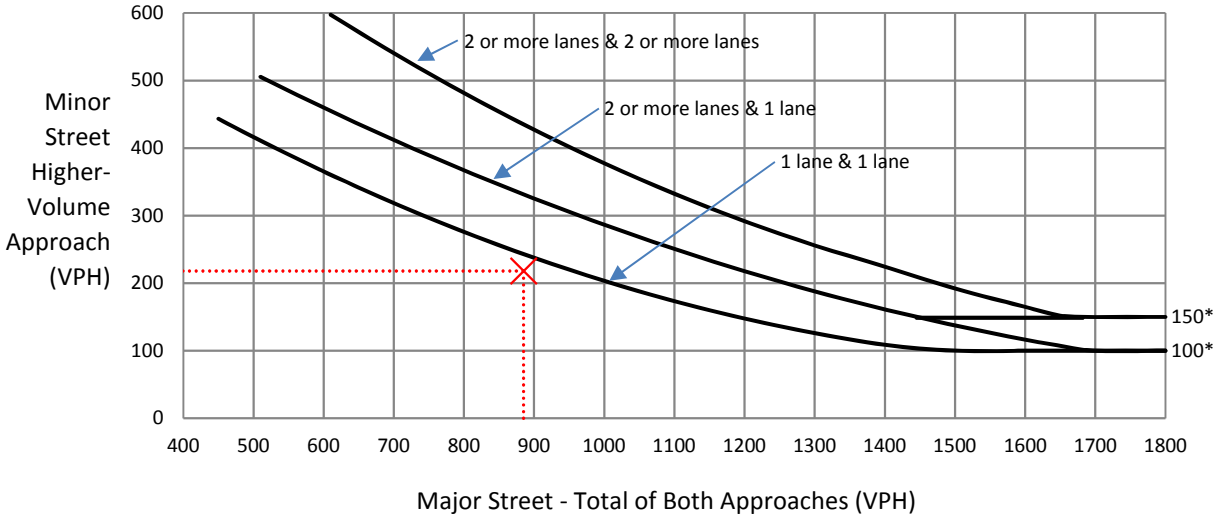
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-5

Walnut Ave (NS) / Hill St (EW) - #10
General Plan Buildout With Project
School PM Peak Hour

Major Street:	Walnut Ave	Volume:	885
Minor Street:	Hill St	Volume:	218

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

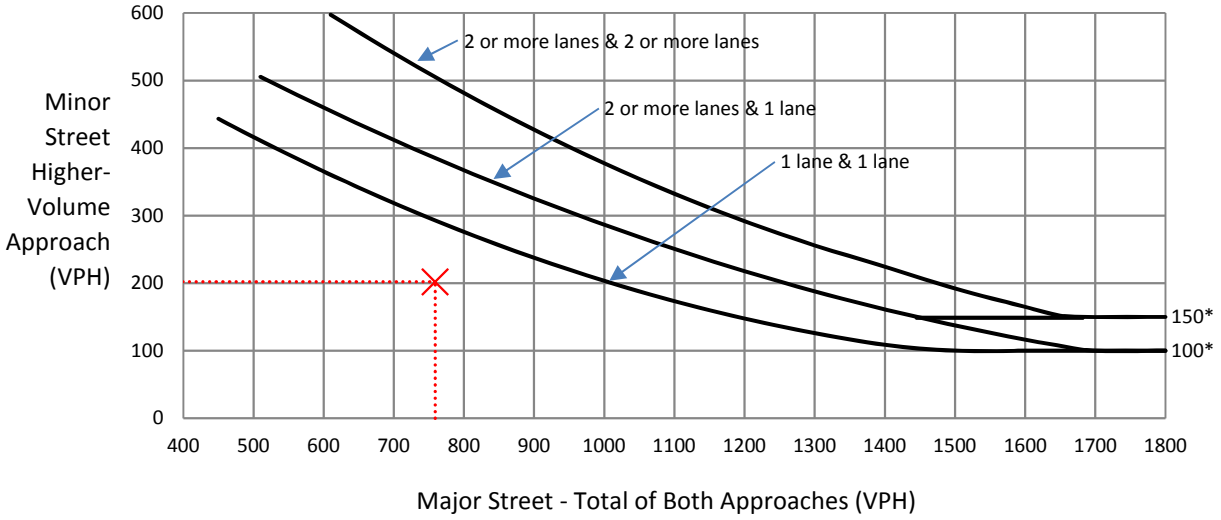
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-6

Walnut Ave (NS) / Hill St (EW) - #10
General Plan Buildout With Project
PM Peak Hour

Major Street:	Walnut Ave	Volume:	759
Minor Street:	Hill St	Volume:	202

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

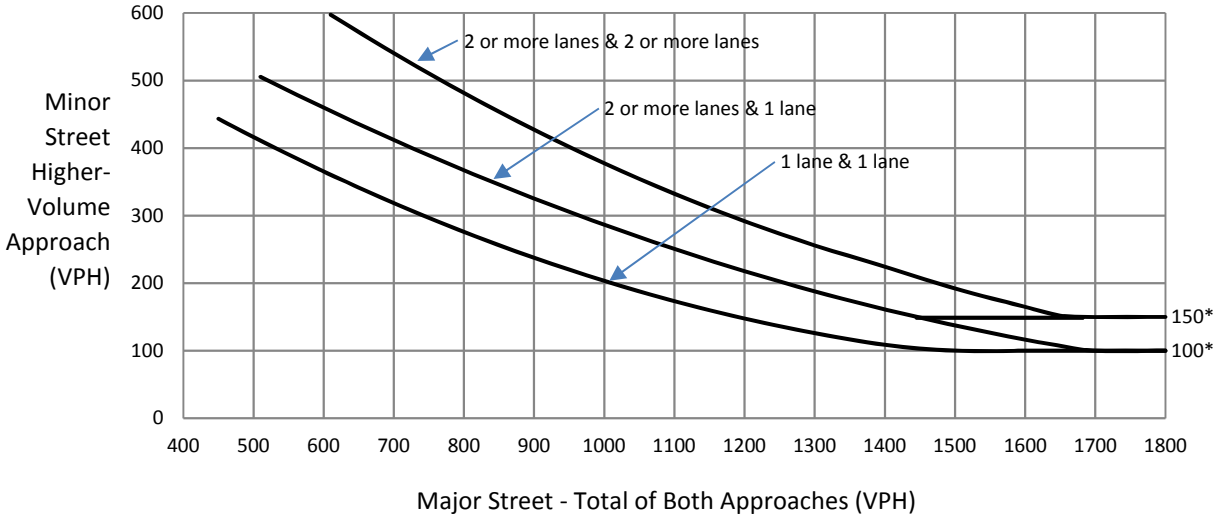
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-7

Gaviota Ave (NS) / Hill St (EW) - #13
General Plan Buildout With Project
AM Peak Hour

Major Street:	Hill St	Volume:	374
Minor Street:	Gaviota Ave	Volume:	45

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

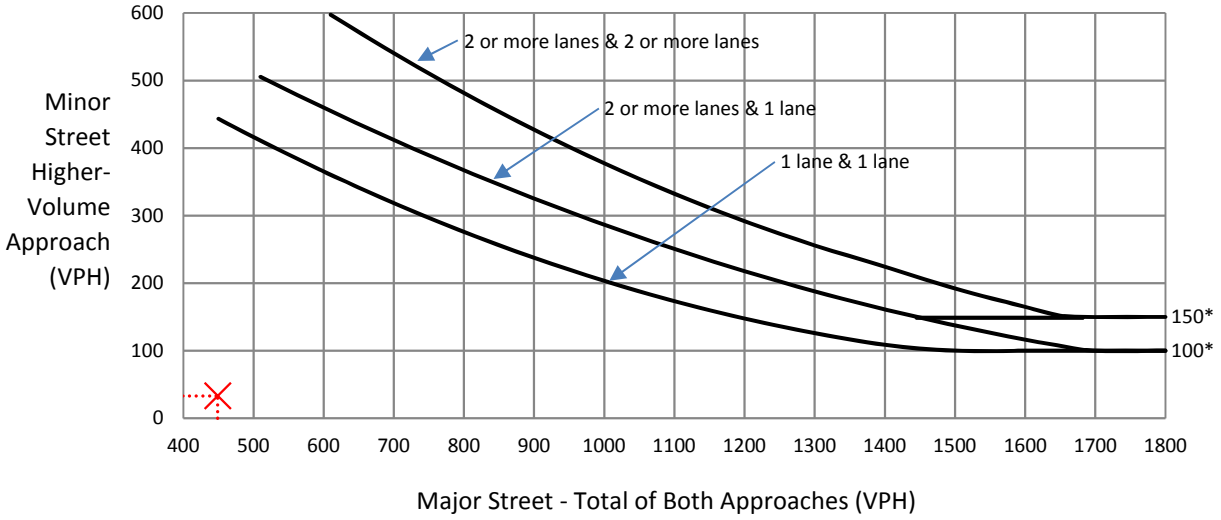
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-8

Gaviota Ave (NS) / Hill St (EW) - #13
General Plan Buildout With Project
PM Peak Hour

Major Street:	Hill St	Volume:	449
Minor Street:	Gaviota Ave	Volume:	33

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

APPENDIX C

HCM QUEUE LENGTH WORKSHEETS

Opening Year (2020) With Project

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	32.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.625

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	82	492	92	40	439	83	84	931	72	69	1128	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	12	0	8	36	2	4	30	21	0	16	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	514	94	49	484	87	90	980	94	70	1167	76
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	129	24	12	121	22	23	245	24	18	292	19
Total Analysis Volume [veh/h]	89	514	94	49	484	87	90	980	94	70	1167	76
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	31	0	11	31	0	31	46	0	12	27	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	55	45	55	44	44	7	27	27	6	27	27
g / C, Green / Cycle	0.55	0.45	0.55	0.44	0.44	0.07	0.27	0.27	0.06	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.08	0.27	0.05	0.25	0.05	0.05	0.20	0.20	0.04	0.23	0.23
s, saturation flow rate [veh/h]	1064	1900	1023	1900	1615	1810	3618	1816	1810	3618	1841
c, Capacity [veh/h]	502	858	473	836	710	119	993	498	110	975	496
d1, Uniform Delay [s]	13.14	20.64	13.07	21.08	16.61	45.99	32.85	32.87	45.92	34.58	34.59
k, delay calibration	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.77	3.08	0.09	2.92	0.35	9.35	1.00	1.99	5.89	2.10	4.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.18	0.60	0.10	0.58	0.12	0.76	0.72	0.72	0.63	0.84	0.84
d, Delay for Lane Group [s/veh]	13.91	23.72	13.17	24.01	16.96	55.34	33.85	34.86	51.81	36.69	38.71
Lane Group LOS	B	C	B	C	B	E	C	C	D	D	D
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.02	9.42	0.50	8.90	1.23	2.50	7.84	8.03	1.87	9.58	10.03
50th-Percentile Queue Length [ft/ln]	25.50	235.41	12.59	222.39	30.83	62.42	195.98	200.64	46.81	239.46	250.80
95th-Percentile Queue Length [veh/ln]	1.84	14.45	0.91	13.79	2.22	4.49	12.43	12.67	3.37	14.65	15.23
95th-Percentile Queue Length [ft/ln]	45.90	361.22	22.65	344.68	55.50	112.36	310.78	316.79	84.25	366.35	380.67

Movement, Approach, & Intersection Results

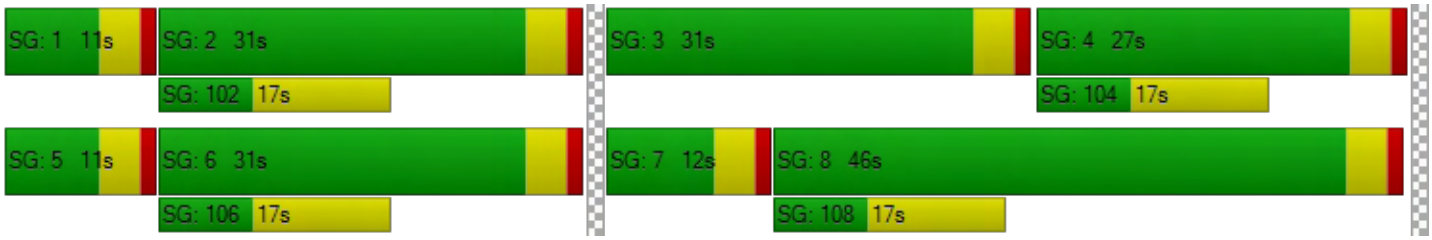
d_M, Delay for Movement [s/veh]	13.91	23.72	0.00	13.17	24.01	16.96	55.34	34.13	34.86	51.81	37.28	38.71
Movement LOS	B	C		B	C	B	E	C	C	D	D	D
d_A, Approach Delay [s/veh]	22.27			22.16			35.83			38.14		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	32.15											
Intersection LOS	C											
Intersection V/C	0.625											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.549	2.558	3.006	2.958
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	540	540	840	460
d_b, Bicycle Delay [s]	26.65	26.65	16.82	29.65
l_b,int, Bicycle LOS Score for Intersection	2.555	2.583	2.200	2.282
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	341.3
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	3.755

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	40	667	22	28	526	25	78	90	38	47	124	57
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	3	54	19	9	6	9	0	4	2	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	41	695	25	83	556	35	86	101	39	52	128	71
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	174	6	21	139	9	22	25	10	13	32	18
Total Analysis Volume [veh/h]	41	695	25	83	556	35	86	101	39	52	128	71
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	24	0	0	24	0	0	76	0	0	76	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	20	20	20	20	72	72	72	72
g / C, Green / Cycle	0.20	0.20	0.20	0.20	0.72	0.72	0.72	0.72
(v / s)_i Volume / Saturation Flow Rate	0.05	0.38	0.11	0.31	3.00	0.02	1.38	0.04
s, saturation flow rate [veh/h]	839	1888	744	1880	62	1615	130	1615
c, Capacity [veh/h]	72	381	72	379	97	1160	140	1160
d1, Uniform Delay [s]	50.00	39.92	50.00	39.92	32.94	4.06	37.36	4.15
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	28.63	410.77	153.09	264.12	449.81	0.01	171.35	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.57	1.89	1.15	1.56	1.92	0.03	1.28	0.06
d, Delay for Lane Group [s/veh]	78.63	450.69	203.09	304.04	482.74	4.08	208.71	4.17
Lane Group LOS	E	F	F	F	F	A	F	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	1.59	52.65	4.86	36.99	13.11	0.20	8.83	0.37
50th-Percentile Queue Length [ft/ln]	39.86	1316.37	121.42	924.65	327.80	5.01	220.86	9.30
95th-Percentile Queue Length [veh/ln]	2.87	81.97	8.74	56.86	23.60	0.36	15.90	0.67
95th-Percentile Queue Length [ft/ln]	71.75	2049.37	218.55	1421.53	590.04	9.01	397.55	16.75

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	78.63	450.69	450.69	203.09	304.04	304.04	482.74	482.74	4.08	208.71	208.71	4.17
Movement LOS	E	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	430.64			291.61			400.14			150.85		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	341.30											
Intersection LOS	F											
Intersection V/C	3.755											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.553	2.630	2.143	2.213
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	400	400	1440	1440
d_b, Bicycle Delay [s]	32.00	32.00	3.92	3.92
l_b,int, Bicycle LOS Score for Intersection	2.815	2.672	1.933	1.974
Bicycle LOS	C	B	A	A

Sequence

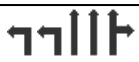
Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	33.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.685

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	86	1069	170	281	1098	137	120	544	75	105	1052	358
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	21	1	0	46	0	0	1	8	5	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	90	1111	174	287	1166	140	122	556	85	112	1074	365
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	278	44	72	292	35	31	139	21	28	269	91
Total Analysis Volume [veh/h]	90	1111	174	287	1166	140	122	556	85	112	1074	365
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	23	39	0	17	33	0	13	21	0	23	31	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	39	39	13	45	45	8	24	24	8	24	24	24
g / C, Green / Cycle	0.06	0.39	0.39	0.13	0.45	0.45	0.08	0.24	0.24	0.08	0.24	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.05	0.24	0.24	0.11	0.24	0.24	0.07	0.12	0.12	0.06	0.20	0.20	0.20
s, saturation flow rate [veh/h]	1810	3618	1771	2663	3618	1798	1810	3618	1775	1810	3618	1867	1615
c, Capacity [veh/h]	118	1418	694	338	1640	815	153	875	429	144	857	442	383
d1, Uniform Delay [s]	46.02	24.30	24.30	42.79	19.71	19.71	45.00	32.65	32.71	45.22	36.57	36.57	36.57
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.21	0.21
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.56	1.95	3.94	5.98	1.24	2.48	9.15	0.43	0.89	8.69	2.58	9.02	10.29
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.76	0.61	0.61	0.85	0.53	0.53	0.80	0.49	0.50	0.78	0.86	0.86	0.86
d, Delay for Lane Group [s/veh]	55.58	26.25	28.24	48.76	20.95	22.20	54.16	33.07	33.60	53.90	39.15	45.58	46.86
Lane Group LOS	E	C	C	D	C	C	D	C	C	D	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.50	8.32	8.53	3.72	7.35	7.59	3.34	4.46	4.51	3.06	8.72	9.80	8.61
50th-Percentile Queue Length [ft/ln]	62.58	207.98	213.31	93.05	183.83	189.83	83.56	111.53	112.71	76.49	218.1	244.9	215.3
95th-Percentile Queue Length [veh/ln]	4.51	13.05	13.32	6.70	11.80	12.11	6.02	7.93	7.99	5.51	13.57	14.93	13.43
95th-Percentile Queue Length [ft/ln]	112.64	326.23	333.08	167.50	295.01	302.81	150.40	198.13	199.76	137.6	339.2	373.2	335.7

Movement, Approach, & Intersection Results

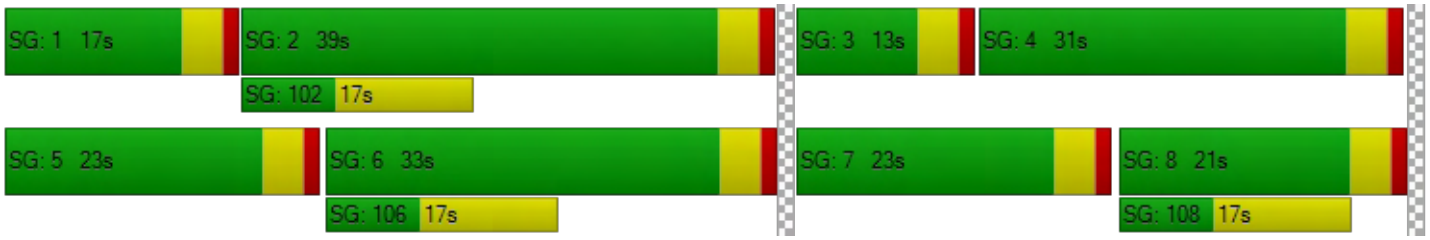
d_M, Delay for Movement [s/veh]	55.58	26.70	28.24	48.76	21.26	22.20	54.16	33.19	33.60	53.90	41.19	46.84
Movement LOS	E	C	C	D	C	C	D	C	C	D	D	D
d_A, Approach Delay [s/veh]	28.78			26.30			36.59			43.41		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	33.46											
Intersection LOS	C											
Intersection V/C	0.685											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	0.00	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.064	0.000	2.887	3.043
Crosswalk LOS	C	F	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	700	580	340	540
d_b, Bicycle Delay [s]	21.13	25.21	34.45	26.65
l_b,int, Bicycle LOS Score for Intersection	2.316	2.436	1.979	2.413
Bicycle LOS	B	B	A	B

Sequence

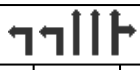
Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	35.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.643

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	167	1031	161	149	765	147	177	836	85	231	1124	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	24	28	31	0	1	28	0	51	10	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	170	1067	188	180	811	150	182	881	87	287	1156	126
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	43	267	47	45	203	38	46	220	22	72	289	32
Total Analysis Volume [veh/h]	170	1067	188	180	811	150	182	881	87	287	1156	126
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	33	41	41	13	21	0	13	29	0	17	33	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	40	57	9	37	37	9	23	23	13	27	27
g / C, Green / Cycle	0.11	0.40	0.57	0.09	0.37	0.37	0.09	0.23	0.23	0.13	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.09	0.21	0.12	0.07	0.18	0.18	0.07	0.18	0.18	0.11	0.24	0.24
s, saturation flow rate [veh/h]	1810	5176	1615	2663	3618	1752	2663	3618	1814	2663	3618	1806
c, Capacity [veh/h]	208	2077	918	231	1350	654	233	814	408	339	957	478
d1, Uniform Delay [s]	43.28	22.61	10.55	44.78	23.96	23.98	44.75	36.60	36.61	42.75	35.47	35.47
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.15	0.11	0.11	0.30
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.64	0.91	0.50	5.60	1.22	2.52	5.62	1.78	4.95	5.87	3.19	14.41
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	0.51	0.20	0.78	0.48	0.48	0.78	0.79	0.79	0.85	0.89	0.89
d, Delay for Lane Group [s/veh]	50.92	23.52	11.06	50.38	25.18	26.50	50.36	38.38	41.57	48.63	38.66	49.88
Lane Group LOS	D	C	B	D	C	C	D	D	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	4.52	6.34	2.07	2.35	5.95	6.03	2.38	7.51	7.91	3.72	10.25	11.72
50th-Percentile Queue Length [ft/ln]	112.96	158.40	51.70	58.82	148.76	150.67	59.47	187.75	197.72	92.91	256.15	293.06
95th-Percentile Queue Length [veh/ln]	8.00	10.46	3.72	4.23	9.95	10.05	4.28	12.00	12.52	6.69	15.50	17.34
95th-Percentile Queue Length [ft/ln]	200.11	261.61	93.07	105.87	248.77	251.32	107.05	300.11	313.02	167.24	387.39	433.43

Movement, Approach, & Intersection Results

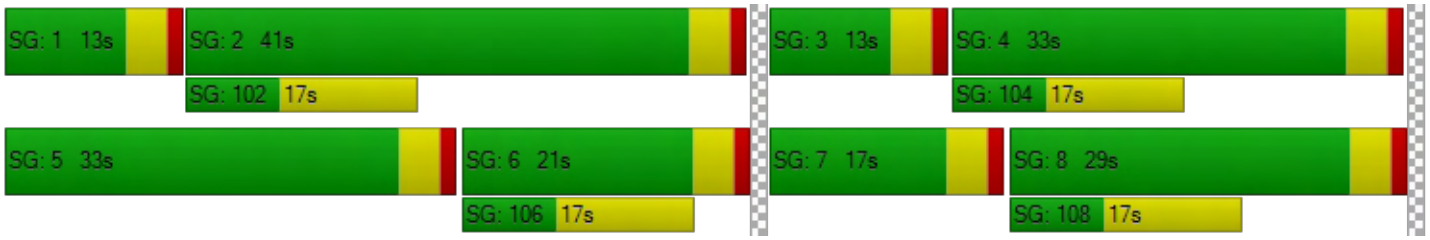
d_M, Delay for Movement [s/veh]	50.92	23.52	11.06	50.38	25.44	26.50	50.36	39.24	41.57	48.63	41.58	49.88
Movement LOS	D	C	B	D	C	C	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	25.14			29.52			41.17			43.54		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	35.04											
Intersection LOS	D											
Intersection V/C	0.643											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.048	3.037	3.050	3.074
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	740	340	500	580
d_b, Bicycle Delay [s]	19.85	34.45	28.13	25.21
l_b,int, Bicycle LOS Score for Intersection	2.343	2.187	2.192	2.423
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	287.3
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	3.064

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	20	16	5	11	3	0	3	8	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	598	45	46	580	45	70	82	42	65	141	94
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	150	11	12	145	11	18	21	11	16	35	24
Total Analysis Volume [veh/h]	50	598	45	46	580	45	70	82	42	65	141	94
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	25	0	0	25	0	0	75	0	0	75	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	21	21	71	71	71	71
g / C, Green / Cycle	0.21	0.21	0.21	0.21	0.71	0.71	0.71	0.71
(v / s)_i Volume / Saturation Flow Rate	0.06	0.34	0.06	0.33	2.42	0.03	1.77	0.06
s, saturation flow rate [veh/h]	813	1877	799	1876	63	1615	116	1615
c, Capacity [veh/h]	72	397	72	397	97	1144	130	1144
d1, Uniform Delay [s]	50.00	39.42	50.00	39.42	32.40	4.36	36.39	4.51
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	43.11	290.16	36.10	270.50	297.75	0.01	297.10	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.69	1.62	0.64	1.57	1.56	0.04	1.59	0.08
d, Delay for Lane Group [s/veh]	93.11	329.58	86.10	309.92	330.15	4.38	333.49	4.54
Lane Group LOS	F	F	F	F	F	A	F	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.11	41.59	1.87	39.41	8.98	0.23	12.60	0.53
50th-Percentile Queue Length [ft/ln]	52.69	1039.71	46.69	985.16	224.45	5.70	315.12	13.20
95th-Percentile Queue Length [veh/ln]	3.79	64.10	3.36	60.58	16.16	0.41	22.69	0.95
95th-Percentile Queue Length [ft/ln]	94.84	1602.61	84.04	1514.56	404.00	10.26	567.22	23.76

Movement, Approach, & Intersection Results

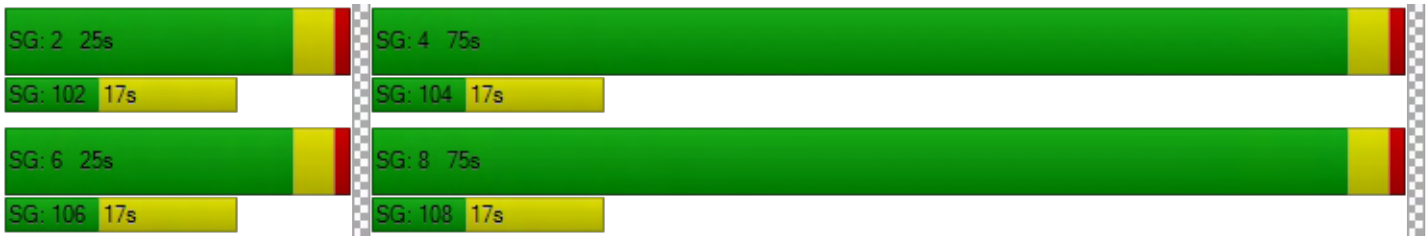
d_M, Delay for Movement [s/veh]	93.11	329.58	329.58	86.10	309.92	309.92	330.15	330.15	4.38	333.49	333.49	4.54
Movement LOS	F	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	312.52			294.58			259.62			230.42		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	287.26											
Intersection LOS	F											
Intersection V/C	3.064											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.565	2.585	2.156	2.164
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	420	420	1420	1420
d_b, Bicycle Delay [s]	31.21	31.21	4.21	4.21
l_b,int, Bicycle LOS Score for Intersection	2.703	2.667	1.880	2.055
Bicycle LOS	B	B	A	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	33.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.743

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	460	101	73	500	67	89	1451	74	135	1077	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	19	34	0	16	17	5	3	22	8	0	29	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	71	503	103	90	527	73	94	1502	83	138	1128	91
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	126	26	23	132	18	24	376	21	35	282	23
Total Analysis Volume [veh/h]	71	503	103	90	527	73	94	1502	83	138	1128	91
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	21	0	11	21	0	22	54	0	14	46	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	45	34	45	35	35	7	34	34	9	37	37
g / C, Green / Cycle	0.45	0.34	0.45	0.35	0.35	0.07	0.34	0.34	0.09	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.07	0.26	0.08	0.28	0.05	0.05	0.29	0.29	0.08	0.22	0.22
s, saturation flow rate [veh/h]	1058	1900	1082	1900	1615	1810	3618	1849	1810	3618	1828
c, Capacity [veh/h]	349	646	368	654	556	123	1233	630	170	1327	671
d1, Uniform Delay [s]	19.68	29.65	19.52	29.81	22.56	45.87	30.63	30.64	44.50	25.87	25.87
k, delay calibration	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.15	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.31	8.96	0.34	10.24	0.49	9.39	1.75	4.57	8.92	0.46	0.90
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.20	0.78	0.24	0.81	0.13	0.76	0.85	0.85	0.81	0.61	0.61
d, Delay for Lane Group [s/veh]	20.99	38.61	19.87	40.04	23.05	55.26	32.38	35.22	53.42	26.32	26.77
Lane Group LOS	C	D	B	D	C	E	C	D	D	C	C
Critical Lane Group	Yes	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.05	12.16	1.22	13.03	1.25	2.61	11.70	12.47	3.75	7.76	7.93
50th-Percentile Queue Length [ft/ln]	26.30	304.03	30.50	325.69	31.16	65.13	292.60	311.80	93.87	194.12	198.34
95th-Percentile Queue Length [veh/ln]	1.89	17.88	2.20	18.95	2.24	4.69	17.31	18.26	6.76	12.33	12.55
95th-Percentile Queue Length [ft/ln]	47.34	447.01	54.91	473.67	56.09	117.23	432.87	456.60	168.97	308.37	313.82

Movement, Approach, & Intersection Results

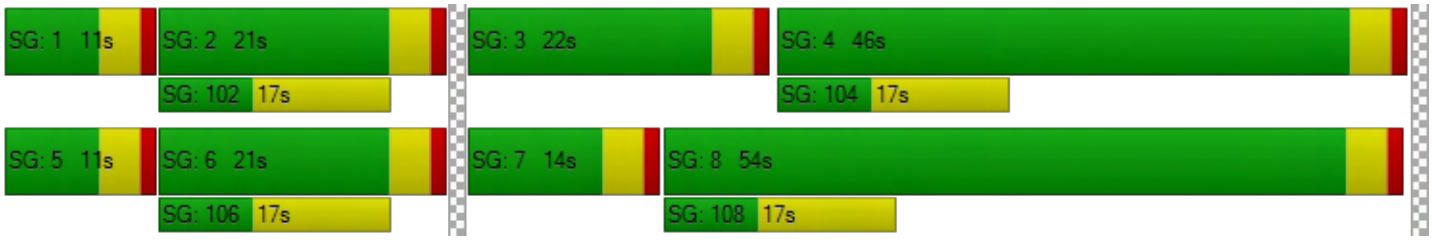
d_M, Delay for Movement [s/veh]	20.99	38.61	0.00	19.87	40.04	23.05	55.26	33.24	35.22	53.42	26.45	26.77
Movement LOS	C	D		B	D	C	E	C	D	D	C	C
d_A, Approach Delay [s/veh]	36.43			35.61			34.57			29.21		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	33.29											
Intersection LOS	C											
Intersection V/C	0.743											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.562	2.573	3.047	3.056
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	340	340	1000	840
d_b, Bicycle Delay [s]	34.45	34.45	12.50	16.82
l_b,int, Bicycle LOS Score for Intersection	2.507	2.698	2.483	2.306
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	98.5
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.594

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	31	563	33	27	592	43	36	107	30	42	103	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	20	16	5	11	3	0	3	8	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	597	37	48	620	49	48	112	31	46	113	83
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	149	9	12	155	12	12	28	8	12	28	21
Total Analysis Volume [veh/h]	32	597	37	48	620	49	48	112	31	46	113	83
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	34	0	0	34	0	0	66	0	0	66	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	31	31	31	31	61	61	61	61
g / C, Green / Cycle	0.31	0.31	0.31	0.31	0.61	0.61	0.61	0.61
(v / s)_i Volume / Saturation Flow Rate	0.04	0.34	0.06	0.36	1.08	0.02	1.02	0.05
s, saturation flow rate [veh/h]	780	1881	806	1876	148	1615	156	1615
c, Capacity [veh/h]	74	607	76	605	135	965	140	965
d1, Uniform Delay [s]	49.99	33.86	49.98	33.86	32.95	8.27	33.35	8.55
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	17.42	48.64	33.26	68.73	134.15	0.01	117.88	0.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.43	1.04	0.63	1.10	1.18	0.03	1.14	0.09
d, Delay for Lane Group [s/veh]	67.41	82.50	83.24	102.60	167.10	8.28	151.23	8.59
Lane Group LOS	E	F	F	F	F	A	F	A
Critical Lane Group	No	No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	1.15	22.73	1.90	26.05	7.05	0.26	6.70	0.71
50th-Percentile Queue Length [ft/ln]	28.85	568.15	47.51	651.15	176.37	6.43	167.44	17.82
95th-Percentile Queue Length [veh/ln]	2.08	31.43	3.42	36.69	12.64	0.46	11.87	1.28
95th-Percentile Queue Length [ft/ln]	51.93	785.85	85.52	917.17	315.98	11.58	296.64	32.07

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	67.41	82.50	82.50	83.24	102.60	102.60	167.10	167.10	8.28	151.23	151.23	8.59
Movement LOS	E	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	81.78			101.30			141.32			102.31		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	98.48											
Intersection LOS	F											
Intersection V/C	1.594											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.534	2.556	2.116	2.156
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	600	600	1240	1240
d_b, Bicycle Delay [s]	24.50	24.50	7.22	7.22
l_b,int, Bicycle LOS Score for Intersection	2.659	2.743	1.875	1.959
Bicycle LOS	B	B	A	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	32.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.662

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	1170	144	228	1250	109	155	916	128	93	656	368
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	43	5	0	28	0	0	2	4	2	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	108	1236	152	233	1303	111	158	936	135	97	670	375
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	309	38	58	326	28	40	234	34	24	168	94
Total Analysis Volume [veh/h]	108	1236	152	233	1303	111	158	936	135	97	670	375
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	17	24	0	14	21	0	15	21	0	41	47	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	43	43	10	46	46	11	24	24	7	20	20	20
g / C, Green / Cycle	0.08	0.43	0.43	0.10	0.46	0.46	0.10	0.24	0.24	0.07	0.20	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.06	0.26	0.26	0.09	0.26	0.26	0.09	0.20	0.20	0.05	0.15	0.15	0.15
s, saturation flow rate [veh/h]	1810	3618	1795	2663	3618	1825	1810	3618	1780	1810	3618	1745	1615
c, Capacity [veh/h]	139	1559	774	268	1646	830	191	861	424	128	735	354	328
d1, Uniform Delay [s]	45.41	21.80	21.80	44.38	20.08	20.09	43.90	36.27	36.28	45.70	37.38	37.41	37.43
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.10	1.68	3.35	8.44	1.44	2.84	8.81	2.20	4.38	8.85	1.45	3.02	3.29
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.78	0.59	0.59	0.87	0.57	0.57	0.83	0.83	0.83	0.76	0.74	0.74	0.74
d, Delay for Lane Group [s/veh]	54.51	23.48	25.16	52.82	21.53	22.93	52.71	38.47	40.67	54.55	38.83	40.42	40.72
Lane Group LOS	D	C	C	D	C	C	D	D	D	D	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.97	8.41	8.71	3.14	8.09	8.49	4.27	8.46	8.59	2.67	6.27	6.23	5.81
50th-Percentile Queue Length [ft/ln]	74.22	210.27	217.72	78.47	202.26	212.29	106.86	211.39	214.85	66.70	156.8	155.7	145.3
95th-Percentile Queue Length [veh/ln]	5.34	13.17	13.55	5.65	12.76	13.27	7.67	13.22	13.40	4.80	10.38	10.32	9.77
95th-Percentile Queue Length [ft/ln]	133.60	329.17	338.71	141.24	318.88	331.76	191.63	330.61	335.05	120.0	259.5	258.1	244.2

Movement, Approach, & Intersection Results

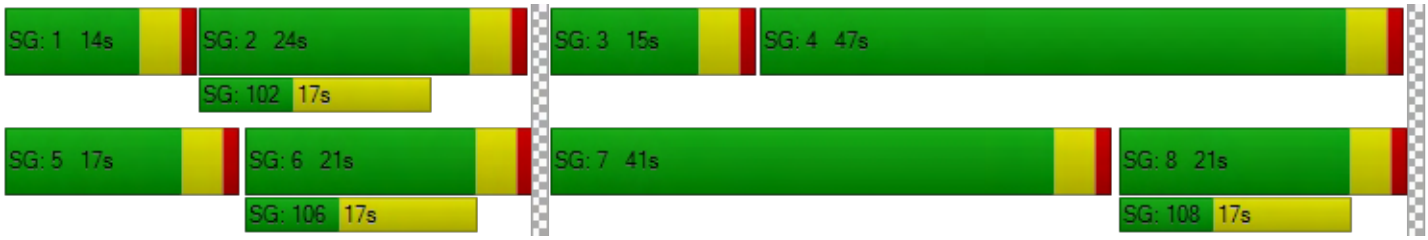
d_M, Delay for Movement [s/veh]	54.51	23.90	25.16	52.82	21.92	22.93	52.71	38.98	40.67	54.55	39.14	40.63
Movement LOS	D	C	C	D	C	C	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	26.24			26.36			40.93			40.93		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	32.59											
Intersection LOS	C											
Intersection V/C	0.662											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	0.00	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.100	0.000	2.894	3.030
Crosswalk LOS	C	F	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	400	340	340	860
d_b, Bicycle Delay [s]	32.00	34.45	34.45	16.25
l_b,int, Bicycle LOS Score for Intersection	2.382	2.465	2.236	2.188
Bicycle LOS	B	B	B	B

Sequence

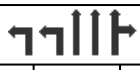
Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	38.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.801

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	166	835	219	303	980	183	211	1292	132	318	990	175
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	28	43	13	20	1	0	15	0	27	29	28
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	169	880	266	322	1020	188	215	1333	135	351	1039	207
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	220	67	81	255	47	54	333	34	88	260	52
Total Analysis Volume [veh/h]	169	880	266	322	1020	188	215	1333	135	351	1039	207
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	24	27	27	18	21	0	14	36	0	19	41	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	25	44	14	28	28	10	30	30	15	35	35
g / C, Green / Cycle	0.11	0.25	0.44	0.14	0.28	0.28	0.10	0.30	0.30	0.15	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.09	0.17	0.16	0.12	0.22	0.22	0.08	0.27	0.27	0.13	0.23	0.23
s, saturation flow rate [veh/h]	1810	5176	1615	2663	3618	1753	2663	3618	1812	2663	3618	1743
c, Capacity [veh/h]	205	1306	714	371	1007	488	266	1080	541	400	1261	608
d1, Uniform Delay [s]	43.40	33.72	18.64	42.18	33.65	33.66	44.14	33.77	33.79	41.66	27.68	27.68
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.34	0.11	0.11	0.19
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.97	2.79	1.49	6.20	6.98	13.48	5.80	3.22	16.04	6.31	0.61	2.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	0.67	0.37	0.87	0.81	0.81	0.81	0.91	0.91	0.88	0.67	0.67
d, Delay for Lane Group [s/veh]	51.37	36.51	20.13	48.38	40.64	47.14	49.94	36.99	49.83	47.97	28.29	29.85
Lane Group LOS	D	D	C	D	D	D	D	D	D	D	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.51	6.66	4.32	4.17	9.99	10.56	2.80	11.60	13.57	4.54	8.43	8.40
50th-Percentile Queue Length [ft/ln]	112.82	166.58	107.89	104.36	249.82	264.12	70.11	290.12	339.20	113.62	210.82	209.89
95th-Percentile Queue Length [veh/ln]	8.00	10.90	7.72	7.51	15.18	15.90	5.05	17.19	19.61	8.04	13.20	13.15
95th-Percentile Queue Length [ft/ln]	199.92	272.42	193.06	187.84	379.43	397.38	126.20	429.79	490.22	201.02	329.88	328.68

Movement, Approach, & Intersection Results

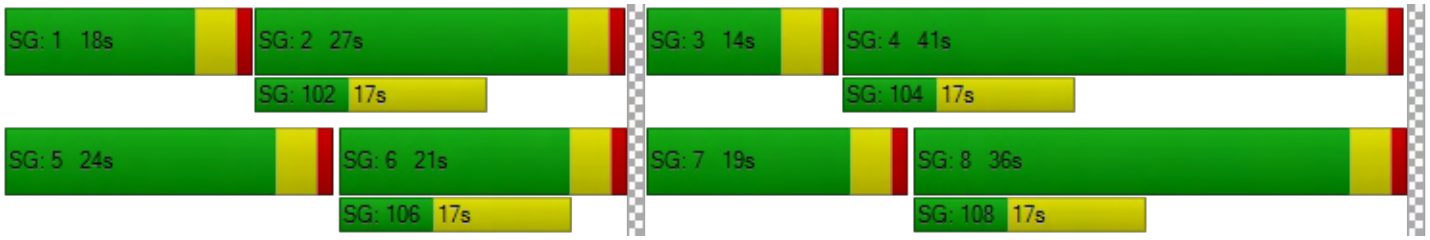
d_M, Delay for Movement [s/veh]	51.37	36.51	20.13	48.38	41.95	47.14	49.94	40.41	49.83	47.97	28.59	29.85
Movement LOS	D	D	C	D	D	D	D	D	D	D	C	C
d_A, Approach Delay [s/veh]	35.11			43.94			42.39			33.01		
Approach LOS	D			D			D			C		
d_I, Intersection Delay [s/veh]	38.77											
Intersection LOS	D											
Intersection V/C	0.801											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.074	3.075	3.106	3.159
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	460	340	640	740
d_b, Bicycle Delay [s]	29.65	34.45	23.12	19.85
l_b,int, Bicycle LOS Score for Intersection	2.283	2.401	2.485	2.438
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



General Plan Buildout (Year 2040) With Project

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	34.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.745

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	82	492	92	40	439	83	84	931	72	69	1128	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	12	0	8	36	2	4	30	21	0	16	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	105	612	112	57	572	103	106	1166	109	84	1392	89
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	153	28	14	143	26	27	292	27	21	348	22
Total Analysis Volume [veh/h]	105	612	112	57	572	103	106	1166	109	84	1392	89
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	23	0	12	21	0	26	21	0	44	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	49	39	49	38	38	8	33	33	6	32	32
g / C, Green / Cycle	0.49	0.39	0.49	0.38	0.38	0.08	0.33	0.33	0.06	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.10	0.32	0.06	0.30	0.06	0.06	0.23	0.23	0.05	0.27	0.27
s, saturation flow rate [veh/h]	1025	1900	979	1900	1615	1810	3618	1818	1810	3618	1842
c, Capacity [veh/h]	369	737	335	718	610	138	1198	602	116	1156	588
d1, Uniform Delay [s]	18.49	27.66	18.58	27.74	20.71	45.41	29.26	29.26	45.98	31.82	31.83
k, delay calibration	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.13
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.93	10.48	0.24	8.97	0.60	8.77	0.78	1.55	8.20	1.84	4.26
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.28	0.83	0.17	0.80	0.17	0.77	0.71	0.71	0.72	0.85	0.85
d, Delay for Lane Group [s/veh]	20.42	38.14	18.82	36.72	21.31	54.18	30.04	30.81	54.19	33.67	36.09
Lane Group LOS	C	D	B	D	C	D	C	C	D	C	D
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.47	14.87	0.69	13.56	1.68	2.90	8.84	9.02	2.30	11.10	11.70
50th-Percentile Queue Length [ft/ln]	36.76	371.68	17.35	338.96	42.09	72.60	221.03	225.40	57.58	277.43	292.48
95th-Percentile Queue Length [veh/ln]	2.65	21.19	1.25	19.60	3.03	5.23	13.72	13.94	4.15	16.56	17.31
95th-Percentile Queue Length [ft/ln]	66.17	529.77	31.23	489.92	75.76	130.67	342.95	348.51	103.65	414.02	432.71

Movement, Approach, & Intersection Results

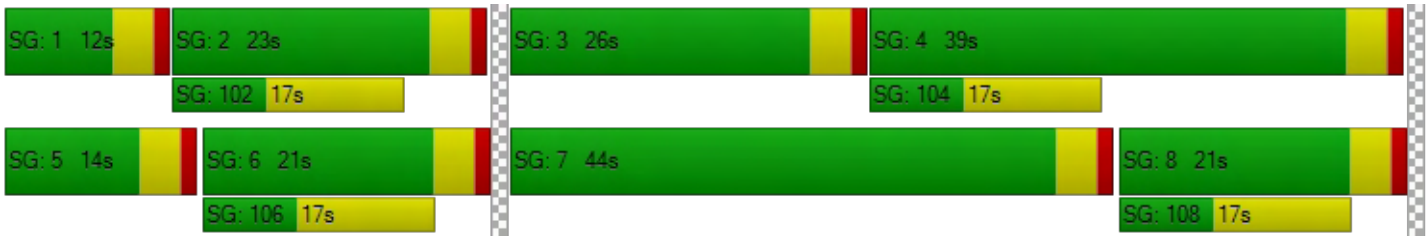
d_M, Delay for Movement [s/veh]	20.42	38.14	0.00	18.82	36.72	21.31	54.18	30.25	30.81	54.19	34.38	36.09
Movement LOS	C	D		B	D	C	D	C	C	D	C	D
d_A, Approach Delay [s/veh]	35.54			33.16			32.13			35.54		
Approach LOS	D			C			C			D		
d_I, Intersection Delay [s/veh]	34.07											
Intersection LOS	C											
Intersection V/C	0.745											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.594	2.605	3.074	3.020
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	380	340	340	700
d_b, Bicycle Delay [s]	32.81	34.45	34.45	21.13
l_b,int, Bicycle LOS Score for Intersection	2.743	2.767	2.319	2.420
Bicycle LOS	B	C	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	469.8
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	4.414

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	40	667	22	28	526	25	78	90	38	47	124	57
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	3	54	19	9	6	9	0	4	2	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	829	30	88	661	40	101	119	46	61	153	83
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	207	8	22	165	10	25	30	12	15	38	21
Total Analysis Volume [veh/h]	49	829	30	88	661	40	101	119	46	61	153	83
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	24	0	0	24	0	0	76	0	0	76	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	20	20	20	20	72	72	72	72
g / C, Green / Cycle	0.20	0.20	0.20	0.20	0.72	0.72	0.72	0.72
(v / s)_i Volume / Saturation Flow Rate	0.06	0.45	0.13	0.37	3.52	0.03	1.61	0.05
s, saturation flow rate [veh/h]	757	1888	653	1881	63	1615	133	1615
c, Capacity [veh/h]	72	380	72	378	97	1161	142	1161
d1, Uniform Delay [s]	50.00	39.95	50.00	39.95	32.99	4.06	37.46	4.16
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	41.28	576.62	177.40	394.25	596.84	0.01	262.09	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.68	2.26	1.22	1.85	2.26	0.04	1.51	0.07
d, Delay for Lane Group [s/veh]	91.28	616.57	227.40	434.20	629.82	4.08	299.55	4.19
Lane Group LOS	F	F	F	F	F	A	F	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.05	69.99	5.34	50.56	17.12	0.24	12.53	0.44
50th-Percentile Queue Length [ft/ln]	51.15	1749.66	133.53	1263.99	427.88	5.92	313.30	10.94
95th-Percentile Queue Length [veh/ln]	3.68	109.31	9.61	78.68	30.81	0.43	22.56	0.79
95th-Percentile Queue Length [ft/ln]	92.07	2732.63	240.35	1966.93	770.18	10.66	563.94	19.70

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	91.28	616.57	616.57	227.40	434.20	434.20	629.82	629.82	4.08	299.55	299.55	4.19
Movement LOS	F	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	588.22			411.13			521.61			217.00		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	469.77											
Intersection LOS	F											
Intersection V/C	4.414											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.631	2.719	2.180	2.244
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	400	400	1440	1440
d_b, Bicycle Delay [s]	32.00	32.00	3.92	3.92
l_b,int, Bicycle LOS Score for Intersection	3.058	2.861	1.999	2.050
Bicycle LOS	C	C	A	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	39.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.821

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	86	1069	170	281	1098	137	120	544	75	105	1052	358
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	21	1	0	46	0	0	1	8	5	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	107	1325	208	343	1386	167	146	665	100	133	1284	437
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	331	52	86	347	42	37	166	25	33	321	109
Total Analysis Volume [veh/h]	107	1325	208	343	1386	167	146	665	100	133	1284	437
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	33	36	0	18	21	0	14	21	0	25	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	33	33	14	40	40	10	28	28	9	27	27	27
g / C, Green / Cycle	0.08	0.33	0.33	0.14	0.40	0.40	0.10	0.28	0.28	0.09	0.27	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.06	0.28	0.28	0.13	0.29	0.29	0.08	0.14	0.14	0.07	0.24	0.24	0.24
s, saturation flow rate [veh/h]	1810	3618	1771	2663	3618	1798	1810	3618	1776	1810	3618	1869	1615
c, Capacity [veh/h]	138	1203	589	373	1434	712	177	996	489	167	975	504	435
d1, Uniform Delay [s]	45.36	31.15	31.17	42.46	25.55	25.60	44.28	30.61	30.66	44.51	35.22	35.23	35.34
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.31	0.32
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.84	7.89	14.81	9.35	3.19	6.37	9.16	0.41	0.85	8.41	3.25	14.75	17.83
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.77	0.86	0.86	0.92	0.72	0.73	0.82	0.51	0.52	0.80	0.90	0.90	0.91
d, Delay for Lane Group [s/veh]	54.20	39.04	45.97	51.81	28.74	31.97	53.44	31.02	31.51	52.92	38.47	49.98	53.17
Lane Group LOS	D	D	D	D	C	C	D	C	C	D	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.93	12.59	13.48	4.62	10.73	11.36	3.97	5.19	5.21	3.60	10.46	12.44	11.24
50th-Percentile Queue Length [ft/ln]	73.28	314.77	336.90	115.52	268.15	283.92	99.37	129.72	130.25	89.95	261.6	310.9	280.9
95th-Percentile Queue Length [veh/ln]	5.28	18.41	19.50	8.15	16.10	16.88	7.15	8.92	8.95	6.48	15.77	18.22	16.73
95th-Percentile Queue Length [ft/ln]	131.90	460.25	487.41	203.66	402.43	422.09	178.87	223.11	223.84	161.9	394.2	455.5	418.3

Movement, Approach, & Intersection Results

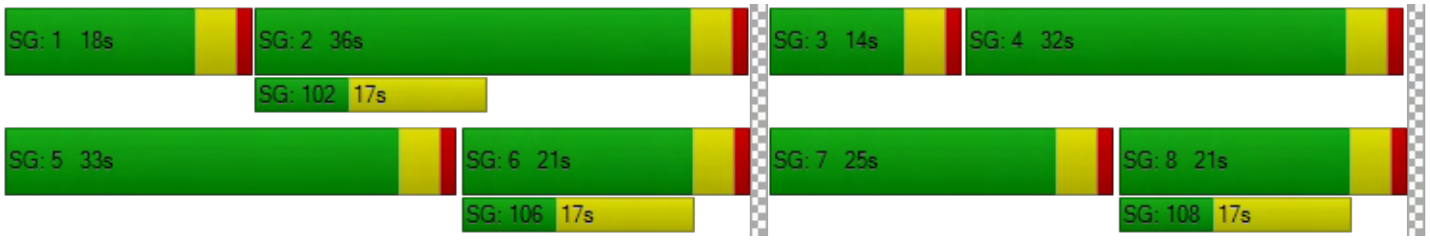
d_M, Delay for Movement [s/veh]	54.20	40.59	45.97	51.81	29.56	31.97	53.44	31.14	31.51	52.92	42.14	53.12
Movement LOS	D	D	D	D	C	C	D	C	C	D	D	D
d_A, Approach Delay [s/veh]	42.16			33.79			34.75			45.44		
Approach LOS	D			C			C			D		
d_I, Intersection Delay [s/veh]	39.54											
Intersection LOS	D											
Intersection V/C	0.821											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	0.00	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.127	0.000	2.943	3.104
Crosswalk LOS	C	F	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	640	340	340	560
d_b, Bicycle Delay [s]	23.12	34.45	34.45	25.92
l_b,int, Bicycle LOS Score for Intersection	2.462	2.602	2.061	2.579
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	38.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.767

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	167	1031	161	149	765	147	177	836	85	231	1124	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	24	28	31	0	1	28	0	51	10	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	204	1273	220	210	964	179	217	1048	104	333	1381	150
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	318	55	53	241	45	54	262	26	83	345	38
Total Analysis Volume [veh/h]	204	1273	220	210	964	179	217	1048	104	333	1381	150
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	28	35	35	14	21	0	14	33	0	18	37	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	13	33	51	10	30	30	10	27	27	14	31	31
g / C, Green / Cycle	0.13	0.33	0.51	0.10	0.30	0.30	0.10	0.27	0.27	0.14	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.11	0.25	0.14	0.08	0.21	0.21	0.08	0.21	0.21	0.13	0.28	0.28
s, saturation flow rate [veh/h]	1810	5176	1615	2663	3618	1752	2663	3618	1813	2663	3618	1806
c, Capacity [veh/h]	242	1717	827	261	1071	519	268	976	489	374	1121	560
d1, Uniform Delay [s]	42.33	29.65	13.79	44.22	31.53	31.53	44.11	33.88	33.88	42.28	33.21	33.26
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.24	0.11	0.11	0.35
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.71	2.93	0.79	5.73	4.17	8.35	5.84	1.44	6.01	7.35	3.24	16.74
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.84	0.74	0.27	0.80	0.72	0.72	0.81	0.79	0.79	0.89	0.91	0.91
d, Delay for Lane Group [s/veh]	50.04	32.57	14.58	49.95	35.69	39.88	49.95	35.32	39.89	49.63	36.45	50.00
Lane Group LOS	D	C	B	D	D	D	D	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	5.39	9.30	2.90	2.74	8.78	9.11	2.83	8.66	9.31	4.38	12.06	14.21
50th-Percentile Queue Length [ft/ln]	134.85	232.44	72.56	68.46	219.57	227.80	70.78	216.58	232.74	109.52	301.52	355.15
95th-Percentile Queue Length [veh/ln]	9.20	14.30	5.22	4.93	13.64	14.06	5.10	13.49	14.31	7.81	17.76	20.39
95th-Percentile Queue Length [ft/ln]	230.08	357.46	130.60	123.23	341.08	351.56	127.41	337.26	357.83	195.34	443.91	509.69

Movement, Approach, & Intersection Results

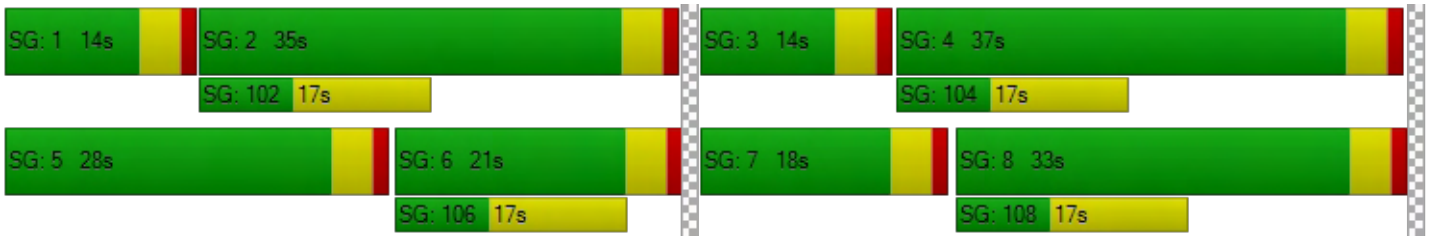
d_M, Delay for Movement [s/veh]	50.04	32.57	14.58	49.95	36.53	39.88	49.95	36.54	39.89	49.63	40.00	50.00
Movement LOS	D	C	B	D	D	D	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	32.34			39.06			38.92			42.52		
Approach LOS	C			D			D			D		
d_I, Intersection Delay [s/veh]	38.24											
Intersection LOS	D											
Intersection V/C	0.767											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.108	3.095	3.112	3.138
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	620	340	580	660
d_b, Bicycle Delay [s]	23.81	34.45	25.21	22.45
l_b,int, Bicycle LOS Score for Intersection	2.493	2.304	2.313	2.585
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	377.9
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	3.533

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	20	16	5	11	3	0	3	8	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	711	53	51	691	53	82	97	50	77	167	103
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	178	13	13	173	13	21	24	13	19	42	26
Total Analysis Volume [veh/h]	60	711	53	51	691	53	82	97	50	77	167	103
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	26	0	0	26	0	0	74	0	0	74	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	22	22	70	70	70	70
g / C, Green / Cycle	0.22	0.22	0.22	0.22	0.70	0.70	0.70	0.70
(v / s)_i Volume / Saturation Flow Rate	0.08	0.41	0.07	0.40	2.77	0.03	2.06	0.06
s, saturation flow rate [veh/h]	728	1877	714	1876	65	1615	118	1615
c, Capacity [veh/h]	72	416	72	416	98	1128	130	1128
d1, Uniform Delay [s]	50.00	38.93	50.00	38.93	31.92	4.69	36.01	4.85
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	66.23	386.33	45.11	365.22	412.34	0.02	422.74	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.83	1.84	0.71	1.79	1.83	0.04	1.88	0.09
d, Delay for Lane Group [s/veh]	116.23	425.25	95.11	404.15	444.26	4.71	458.75	4.89
Lane Group LOS	F	F	F	F	F	A	F	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.82	54.63	2.17	52.17	12.13	0.29	17.15	0.61
50th-Percentile Queue Length [ft/ln]	70.47	1365.67	54.31	1304.33	303.29	7.18	428.67	15.31
95th-Percentile Queue Length [veh/ln]	5.07	84.97	3.91	81.02	21.84	0.52	30.86	1.10
95th-Percentile Queue Length [ft/ln]	126.85	2124.26	97.75	2025.57	545.93	12.92	771.60	27.57

Movement, Approach, & Intersection Results

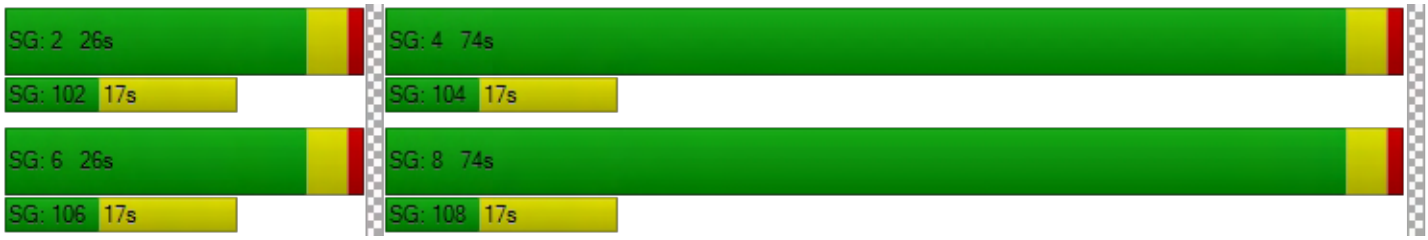
d_M, Delay for Movement [s/veh]	116.23	425.25	425.25	95.11	404.15	404.15	444.26	444.26	4.71	458.75	458.75	4.89
Movement LOS	F	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	402.75			384.32			348.29			324.03		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	377.95											
Intersection LOS	F											
Intersection V/C	3.533											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.646	2.665	2.196	2.196
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	440	440	1400	1400
d_b, Bicycle Delay [s]	30.42	30.42	4.50	4.50
l_b,int, Bicycle LOS Score for Intersection	2.919	2.871	1.937	2.132
Bicycle LOS	C	C	A	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	46.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.885

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	460	101	73	500	67	89	1451	74	135	1077	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	19	34	0	16	17	5	3	22	8	0	29	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	81	595	123	105	627	87	112	1792	98	165	1343	107
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	149	31	26	157	22	28	448	25	41	336	27
Total Analysis Volume [veh/h]	81	595	123	105	627	87	112	1792	98	165	1343	107
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	26	36	0	11	21	0	12	39	0	14	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	43	32	43	33	33	8	35	35	10	37	37
g / C, Green / Cycle	0.43	0.32	0.43	0.33	0.33	0.08	0.35	0.35	0.10	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.08	0.31	0.10	0.33	0.05	0.06	0.35	0.35	0.09	0.27	0.27
s, saturation flow rate [veh/h]	1003	1900	1030	1900	1615	1810	3618	1850	1810	3618	1829
c, Capacity [veh/h]	277	618	299	624	531	140	1261	645	181	1343	679
d1, Uniform Delay [s]	22.74	33.17	22.42	33.57	23.82	45.37	32.42	32.48	44.56	26.95	26.95
k, delay calibration	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.45	0.11	0.11	0.25
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.67	28.24	0.70	37.02	0.66	9.97	9.79	32.26	15.78	0.73	3.26
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.29	0.96	0.35	1.00	0.16	0.80	0.99	0.99	0.91	0.72	0.72
d, Delay for Lane Group [s/veh]	25.41	61.40	23.12	70.59	24.49	55.34	42.21	64.74	60.35	27.68	30.21
Lane Group LOS	C	E	C	F	C	E	D	E	E	C	C
Critical Lane Group	Yes	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.30	18.60	1.50	21.10	1.55	3.10	16.21	20.68	4.81	9.69	10.28
50th-Percentile Queue Length [ft/ln]	32.54	465.07	37.49	527.53	38.73	77.59	405.16	517.11	120.24	242.30	257.06
95th-Percentile Queue Length [veh/ln]	2.34	25.68	2.70	28.71	2.79	5.59	22.81	28.14	8.41	14.80	15.54
95th-Percentile Queue Length [ft/ln]	58.58	641.90	67.47	717.87	69.71	139.67	570.22	703.58	210.15	369.94	388.54

Movement, Approach, & Intersection Results

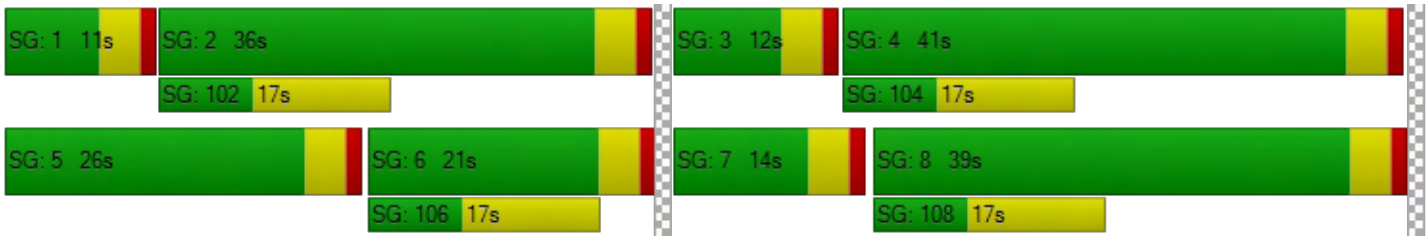
d_M, Delay for Movement [s/veh]	25.41	61.40	0.00	23.12	70.59	24.49	55.34	49.04	64.74	60.35	28.39	30.21
Movement LOS	C	E		C	F	C	E	D	E	E	C	C
d_A, Approach Delay [s/veh]	57.09			59.61			50.16			31.78		
Approach LOS	E			E			D			C		
d_I, Intersection Delay [s/veh]	46.78											
Intersection LOS	D											
Intersection V/C	0.885											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.610	2.623	3.128	3.139
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	640	340	700	740
d_b, Bicycle Delay [s]	23.12	34.45	21.13	19.85
l_b,int, Bicycle LOS Score for Intersection	2.675	2.911	2.661	2.448
Bicycle LOS	B	C	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	182.9
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.850

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	31	563	33	27	592	43	36	107	30	42	103	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	20	16	5	11	3	0	3	8	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	710	43	53	738	57	55	134	37	54	134	89
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	178	11	13	185	14	14	34	9	14	34	22
Total Analysis Volume [veh/h]	38	710	43	53	738	57	55	134	37	54	134	89
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	35	0	0	35	0	0	65	0	0	65	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	31	31	31	31	61	61	61	61
g / C, Green / Cycle	0.31	0.31	0.31	0.31	0.61	0.61	0.61	0.61
(v / s)_i Volume / Saturation Flow Rate	0.05	0.40	0.07	0.42	1.24	0.02	1.21	0.06
s, saturation flow rate [veh/h]	694	1881	721	1876	152	1615	155	1615
c, Capacity [veh/h]	72	587	72	585	139	982	141	982
d1, Uniform Delay [s]	50.00	34.41	50.00	34.41	33.65	7.86	33.79	8.12
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	24.98	140.33	49.19	172.39	201.01	0.02	191.72	0.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.53	1.28	0.74	1.36	1.36	0.04	1.34	0.09
d, Delay for Lane Group [s/veh]	74.98	174.74	99.19	206.80	234.67	7.87	225.51	8.16
Lane Group LOS	E	F	F	F	F	A	F	A
Critical Lane Group	No	No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	1.45	36.72	2.30	41.84	9.90	0.31	9.67	0.76
50th-Percentile Queue Length [ft/ln]	36.14	918.02	57.59	1045.94	247.50	7.66	241.69	19.05
95th-Percentile Queue Length [veh/ln]	2.60	53.97	4.15	62.29	17.82	0.55	17.40	1.37
95th-Percentile Queue Length [ft/ln]	65.06	1349.17	103.67	1557.26	445.50	13.78	435.04	34.28

Movement, Approach, & Intersection Results

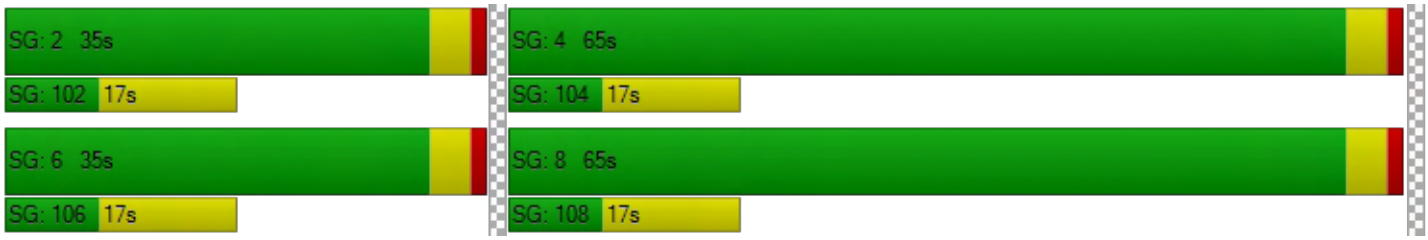
d_M, Delay for Movement [s/veh]	74.98	174.74	174.74	99.19	206.80	206.80	234.67	234.67	7.87	225.51	225.51	8.16
Movement LOS	E	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	169.95			200.07			197.54			155.68		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	182.94											
Intersection LOS	F											
Intersection V/C	1.850											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.608	2.629	2.147	2.185
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	620	620	1220	1220
d_b, Bicycle Delay [s]	23.81	23.81	7.61	7.61
l_b,int, Bicycle LOS Score for Intersection	2.865	2.959	1.933	2.017
Bicycle LOS	C	C	A	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	27.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.755

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	73	495	277	80	499	97	84	1383	105	183	879	79
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	2	0	6	13	18	22	0	7	50	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	612	340	98	615	131	120	1709	128	230	1122	96
Peak Hour Factor	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	157	87	25	158	34	31	438	33	59	287	25
Total Analysis Volume [veh/h]	91	627	348	100	630	134	123	1751	131	236	1150	98
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	13	41	0	18	46	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	27	45	27	27	27	8	37	37	14	43	43
g / C, Green / Cycle	0.30	0.30	0.50	0.30	0.30	0.30	0.09	0.41	0.41	0.16	0.48	0.48
(v / s)_i Volume / Saturation Flow Rate	0.11	0.17	0.22	0.12	0.17	0.08	0.07	0.34	0.35	0.13	0.23	0.23
s, saturation flow rate [veh/h]	809	3618	1615	811	3618	1615	1810	3618	1833	1810	3618	1825
c, Capacity [veh/h]	185	1085	806	186	1085	484	157	1490	755	280	1737	876
d1, Uniform Delay [s]	38.42	26.70	14.39	38.82	26.73	24.07	40.32	23.78	23.84	36.99	15.79	15.79
k, delay calibration	0.11	0.11	0.19	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.02	0.49	0.65	2.40	0.49	0.31	8.31	5.75	10.93	6.73	0.94	1.86
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.49	0.58	0.43	0.54	0.58	0.28	0.78	0.84	0.84	0.84	0.48	0.48
d, Delay for Lane Group [s/veh]	40.43	27.19	15.04	41.22	27.23	24.38	48.62	29.52	34.77	43.73	16.74	17.66
Lane Group LOS	D	C	B	D	C	C	D	C	C	D	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.02	5.53	4.32	2.28	5.65	2.18	2.97	12.23	13.57	5.42	5.54	5.81
50th-Percentile Queue Length [ft/ln]	50.40	138.36	107.96	56.88	141.33	54.46	74.22	305.79	339.25	135.39	138.54	145.35
95th-Percentile Queue Length [veh/ln]	3.63	9.39	7.73	4.10	9.55	3.92	5.34	17.97	19.61	9.23	9.40	9.77
95th-Percentile Queue Length [ft/ln]	90.73	234.81	193.16	102.38	238.81	98.03	133.60	449.19	490.28	230.81	235.05	244.21

Movement, Approach, & Intersection Results

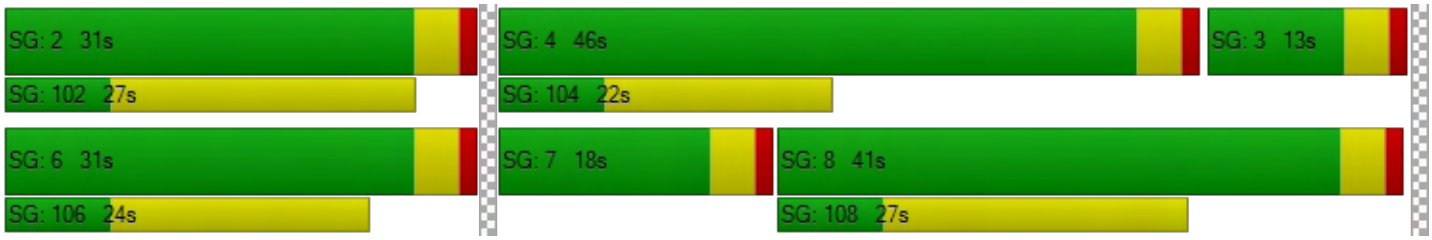
d_M, Delay for Movement [s/veh]	40.43	27.19	15.04	41.22	27.23	24.38	48.62	31.03	34.77	43.73	16.99	17.66
Movement LOS	D	C	B	D	C	C	D	C	C	D	B	B
d_A, Approach Delay [s/veh]	24.36			28.40			32.36			21.29		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	27.12											
Intersection LOS	C											
Intersection V/C	0.755											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.843	2.731	3.272	3.334
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	600	600	822	933
d_b, Bicycle Delay [s]	22.05	22.05	15.61	12.80
l_b,int, Bicycle LOS Score for Intersection	2.439	2.272	2.662	2.376
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	15.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.754

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	25	106	29	51	134	84	107	1682	54	58	1030	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	27	4	40	14	10	0	0	17	11
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	135	35	89	167	142	145	2062	66	71	1274	85
Peak Hour Factor	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	35	9	23	44	37	38	541	17	19	335	22
Total Analysis Volume [veh/h]	33	142	37	93	175	149	152	2166	69	75	1338	89
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	44.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	34	0	0	34	0	0	56	0	0	56	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	25	25	57	57	57	57	57	57
g / C, Green / Cycle	0.28	0.28	0.64	0.64	0.64	0.64	0.64	0.64
(v / s)_i Volume / Saturation Flow Rate	0.13	0.26	0.40	0.41	0.41	0.43	0.26	0.26
s, saturation flow rate [veh/h]	1616	1635	381	3618	1870	174	3618	1840
c, Capacity [veh/h]	491	499	265	2300	1189	143	2300	1170
d1, Uniform Delay [s]	26.69	31.50	19.83	10.04	10.08	31.23	8.07	8.07
k, delay calibration	0.11	0.28	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.60	9.10	8.74	1.37	2.68	13.06	0.55	1.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.43	0.84	0.57	0.64	0.64	0.52	0.41	0.41
d, Delay for Lane Group [s/veh]	27.29	40.60	28.57	11.41	12.77	44.29	8.62	9.14
Lane Group LOS	C	D	C	B	B	D	A	A
Critical Lane Group	No	Yes	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.73	9.76	3.17	8.14	8.94	2.18	4.16	4.40
50th-Percentile Queue Length [ft/ln]	93.21	244.04	79.20	203.55	223.42	54.42	103.95	110.00
95th-Percentile Queue Length [veh/ln]	6.71	14.89	5.70	12.82	13.84	3.92	7.48	7.84
95th-Percentile Queue Length [ft/ln]	167.77	372.14	142.57	320.54	345.98	97.96	187.11	196.01

Movement, Approach, & Intersection Results

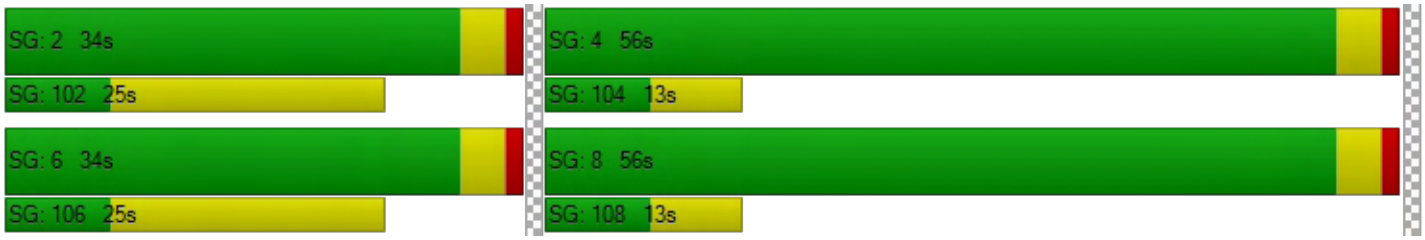
d_M, Delay for Movement [s/veh]	27.29	27.29	27.29	40.60	40.60	40.60	28.57	11.85	12.77	44.29	8.77	9.14
Movement LOS	C	C	C	D	D	D	C	B	B	D	A	A
d_A, Approach Delay [s/veh]	27.29			40.60			12.94			10.57		
Approach LOS	C			D			B			B		
d_I, Intersection Delay [s/veh]	15.38											
Intersection LOS	B											
Intersection V/C	0.754											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.080	2.416	3.185	3.255
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	667	667	1156	1156
d_b, Bicycle Delay [s]	20.00	20.00	8.02	8.02
l_b,int, Bicycle LOS Score for Intersection	1.909	2.248	2.872	2.386
Bicycle LOS	A	B	C	B

Sequence

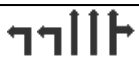
Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	38.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.789

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	1170	144	228	1250	109	155	916	128	93	656	368
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	43	5	0	28	0	0	2	4	2	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	128	1470	181	278	1553	133	189	1120	160	115	801	449
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	368	45	70	388	33	47	280	40	29	200	112
Total Analysis Volume [veh/h]	128	1470	181	278	1553	133	189	1120	160	115	801	449
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	19	24	0	16	21	0	16	21	0	39	44	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	36	36	12	39	39	12	28	28	8	24	24	24
g / C, Green / Cycle	0.09	0.36	0.36	0.12	0.39	0.39	0.12	0.28	0.28	0.08	0.24	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.07	0.30	0.31	0.10	0.31	0.31	0.10	0.24	0.24	0.06	0.18	0.18	0.18
s, saturation flow rate [veh/h]	1810	3618	1795	2663	3618	1824	1810	3618	1781	1810	3618	1743	1615
c, Capacity [veh/h]	161	1293	642	321	1407	710	218	1013	499	149	874	421	390
d1, Uniform Delay [s]	44.72	29.73	29.77	43.24	27.06	27.12	43.24	34.02	34.02	45.04	35.08	35.08	35.08
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.12	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.57	7.25	13.65	7.01	4.72	9.15	9.93	2.06	4.62	8.26	1.26	2.59	2.79
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.79	0.85	0.85	0.87	0.80	0.80	0.87	0.85	0.85	0.77	0.74	0.74	0.74
d, Delay for Lane Group [s/veh]	53.28	36.98	43.42	50.25	31.78	36.27	53.18	36.08	38.64	53.30	36.34	37.67	37.88
Lane Group LOS	D	D	D	D	C	D	D	D	D	D	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	3.48	13.15	14.24	3.66	12.32	13.38	5.15	9.92	10.13	3.12	7.34	7.23	6.73
50th-Percentile Queue Length [ft/ln]	86.90	328.85	356.07	91.51	307.93	334.41	128.85	248.10	253.14	78.04	183.5	180.8	168.1
95th-Percentile Queue Length [veh/ln]	6.26	19.10	20.43	6.59	18.07	19.37	8.88	15.09	15.34	5.62	11.79	11.64	10.98
95th-Percentile Queue Length [ft/ln]	156.41	477.55	510.80	164.72	451.82	484.37	221.93	377.26	383.61	140.4	294.6	291.1	274.5

Movement, Approach, & Intersection Results

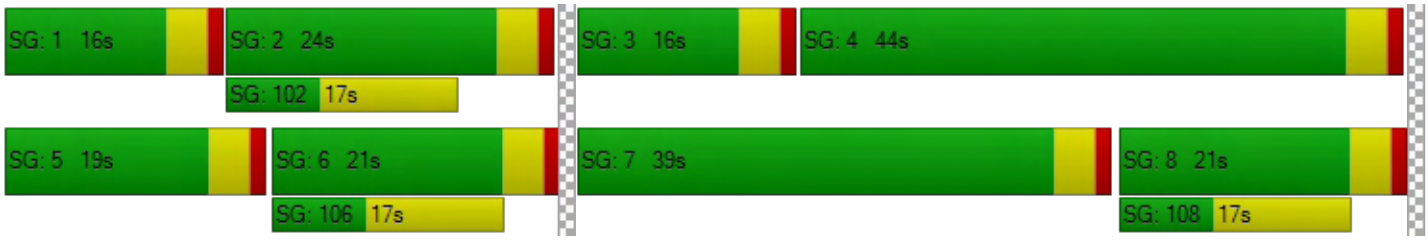
d_M, Delay for Movement [s/veh]	53.28	38.59	43.42	50.25	33.04	36.27	53.18	36.68	38.64	53.30	36.59	37.81
Movement LOS	D	D	D	D	C	D	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	40.14			35.69			39.01			38.40		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	38.20											
Intersection LOS	D											
Intersection V/C	0.789											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	0.00	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.170	0.000	2.951	3.089
Crosswalk LOS	C	F	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	400	340	340	800
d_b, Bicycle Delay [s]	32.00	34.45	34.45	18.00
l_b,int, Bicycle LOS Score for Intersection	2.538	2.640	2.368	2.310
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	54.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.957

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	166	835	219	303	980	183	211	1292	132	318	990	175
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	28	43	13	20	1	0	15	0	27	29	28
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	203	1047	310	383	1216	224	257	1591	161	415	1237	242
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	262	78	96	304	56	64	398	40	104	309	61
Total Analysis Volume [veh/h]	203	1047	310	383	1216	224	257	1591	161	415	1237	242
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	26	26	19	30	0	15	36	0	19	40	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	22	41	15	26	26	11	32	32	15	36	36
g / C, Green / Cycle	0.11	0.22	0.41	0.15	0.26	0.26	0.11	0.32	0.32	0.15	0.36	0.36
(v / s)_i Volume / Saturation Flow Rate	0.11	0.20	0.19	0.14	0.27	0.27	0.10	0.32	0.32	0.16	0.28	0.28
s, saturation flow rate [veh/h]	1810	5176	1615	2663	3618	1753	2663	3618	1812	2663	3618	1746
c, Capacity [veh/h]	199	1147	665	400	947	459	293	1151	577	400	1296	625
d1, Uniform Delay [s]	44.51	37.98	21.42	42.20	36.93	36.93	43.84	34.10	34.10	42.51	28.43	28.51
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.46	0.11	0.11	0.29
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	34.35	12.43	2.34	13.12	35.26	49.40	8.17	15.35	40.85	31.57	0.99	5.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.02	0.91	0.47	0.96	1.02	1.03	0.88	1.01	1.02	1.04	0.77	0.77
d, Delay for Lane Group [s/veh]	78.86	50.42	23.76	55.32	72.19	86.33	52.01	49.46	74.95	74.08	29.41	33.90
Lane Group LOS	F	D	C	E	F	F	D	F	F	F	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	6.79	9.53	5.60	5.36	15.95	17.26	3.44	15.99	20.10	6.63	10.42	10.92
50th-Percentile Queue Length [ft/ln]	169.85	238.22	140.11	134.12	398.71	431.46	85.98	399.75	502.62	165.69	260.56	273.12
95th-Percentile Queue Length [veh/ln]	11.15	14.59	9.49	9.16	22.81	24.48	6.19	22.72	27.80	11.03	15.72	16.35
95th-Percentile Queue Length [ft/ln]	278.73	364.79	237.17	229.09	570.27	612.01	154.77	568.04	694.92	275.64	392.93	408.64

Movement, Approach, & Intersection Results

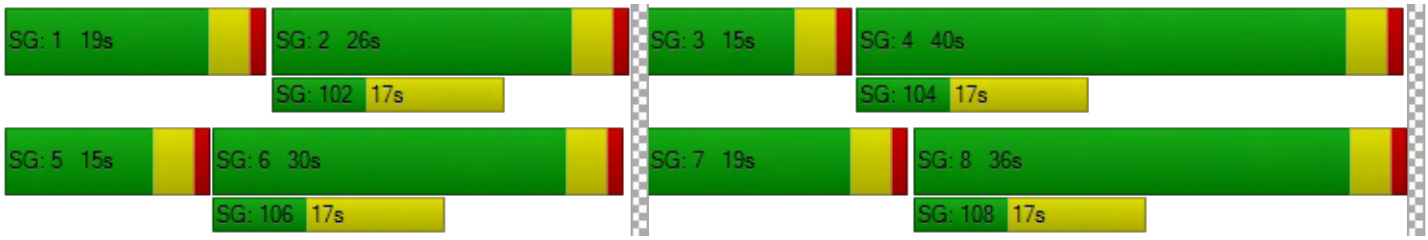
d_M, Delay for Movement [s/veh]	78.86	50.42	23.76	55.32	75.07	86.33	52.01	56.29	74.95	74.08	30.29	33.90
Movement LOS	F	D	C	E	E	F	D	E	E	F	C	C
d_A, Approach Delay [s/veh]	48.82			72.30			57.24			40.35		
Approach LOS	D			E			E			D		
d_I, Intersection Delay [s/veh]	54.81											
Intersection LOS	D											
Intersection V/C	0.957											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.139	3.141	3.178	3.239
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	440	520	640	720
d_b, Bicycle Delay [s]	30.42	27.38	23.12	20.48
l_b,int, Bicycle LOS Score for Intersection	2.418	2.562	2.665	2.601
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 20: Cherry Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	30.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.794

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	118.00	135.00	100.00	100.00	180.00	100.00	100.00	186.00	100.00	100.00
Speed [mph]	30.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	78	419	41	185	588	235	195	1413	78	72	891	170
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	5	0	8	3	0	0	30	7	0	26	14
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	97	516	50	234	720	287	238	1754	102	88	1113	221
Peak Hour Factor	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	132	13	60	184	74	61	449	26	23	285	57
Total Analysis Volume [veh/h]	99	529	51	240	738	294	244	1797	105	90	1140	226
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	86.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	29	0	11	29	0	18	39	0	11	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	0	0	0	12	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	32	21	21	32	22	22	14	40	40	6	32	32
g / C, Green / Cycle	0.36	0.23	0.23	0.36	0.24	0.24	0.16	0.44	0.44	0.07	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.10	0.15	0.16	0.21	0.20	0.18	0.13	0.35	0.35	0.05	0.25	0.25
s, saturation flow rate [veh/h]	1018	1900	1842	1120	3618	1615	1810	3618	1847	1810	3618	1743
c, Capacity [veh/h]	335	442	429	392	865	386	284	1593	813	128	1282	618
d1, Uniform Delay [s]	21.91	31.39	31.41	22.96	32.79	31.91	37.06	21.64	21.71	40.98	25.23	25.23
k, delay calibration	0.11	0.11	0.11	0.19	0.11	0.12	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.49	1.72	1.79	2.70	2.51	3.40	7.52	4.05	7.85	6.86	3.50	7.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.30	0.66	0.67	0.61	0.85	0.76	0.86	0.79	0.79	0.70	0.72	0.72
d, Delay for Lane Group [s/veh]	22.39	33.12	33.20	25.66	35.30	35.31	44.58	25.68	29.55	47.83	28.73	32.29
Lane Group LOS	C	C	C	C	D	D	D	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.43	5.88	5.73	3.95	7.78	6.17	5.67	11.38	12.58	2.15	8.69	8.99
50th-Percentile Queue Length [ft/ln]	35.77	147.05	143.22	98.86	194.55	154.13	141.75	284.46	314.49	53.82	217.31	224.77
95th-Percentile Queue Length [veh/ln]	2.58	9.86	9.65	7.12	12.36	10.24	9.57	16.91	18.40	3.88	13.53	13.91
95th-Percentile Queue Length [ft/ln]	64.38	246.49	241.36	177.94	308.93	255.93	239.37	422.76	459.90	96.88	338.20	347.71

Movement, Approach, & Intersection Results

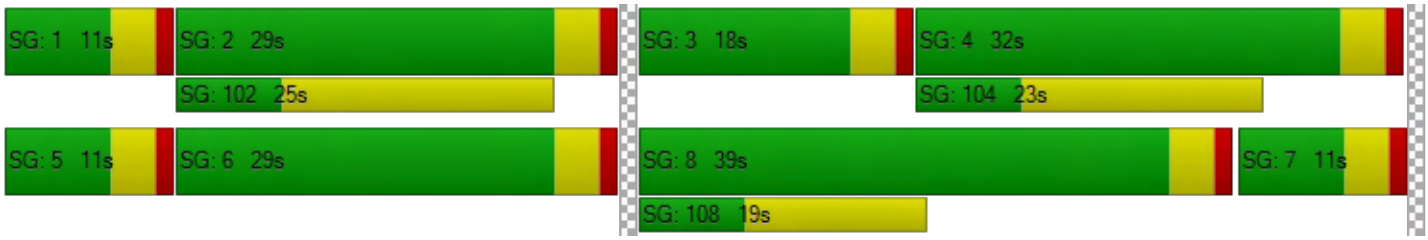
d_M, Delay for Movement [s/veh]	22.39	33.15	33.20	25.66	35.30	35.31	44.58	26.85	29.55	47.83	29.41	32.29
Movement LOS	C	C	C	C	D	D	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	31.59			33.49			28.99			31.00		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	30.87											
Intersection LOS	C											
Intersection V/C	0.794											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.614	2.821	0.000	3.257
Crosswalk LOS	B	C	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	556	556	778	622
d_b, Bicycle Delay [s]	23.47	23.47	16.81	21.36
l_b,int, Bicycle LOS Score for Intersection	2.120	2.609	2.740	2.360
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



July 5, 2019

Mr. Steven Christie, Development Manager
SIGNAL HILL XC, LLC
3010 Old Ranch Parkway, Suite 470
Seal Beach, CA 90740

RE: Signal Hill Business Center Supplemental Traffic Analysis
18-0056

Dear Mr. Christie:

INTRODUCTION

Ganddini Group is pleased to submit this Supplemental Traffic Analysis for the Signal Hill Business Center project. The purpose of this Supplemental Traffic Analysis is to evaluate the potential for additional project traffic impacts based on two additional thresholds not included in the Signal Hill Business Center Traffic Impact Analysis.

This traffic analysis supplements the Signal Hill Business Center Traffic Impact Analysis (Kunzman Associates, Inc., Final July 2019) ["Project Traffic Impact Analysis"] and the Supplemental Afternoon School Peak Hour Analysis (Kunzman Associates, Inc, May 31, 2018). The project site is generally bounded by Gundry Avenue to the west, Gundry Hill Apartments and American University of Health Sciences to the north, Gaviota Avenue to the east, and the Signal Hill City Limits and Alamitos Avenue to the south. The project site is currently vacant. The proposed project involves developing the project site with a business park consisting of nine buildings totaling 139,080 square feet plus 12,000 square feet of mezzanine, for a total of 151,080 square feet of gross floor area. Full access driveways are proposed at Gundry Avenue, Walnut Avenue, and Alamitos Avenue. The proposed project is anticipated to be constructed and fully operational by Year 2020.

Although this is a technical report, effort has been made to write the report clearly and concisely. To assist the reader with technical terms related to transportation engineering, a glossary is provided in Appendix A.

THRESHOLDS OF SIGNIFICANCE

Per City of Signal Hill traffic study criteria, the intersection mitigation requirement should include (all) following elements:

- Drop of 0.02 (2%) in LOS (ICU); or
- 40 vehicles added to an intersection; or
- Left-turn queue length is greater than the existing storage length.

As requested by City of Signal Hill staff, this Supplemental Traffic Analysis will address the second and third elements (40 vehicles added to an intersection and left-turn queue exceeds existing storage length).

ELEMENT 2 – 40 VEHICLES ADDED TO A STUDY INTERSECTION

Table 1 summarizes the number of project-generated trips forecast to be added at each study intersection within City of Signal Hill jurisdiction during the morning, school afternoon, and evening peak hours. Non-City of Signal Hill intersections are omitted since this threshold only applies to City of Signal Hill. The proposed project is forecast to contribute 40 or more peak hour trips at the following study intersections:

Orange Avenue (NS) at Willow Street (EW) - #2
This signalized intersection is forecast to operate at Level of Service F during the evening peak hour for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

Orange Avenue (NS) at Burnett Street (EW) - #3
This signalized intersection is forecast to operate at Level of Service C during the peak hours for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

Orange Avenue (NS) at Hill Street (EW) - #4
This signalized intersection is forecast to operate at Level of Service D or better during the peak hours for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

Gundry Avenue (NS) at Hill Street (EW) - #6
This unsignalized intersection is forecast to operate at Level of Service C or better during the peak hours for General Plan Buildout Without and With Project conditions. A traffic signal is not forecast to be warranted based on the peak hour volume traffic signal warrant (see Appendix B.)

Proposed Mitigation: N/A. Since the unsignalized intersection is forecast to operate within acceptable Level of Service and the peak hour traffic signal warrant is not satisfied, the project impact is considered less than significant and no mitigation is required.

Walnut Avenue (NS) at Hill Street (EW) - #10
This unsignalized intersection is forecast to operate at Level of Service C during the morning/evening peak hours and Level of Service E during the school afternoon peak hour only; however, a traffic signal is not forecast to be warranted (see Appendix B). As previously noted in the Supplemental Afternoon School Peak Hour Analysis (Kunzman Associates, Inc, May 31, 2018), extending the parking restriction on the northbound approach would effectively allow for operation of a right turn lane.

Proposed Mitigation: Extend the no parking restriction on the northbound approach to 100 feet south of the intersection. This will result in the loss of approximately two on-street parking spaces, but will allow for a de facto right turn lane.

Gaviota Avenue (NS) at Hill Street (EW) - #13
This unsignalized intersection is forecast to operate at Level of Service B during the peak hours for General Plan Buildout Without and With Project conditions A traffic signal is not forecast to be warranted based on the peak hour volume traffic signal warrant (see Appendix B.)

Proposed Mitigation: N/A. Since the unsignalized intersection is forecast to operate within acceptable Level of Service and the peak hour traffic signal warrant is not satisfied, the project impact is considered less than significant and no mitigation is required.

Cherry Avenue (NS) at Willow Street (EW) - #15
This signalized intersection is forecast to operate at Level of Service F during the evening peak hour for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

Cherry Avenue (NS) at Burnett Street (EW) - #16
This signalized intersection is forecast to operate at Level of Service C during the peak hours for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

Cherry Avenue (NS) at Hill Street (EW) - #17
This signalized intersection is forecast to operate at Level of Service C during the peak hours for General Plan Buildout Without and With Project conditions and did not previously meet the significant impact threshold related to drop in ICU.

Proposed Mitigation: Update signal timing as needed.

ELEMENT 3 – LEFT-TURN QUEUE EXCEEDS STORAGE LENGTH

Table 2 summarizes the existing left-turn storage lengths and the corresponding queue length during the morning, school afternoon (where applicable), and evening peak hours for study intersections within City of Signal Hill jurisdiction where the project is forecast to add trips to the left turn movement. Non-City of Signal Hill intersections are omitted since this threshold only applies to City of Signal Hill. The queue length was calculated in accordance with the Highway Capacity Manual, 6th Edition back of queue methodology for the 95th-percentile queue length. Queue worksheets are provided in Appendix C.

As shown in Table 2, adequate left-turn storage is forecast to be provided at the City of Signal Hill study intersections where the proposed project is forecast to increase the left-turn volume during the peak hours for Opening Year (2020) With Project conditions.

As also shown in Table 2, adequate left-turn storage is forecast to be provided at the City of Signal Hill study intersections where the proposed project is forecast to increase the left-turn volume during the peak hours for General Plan Buildout (Year 2040) With Project conditions, with exception of the southbound left turn at Orange Avenue/Hill Street and the westbound left turn at Cherry Avenue/Willow Street.

Orange Avenue (NS) at Hill Street (EW) - #4
Southbound left-turn storage length is forecast to be exceeded during the morning peak hour for General Plan Buildout (Year 2040) With Project conditions. It should be noted that there is additional storage available within the painted median to accommodate the additional queue.

Proposed Mitigation: If necessary, extend the southbound left turn lane striping to provide 250 feet of storage length (including bay taper).

Cherry Avenue (NS) at Willow Street (EW) - #15
Westbound left-turn storage length is forecast to be exceeded during the evening peak hour for General Plan Buildout (Year 2040) With Project conditions. The existing left-turn lane storage is approximately 200 feet for dual left turn lanes plus a left-turn bay taper of approximately 120 feet.

Proposed Mitigation: Modify the westbound raised median to accommodate 250 feet of storage length for dual left turn lanes plus a left-turn bay taper of approximately 120 feet.

FAIR SHARE IMPROVEMENT COSTS

Figure 3 shows a summary of project fair share percentages at each of the intersection improvement locations. Fair share percentages were determined based on the following formula:

$$\text{Project Fair Share} = \text{Improvement Cost} \times \frac{\text{Project Trips}}{\text{New Traffic}\ (\text{Future Traffic} - \text{Existing Traffic})}$$

Table 4 shows the cost estimate for off-site improvements. These cost estimates are intended for informational purposes only and do not imply any legal responsibility or formula for contributions or mitigation. As shown in Table 4, the total project share of estimated off-site improvement costs is $6,016.

SUMMARY

The proposed project should contribute towards updated signal timing at the following study intersections:

- Orange Avenue (NS) at Willow Street (EW) - #2
- Orange Avenue (NS) at Burnett Street (EW) - #3
- Orange Avenue (NS) at Hill Street (EW) - #4
- Cherry Avenue (NS) at Willow Street (EW) - #15
- Cherry Avenue (NS) at Burnett Street (EW) - #16
- Cherry Avenue (NS) at Hill Street (EW) - #17

Additionally, the project should contribute towards its share of costs for the following improvements:

Orange Avenue (NS) at Hill Street (EW) - #4
If necessary, extend the southbound left turn lane striping to provide 250 feet of storage length (including bay taper).

Mr. Steven Christie
SIGNAL HILL XC, LLC
July 5, 2019

Walnut Avenue (NS) at Hill Street (EW) - #10
Extend the no parking restriction on the northbound approach to 100 feet south of the intersection. This will result in the loss of approximately two on-street parking spaces, but will allow for a de facto right turn lane.

Cherry Avenue (NS) at Willow Street (EW) - #15
Modify the westbound raised median to accommodate 250 feet of storage length for dual left turn lanes plus a left-turn bay taper of approximately 120 feet.

CONCLUSION

We appreciate the opportunity to assist you on this project. Should you have any questions or if we can be of further assistance, please do not hesitate to call at (714) 795-3100.

Sincerely,

Giancarlo Ganddini, PE, PTP
Principal



Table 1
Project Trip Contribution

ID	Study Intersection	Jurisdiction[1]	Peak Hour Project Trips		40 or More Trips Added?	Mitigation Required?
			Morning	School PM/ Evening		
1.	Orange Ave at Spring St	SH/LB	36	37	No	No
2.	Orange Ave at Willow St	SH/LB	60	62	Yes	Yes - update signal timing.
3.	Orange Ave at Burnett St	SH	60	62	Yes	Yes - update signal timing.
4.	Orange Ave at Hill St	SH/LB	69	71	Yes	Yes - update signal timing.
6.	Gundry Ave at Hill St	SH	71	72	Yes	No[2]
7.	Walnut Ave at Spring St	SH/LB	9	9	No	No
8.	Walnut Ave at Willow St	SH	9	9	No	No
9.	Walnut Ave at Burnett St	SH	9	9	No	No
10.	Walnut Ave at Hill St	SH	95	93	Yes	Yes - update signal timing.
13.	Gaviota Ave at Hill St	SH	64	62	Yes	No[2]
14.	Cherry Ave at Spring St	SH/LB	28	29	No	No
15.	Cherry Ave at Willow St	SH	79	78	Yes	Yes - update signal timing.
16.	Cherry Ave at Burnett St	SH	79	78	Yes	Yes - update signal timing.
17.	Cherry Ave at Hill St	SH	79	78	Yes	Yes - update signal timing.
18.	Cherry Ave at 21st St	SH	15	16	No	No
19.	Cherry Ave at 20th St	SH	0	0	No	No

Notes:

(1) SH = City of Signal Hill; LB = City of Long Beach

(2) Since the unsignalized intersection is forecast to operate within acceptable Level of Service and the peak hour traffic signal warrant is not satisfied, the project impact is considered less than significant and no mitigation is required.

Table 2
Left-Turn Lane Queue Lengths

ID	Study Intersection	Movement[1]	Storage Length[2]	Opening Year (2020) With Project			
				95th-Percentile Queue Length (Feet)			Adequate Storage Length?
				Morning	School PM	Evening	
2.	Orange Ave at Willow St	NBL	145+	46	n/a	47	Yes
4.	Orange Ave at Hill St	SBL	225+	219	84	86	Yes
14.	Cherry Ave at Spring St	WBL	215+	138	n/a	120	Yes
15.	Cherry Ave at Willow St	WBL	225	167	n/a	201	Yes

ID	Study Intersection	Movement[1]	Storage Length[2]	General Plan Buildout (Year 2040) With Project			
				95th-Percentile Queue Length (Feet)			Adequate Storage Length?
				Morning	School PM	Evening	
2.	Orange Ave at Willow St	NBL	145+	66	n/a	59	Yes
4.	Orange Ave at Hill St	SBL	225+	240	98	104	No
14.	Cherry Ave at Spring St	WBL	215+	162	n/a	140	Yes
15.	Cherry Ave at Willow St	WBL	225	195	n/a	276	No

Table 3
Project Fair Share Percentage

ID	Study Intersection	Peak Hour	Existing Volume	General Plan Buildout Volume	Total New Volume	Project Trips	Project % of New Traffic
2.	Orange Ave at Willow St	Morning	3,574	4,507	933	60	6.4%
		Evening	4,159	5,235	1,076	62	5.8%
3.	Orange Ave at Burnett St	Morning	1,537	1,999	462	60	13.0%
		Evening	1,521	1,988	467	62	13.3%
4.	Orange Ave at Hill St	Morning	1,742	2,260	518	69	13.3%
		School PM	1,683	2,195	512	71	13.9%
		Evening	1,641	2,142	501	71	14.2%
10.	Walnut Ave at Hill St	Morning	805	1,098	293	95	32.4%
		School PM	951	1,269	318	93	29.2%
		Evening	859	1,156	297	93	31.3%
15.	Cherry Ave at Willow St	Morning	4,989	6,283	1,294	79	6.1%
		Evening	5,804	7,286	1,482	78	5.3%
16.	Cherry Ave at Burnett St	Morning	2,609	3,311	702	79	11.3%
		Evening	2,852	3,611	759	78	10.3%
17.	Cherry Ave at Hill St	Morning	2,388	3,042	654	79	12.1%
		Evening	2,600	3,302	702	78	11.1%

Table 4
Cost Estimate and Project Fair Share

ID	Study Intersection	Improvement	Cost Estimate	Project % of New Traffic[1]	Project Fair Share of Cost
2.	Orange Ave at Willow St	- Update signal timing[2]	$ 5,000	6.4%	$ 322
3.	Orange Ave at Burnett St	- Update signal timing	$ 5,000	13.3%	$ 664
4.	Orange Ave at Hill St	- Update signal timing - Extend the southbound left turn lane striping to provide 250 feet of storage length (including bay taper).[3]	$ 5,000 $ 3,750	14.2%	$ 1,240
10.	Walnut Ave at Hill St	- Extend the no parking restriction on the northbound approach to 100 feet south of the intersection. This will result in the loss of approximately two on-street parking spaces, but will allow for a de facto right turn lane.	$ 1,500	32.4%	$ 486
15.	Cherry Ave at Willow St	- Update signal timing - Modify the westbound raised median to accommodate 250 feet of storage length for dual left turn lanes plus a left-turn bay taper of approximately 120 feet.[4]	$ 5,000 $ 30,000	6.1%	$ 2,137
16.	Cherry Ave at Burnett St	- Update signal timing	$ 5,000	11.3%	$ 563
17.	Cherry Ave at Hill St	- Update signal timing	$ 5,000	12.1%	$ 604
TOTAL			$ 65,250		$ 6,016

Notes:

(1) Based on greater of morning, school afternoon, or evening peak hour share from Table 3.

(2) Source: National Traffic Signal Report Card: Technical Report 2005, National Transportation Operations Coalition (http://www.ite.org/reportcard/NTS_TechReport.pdf)

(3) Cost to remove and add striping is estimated at $15 per linear foot.

(4) https://safety.fhwa.dot.gov/saferjourney1/Library/countermeasures/16.htm

APPENDIX A

GLOSSARY

GLOSSARY OF TERMS

ACRONYMS

AC	Acres
ADT	Average Daily Traffic
Caltrans	California Department of Transportation
DU	Dwelling Unit
ICU	Intersection Capacity Utilization
LOS	Level of Service
TSF	Thousand Square Feet
V/C	Volume/Capacity
VMT	Vehicle Miles Traveled

TERMS

AVERAGE DAILY TRAFFIC: The average 24-hour volume for a stated period divided by the number of days in that period. For example, Annual Average Daily Traffic is the total volume during a year divided by 365 days.

BANDWIDTH: The number of seconds of green time available for through traffic in a signal progression.

BOTTLENECK: A point of constriction along a roadway that limits the amount of traffic that can proceed downstream from its location.

CAPACITY: The maximum number of vehicles that can be reasonably expected to pass over a given section of a lane or a roadway in a given time period.

CHANNELIZATION: The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movements of both vehicles and pedestrians.

CLEARANCE INTERVAL: Nearly same as yellow time. If there is an all red interval after the end of a yellow, then that is also added into the clearance interval.

CONTROL DELAY: The component of delay, typically expressed in seconds per vehicle, resulting from the type of traffic control at an intersection. Control delay is measured by comparison with the uncontrolled condition; it includes delay incurred by slowing down, stopping/waiting, and speeding up.

CORDON: An imaginary line around an area across which vehicles, persons, or other items are counted (in and out).

CORNER SIGHT DISTANCE: The minimum sight distance required by the driver of a vehicle to cross or enter the lanes of the major roadway without requiring approaching traffic travelling at a given speed to radically alter their speed or trajectory. Corner sight distance is measured from the driver's eye at 42 inches above the pavement to an object height of 36 inches above the pavement in the center of the nearest approach lane.

CYCLE LENGTH: The time period in seconds required for a traffic signal to complete one full cycle of indications.

CUL-DE-SAC: A local street open at one end only and with special provisions for turning around.

DAILY CAPACITY: A theoretical value representing the daily traffic volume that will typically result in a peak hour volume equal to the capacity of the roadway.

DELAY: The time consumed while traffic is impeded in its movement by some element over which it has no control, usually expressed in seconds per vehicle.

DEMAND RESPONSIVE SIGNAL: Same as traffic-actuated signal.

DENSITY: The number of vehicles occupying in a unit length of the through traffic lanes of a roadway at any given instant. Usually expressed in vehicles per mile.

DETECTOR: A device that responds to a physical stimulus and transmits a resulting impulse to the signal controller.

DESIGN SPEED: A speed selected for purposes of design. Features of a highway, such as curvature, superelevation, and sight distance (upon which the safe operation of vehicles is dependent) are correlated to design speed.

DIRECTIONAL SPLIT: The percent of traffic in the peak direction at any point in time.

DIVERSION: The rerouting of peak hour traffic to avoid congestion.

FORCED FLOW: Opposite of free flow.

FREE FLOW: Volumes are well below capacity. Vehicles can maneuver freely and travel is unimpeded by other traffic.

GAP: Time or distance between successive vehicles in a traffic stream, rear bumper to front bumper.

HEADWAY: Time or distance spacing between successive vehicles in a traffic stream, front bumper to front bumper.

INTERCONNECTED SIGNAL SYSTEM: A number of intersections that are connected to achieve signal progression.

LEVEL OF SERVICE: A qualitative measure of a number of factors, which include speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs.

LOOP DETECTOR: A vehicle detector consisting of a loop of wire embedded in the roadway, energized by alternating current and producing an output circuit closure when passed over by a vehicle.

MINIMUM ACCEPTABLE GAP: Smallest time headway between successive vehicles in a traffic stream into which another vehicle is willing and able to cross or merge.

MULTI-MODAL: More than one mode; such as automobile, bus transit, rail rapid transit, and bicycle transportation modes.

OFFSET: The time interval in seconds between the beginning of green at one intersection and the beginning of green at an adjacent intersection.

PLATOON: A closely grouped component of traffic that is composed of several vehicles moving, or standing ready to move, with clear spaces ahead and behind.

PASSENGER CAR EQUIVALENT (PCE): A metric used to assess the impact of larger vehicles, such as trucks, recreational vehicles, and buses, by converting the traffic volume of larger vehicles to an equivalent number of passenger cars.

PEAK HOUR: The 60 consecutive minutes with the highest number of vehicles.

PRETIMED SIGNAL: A type of traffic signal that directs traffic to stop and go on a predetermined time schedule without regard to traffic conditions. Also, fixed time signal.

PROGRESSION: A term used to describe the progressive movement of traffic through several signalized intersections.

QUEUE: The number of vehicles waiting at a service area such as a traffic signal, stop sign, or access gate.

QUEUE LENGTH: The length of vehicle queue, typically expressed in feet, waiting at a service area such as a traffic signal, stop sign, or access gate.

SCREEN-LINE: An imaginary line or physical feature across which all trips are counted, normally to verify the validity of mathematical traffic models.

SHARED/RECIPROCAL PARKING AGREEMENT: A written binding document executed between property owners to provide a designated number of off-street parking stalls within a designated area to be available for specified businesses or land uses.

SIGHT DISTANCE: The continuous length of roadway visible to a driver or roadway user.

SIGNAL CYCLE: The time period in seconds required for one complete sequence of signal indications.

SIGNAL PHASE: The part of the signal cycle allocated to one or more traffic movements.

STACKING DISTANCE: The length of area available behind a service area, such as a traffic signal or gate, for vehicle queueing to occur.

STARTING DELAY: The delay experienced in initiating the movement of queued traffic from a stop to an average running speed through an intersection.

STOPPING SIGHT DISTANCE: The minimum distance required by the driver of a vehicle on the major roadway travelling at a given speed to bring the vehicle to a stop after an object on the road becomes visible. Stopping sight distance is measured from the driver's eye at 42 inches above the pavement to an object height of 6 inches above the pavement.

TRAFFIC-ACTUATED SIGNAL: A type of traffic signal that directs traffic to stop and go in accordance with the demands of traffic, as registered by the actuation of detectors.

TRIP: The movement of a person or vehicle from one location (origin) to another (destination). For example, from home to store to home is two trips, not one.

TRIP-END: One end of a trip at either the origin or destination (i.e., each trip has two trip-ends). A trip-end occurs when a person, object, or message is transferred to or from a vehicle.

TRIP GENERATION RATE: The quantity of trips produced and/or attracted by a specific land use stated in terms of units such as per dwelling, per acre, and per 1,000 square feet of floor space.

TRUCK: A vehicle having dual tires on one or more axles, or having more than two axles.

TURNING RADIUS: The circular arc formed by the smallest turning path radius of the front outside tire of a vehicle, such as that performed by a U-turn maneuver. This is based on the length and width of the wheel base as well as the steering mechanism of the vehicle.

UNBALANCED FLOW: Heavier traffic flow in one direction than the other. On a daily basis, most facilities have balanced flow. During the peak hours, flow is seldom balanced in an urban area.

VEHICLE MILES OF TRAVEL: A measure of the amount of usage of a section of highway, obtained by multiplying the average daily traffic by length of facility in miles.

APPENDIX B

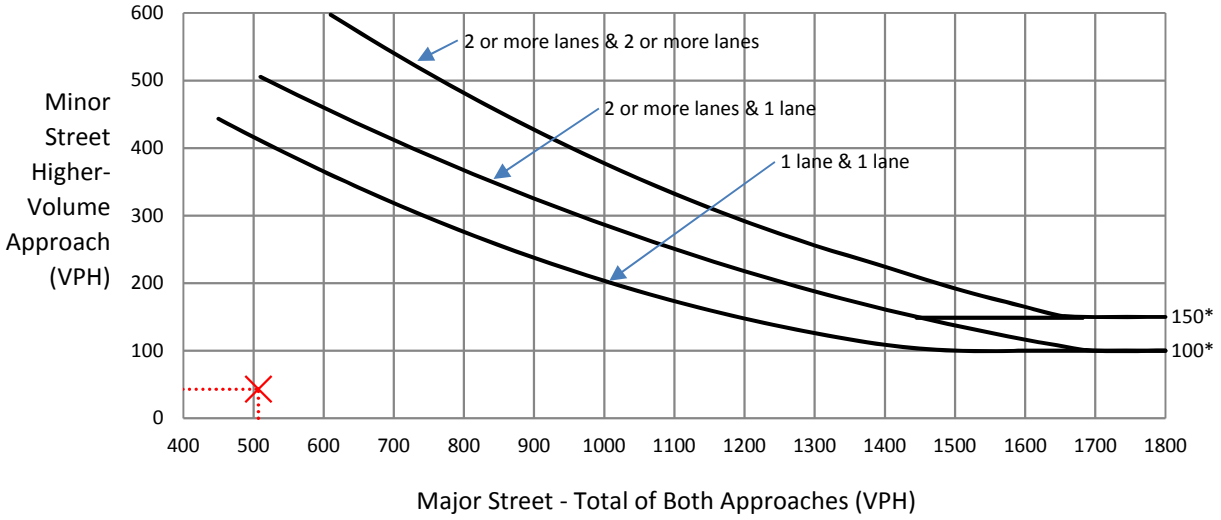
TRAFFIC SIGNAL WARRANT WORKSHEETS

Figure C-1

Gundry Ave (NS) / Hill St (EW) - #6
General Plan Buildout With Project
AM Peak Hour

Major Street:	Hill St	Volume:	507
Minor Street:	Gundry Ave	Volume:	43

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

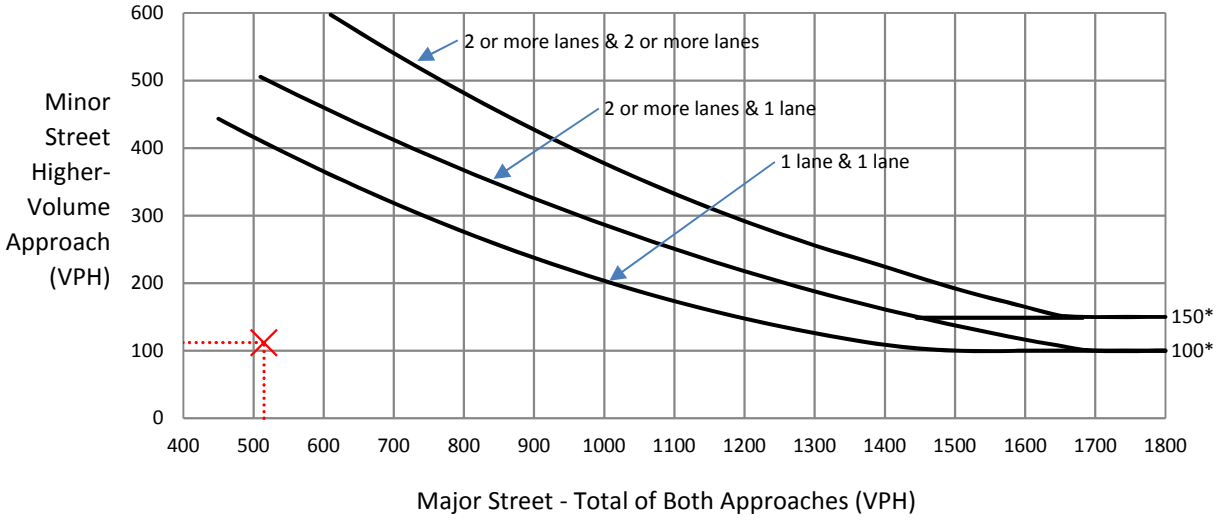
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-2

Gundry Ave (NS) / Hill St (EW) - #6
General Plan Buildout With Project
School PM Peak Hour

Major Street:	Hill St	Volume:	515
Minor Street:	Gundry Ave	Volume:	112

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

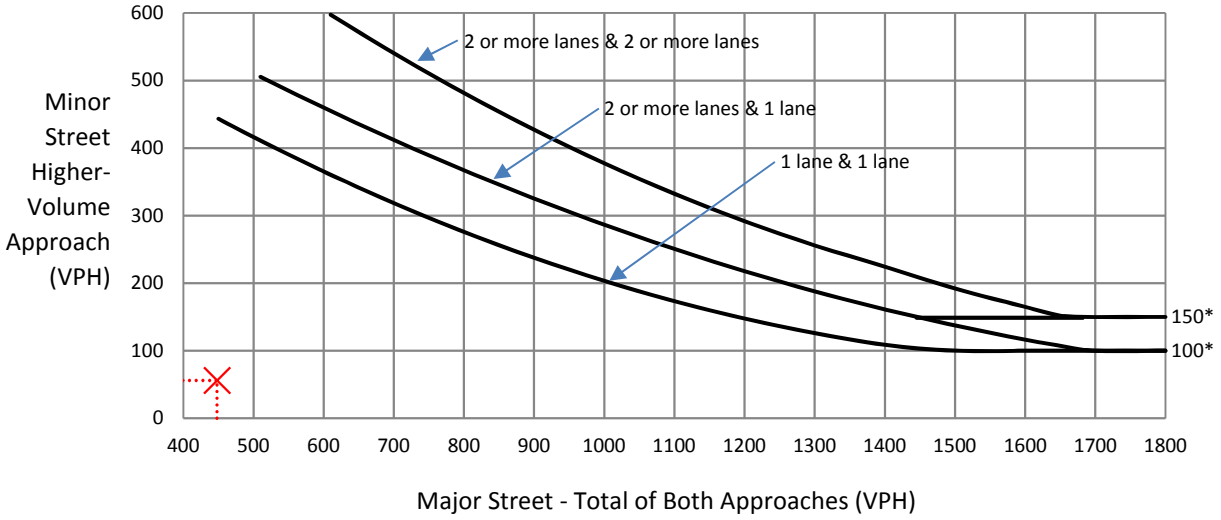
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-3

Gundry Ave (NS) / Hill St (EW) - #6
General Plan Buildout With Project
PM Peak Hour

Major Street:	Hill St	Volume:	448
Minor Street:	Gundry Ave	Volume:	56

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

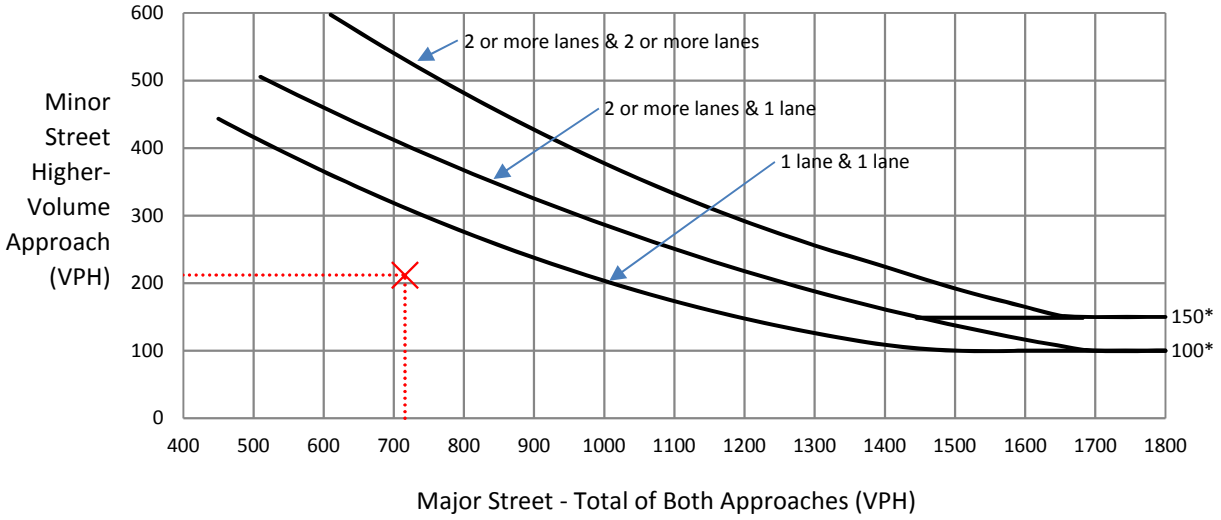
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-4

Walnut Ave (NS) / Hill St (EW) - #10
General Plan Buildout With Project
AM Peak Hour

Major Street:	Walnut Ave	Volume:	716
Minor Street:	Hill St	Volume:	212

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

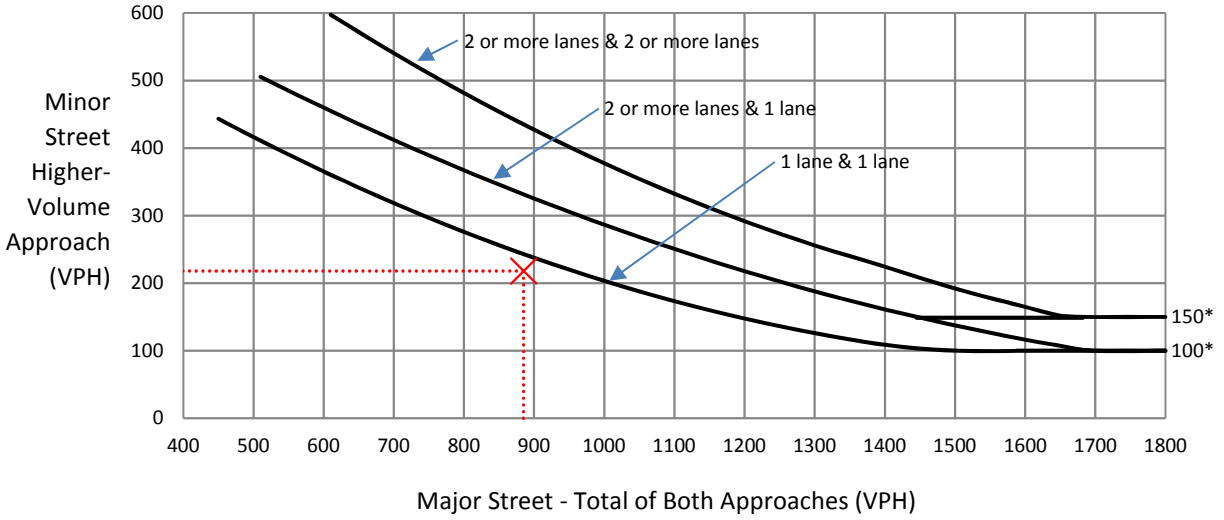
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-5

Walnut Ave (NS) / Hill St (EW) - #10
General Plan Buildout With Project
School PM Peak Hour

Major Street:	Walnut Ave	Volume:	885
Minor Street:	Hill St	Volume:	218

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

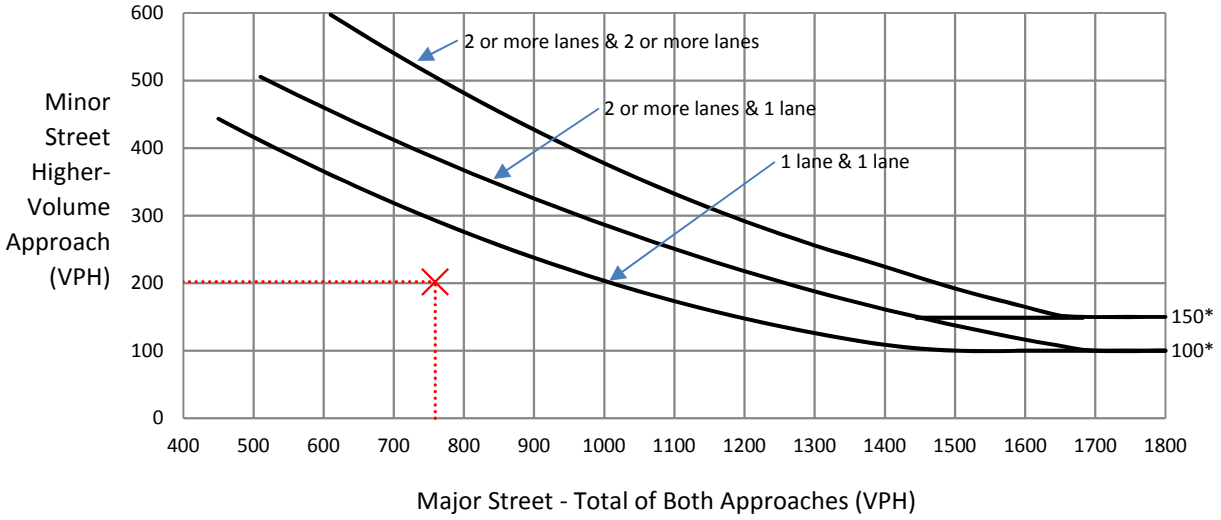
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-6

Walnut Ave (NS) / Hill St (EW) - #10
General Plan Buildout With Project
PM Peak Hour

Major Street:	Walnut Ave	Volume:	759
Minor Street:	Hill St	Volume:	202

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

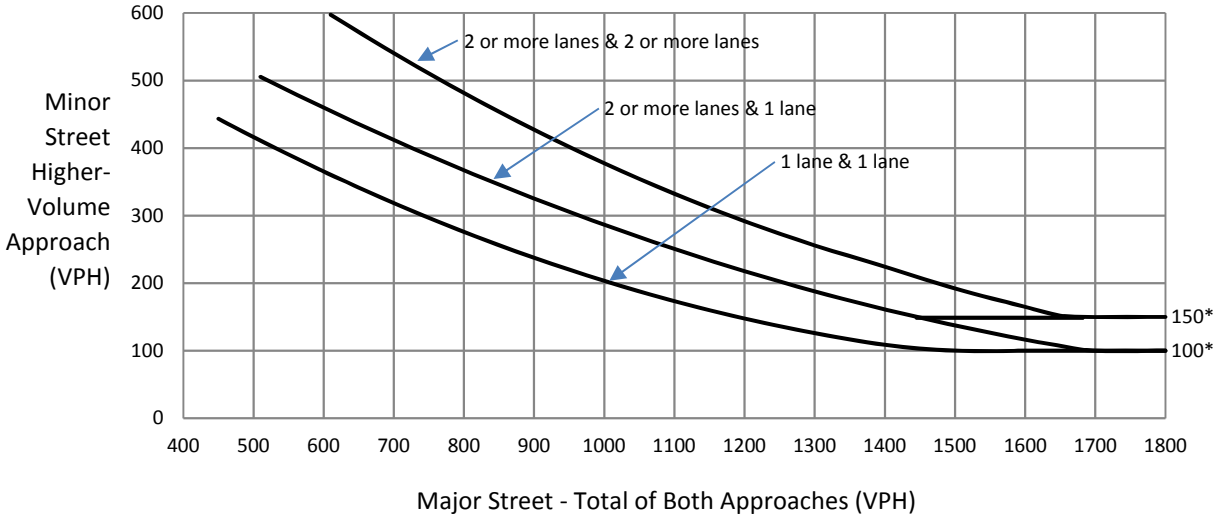
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-7

Gaviota Ave (NS) / Hill St (EW) - #13
General Plan Buildout With Project
AM Peak Hour

Major Street:	Hill St	Volume:	374
Minor Street:	Gaviota Ave	Volume:	45

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

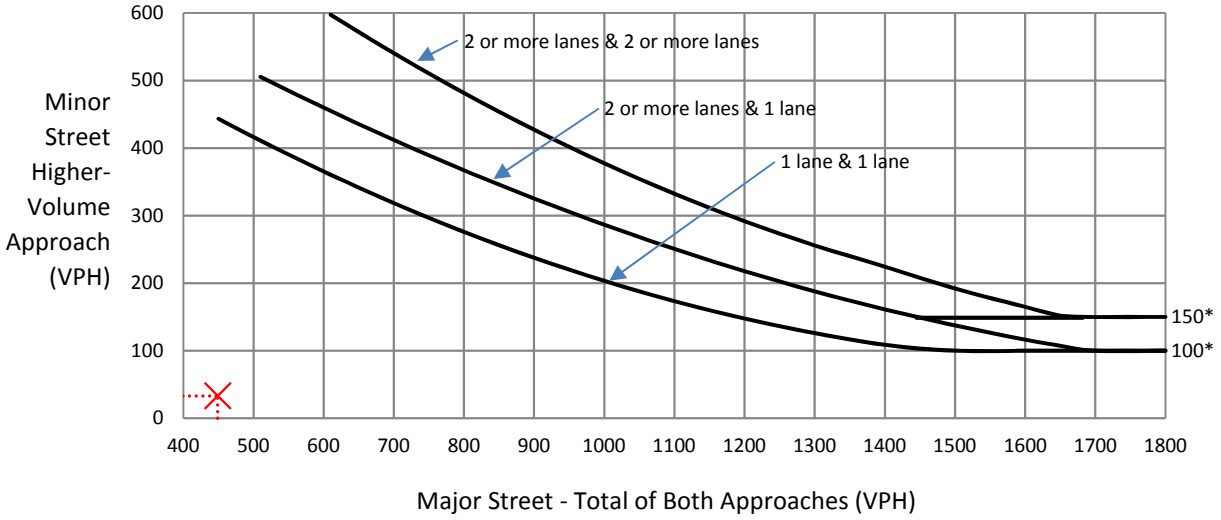
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure C-8

Gaviota Ave (NS) / Hill St (EW) - #13
General Plan Buildout With Project
PM Peak Hour

Major Street:	Hill St	Volume:	449
Minor Street:	Gaviota Ave	Volume:	33

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

APPENDIX C

HCM QUEUE LENGTH WORKSHEETS

Opening Year (2020) With Project

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	32.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.625

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	82	492	92	40	439	83	84	931	72	69	1128	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	12	0	8	36	2	4	30	21	0	16	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	514	94	49	484	87	90	980	94	70	1167	76
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	129	24	12	121	22	23	245	24	18	292	19
Total Analysis Volume [veh/h]	89	514	94	49	484	87	90	980	94	70	1167	76
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	31	0	11	31	0	31	46	0	12	27	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	55	45	55	44	44	7	27	27	6	27	27
g / C, Green / Cycle	0.55	0.45	0.55	0.44	0.44	0.07	0.27	0.27	0.06	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.08	0.27	0.05	0.25	0.05	0.05	0.20	0.20	0.04	0.23	0.23
s, saturation flow rate [veh/h]	1064	1900	1023	1900	1615	1810	3618	1816	1810	3618	1841
c, Capacity [veh/h]	502	858	473	836	710	119	993	498	110	975	496
d1, Uniform Delay [s]	13.14	20.64	13.07	21.08	16.61	45.99	32.85	32.87	45.92	34.58	34.59
k, delay calibration	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.77	3.08	0.09	2.92	0.35	9.35	1.00	1.99	5.89	2.10	4.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.18	0.60	0.10	0.58	0.12	0.76	0.72	0.72	0.63	0.84	0.84
d, Delay for Lane Group [s/veh]	13.91	23.72	13.17	24.01	16.96	55.34	33.85	34.86	51.81	36.69	38.71
Lane Group LOS	B	C	B	C	B	E	C	C	D	D	D
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.02	9.42	0.50	8.90	1.23	2.50	7.84	8.03	1.87	9.58	10.03
50th-Percentile Queue Length [ft/ln]	25.50	235.41	12.59	222.39	30.83	62.42	195.98	200.64	46.81	239.46	250.80
95th-Percentile Queue Length [veh/ln]	1.84	14.45	0.91	13.79	2.22	4.49	12.43	12.67	3.37	14.65	15.23
95th-Percentile Queue Length [ft/ln]	45.90	361.22	22.65	344.68	55.50	112.36	310.78	316.79	84.25	366.35	380.67

Movement, Approach, & Intersection Results

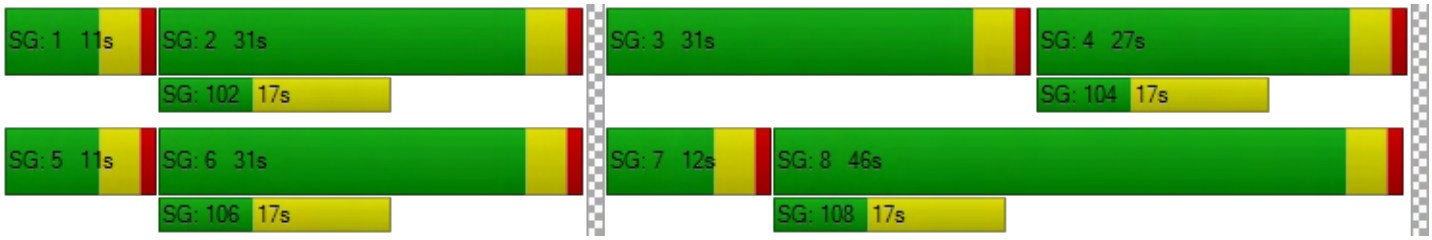
d_M, Delay for Movement [s/veh]	13.91	23.72	0.00	13.17	24.01	16.96	55.34	34.13	34.86	51.81	37.28	38.71
Movement LOS	B	C		B	C	B	E	C	C	D	D	D
d_A, Approach Delay [s/veh]	22.27			22.16			35.83			38.14		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	32.15											
Intersection LOS	C											
Intersection V/C	0.625											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.549	2.558	3.006	2.958
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	540	540	840	460
d_b, Bicycle Delay [s]	26.65	26.65	16.82	29.65
l_b,int, Bicycle LOS Score for Intersection	2.555	2.583	2.200	2.282
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	341.3
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	3.755

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	40	667	22	28	526	25	78	90	38	47	124	57
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	3	54	19	9	6	9	0	4	2	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	41	695	25	83	556	35	86	101	39	52	128	71
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	174	6	21	139	9	22	25	10	13	32	18
Total Analysis Volume [veh/h]	41	695	25	83	556	35	86	101	39	52	128	71
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	24	0	0	24	0	0	76	0	0	76	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	20	20	20	20	72	72	72	72
g / C, Green / Cycle	0.20	0.20	0.20	0.20	0.72	0.72	0.72	0.72
(v / s)_i Volume / Saturation Flow Rate	0.05	0.38	0.11	0.31	3.00	0.02	1.38	0.04
s, saturation flow rate [veh/h]	839	1888	744	1880	62	1615	130	1615
c, Capacity [veh/h]	72	381	72	379	97	1160	140	1160
d1, Uniform Delay [s]	50.00	39.92	50.00	39.92	32.94	4.06	37.36	4.15
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	28.63	410.77	153.09	264.12	449.81	0.01	171.35	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.57	1.89	1.15	1.56	1.92	0.03	1.28	0.06
d, Delay for Lane Group [s/veh]	78.63	450.69	203.09	304.04	482.74	4.08	208.71	4.17
Lane Group LOS	E	F	F	F	F	A	F	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	1.59	52.65	4.86	36.99	13.11	0.20	8.83	0.37
50th-Percentile Queue Length [ft/ln]	39.86	1316.37	121.42	924.65	327.80	5.01	220.86	9.30
95th-Percentile Queue Length [veh/ln]	2.87	81.97	8.74	56.86	23.60	0.36	15.90	0.67
95th-Percentile Queue Length [ft/ln]	71.75	2049.37	218.55	1421.53	590.04	9.01	397.55	16.75

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	78.63	450.69	450.69	203.09	304.04	304.04	482.74	482.74	4.08	208.71	208.71	4.17
Movement LOS	E	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	430.64			291.61			400.14			150.85		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	341.30											
Intersection LOS	F											
Intersection V/C	3.755											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.553	2.630	2.143	2.213
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	400	400	1440	1440
d_b, Bicycle Delay [s]	32.00	32.00	3.92	3.92
l_b,int, Bicycle LOS Score for Intersection	2.815	2.672	1.933	1.974
Bicycle LOS	C	B	A	A

Sequence

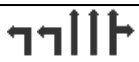
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Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	33.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.685

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	86	1069	170	281	1098	137	120	544	75	105	1052	358
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	21	1	0	46	0	0	1	8	5	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	90	1111	174	287	1166	140	122	556	85	112	1074	365
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	278	44	72	292	35	31	139	21	28	269	91
Total Analysis Volume [veh/h]	90	1111	174	287	1166	140	122	556	85	112	1074	365
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	23	39	0	17	33	0	13	21	0	23	31	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	39	39	13	45	45	8	24	24	8	24	24	24
g / C, Green / Cycle	0.06	0.39	0.39	0.13	0.45	0.45	0.08	0.24	0.24	0.08	0.24	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.05	0.24	0.24	0.11	0.24	0.24	0.07	0.12	0.12	0.06	0.20	0.20	0.20
s, saturation flow rate [veh/h]	1810	3618	1771	2663	3618	1798	1810	3618	1775	1810	3618	1867	1615
c, Capacity [veh/h]	118	1418	694	338	1640	815	153	875	429	144	857	442	383
d1, Uniform Delay [s]	46.02	24.30	24.30	42.79	19.71	19.71	45.00	32.65	32.71	45.22	36.57	36.57	36.57
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.21	0.21
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.56	1.95	3.94	5.98	1.24	2.48	9.15	0.43	0.89	8.69	2.58	9.02	10.29
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.76	0.61	0.61	0.85	0.53	0.53	0.80	0.49	0.50	0.78	0.86	0.86	0.86
d, Delay for Lane Group [s/veh]	55.58	26.25	28.24	48.76	20.95	22.20	54.16	33.07	33.60	53.90	39.15	45.58	46.86
Lane Group LOS	E	C	C	D	C	C	D	C	C	D	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.50	8.32	8.53	3.72	7.35	7.59	3.34	4.46	4.51	3.06	8.72	9.80	8.61
50th-Percentile Queue Length [ft/ln]	62.58	207.98	213.31	93.05	183.83	189.83	83.56	111.53	112.71	76.49	218.1	244.9	215.3
95th-Percentile Queue Length [veh/ln]	4.51	13.05	13.32	6.70	11.80	12.11	6.02	7.93	7.99	5.51	13.57	14.93	13.43
95th-Percentile Queue Length [ft/ln]	112.64	326.23	333.08	167.50	295.01	302.81	150.40	198.13	199.76	137.6	339.2	373.2	335.7

Movement, Approach, & Intersection Results

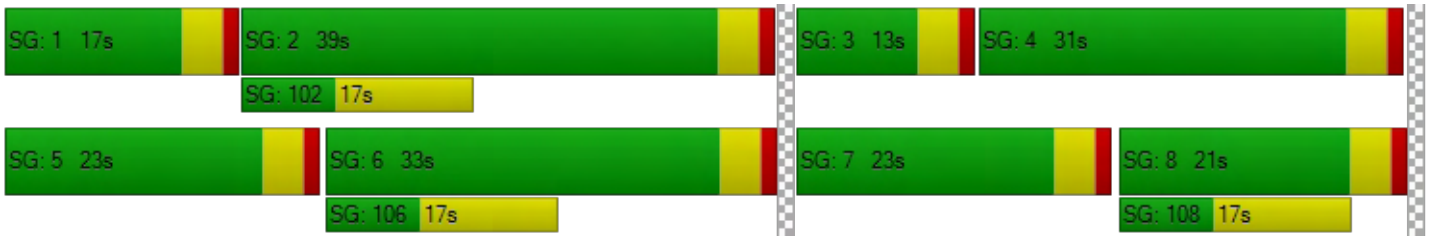
d_M, Delay for Movement [s/veh]	55.58	26.70	28.24	48.76	21.26	22.20	54.16	33.19	33.60	53.90	41.19	46.84
Movement LOS	E	C	C	D	C	C	D	C	C	D	D	D
d_A, Approach Delay [s/veh]	28.78			26.30			36.59			43.41		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	33.46											
Intersection LOS	C											
Intersection V/C	0.685											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	0.00	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.064	0.000	2.887	3.043
Crosswalk LOS	C	F	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	700	580	340	540
d_b, Bicycle Delay [s]	21.13	25.21	34.45	26.65
l_b,int, Bicycle LOS Score for Intersection	2.316	2.436	1.979	2.413
Bicycle LOS	B	B	A	B

Sequence

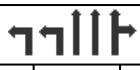
Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	35.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.643

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	167	1031	161	149	765	147	177	836	85	231	1124	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	24	28	31	0	1	28	0	51	10	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	170	1067	188	180	811	150	182	881	87	287	1156	126
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	43	267	47	45	203	38	46	220	22	72	289	32
Total Analysis Volume [veh/h]	170	1067	188	180	811	150	182	881	87	287	1156	126
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	33	41	41	13	21	0	13	29	0	17	33	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	40	57	9	37	37	9	23	23	13	27	27
g / C, Green / Cycle	0.11	0.40	0.57	0.09	0.37	0.37	0.09	0.23	0.23	0.13	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.09	0.21	0.12	0.07	0.18	0.18	0.07	0.18	0.18	0.11	0.24	0.24
s, saturation flow rate [veh/h]	1810	5176	1615	2663	3618	1752	2663	3618	1814	2663	3618	1806
c, Capacity [veh/h]	208	2077	918	231	1350	654	233	814	408	339	957	478
d1, Uniform Delay [s]	43.28	22.61	10.55	44.78	23.96	23.98	44.75	36.60	36.61	42.75	35.47	35.47
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.15	0.11	0.11	0.30
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.64	0.91	0.50	5.60	1.22	2.52	5.62	1.78	4.95	5.87	3.19	14.41
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	0.51	0.20	0.78	0.48	0.48	0.78	0.79	0.79	0.85	0.89	0.89
d, Delay for Lane Group [s/veh]	50.92	23.52	11.06	50.38	25.18	26.50	50.36	38.38	41.57	48.63	38.66	49.88
Lane Group LOS	D	C	B	D	C	C	D	D	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	4.52	6.34	2.07	2.35	5.95	6.03	2.38	7.51	7.91	3.72	10.25	11.72
50th-Percentile Queue Length [ft/ln]	112.96	158.40	51.70	58.82	148.76	150.67	59.47	187.75	197.72	92.91	256.15	293.06
95th-Percentile Queue Length [veh/ln]	8.00	10.46	3.72	4.23	9.95	10.05	4.28	12.00	12.52	6.69	15.50	17.34
95th-Percentile Queue Length [ft/ln]	200.11	261.61	93.07	105.87	248.77	251.32	107.05	300.11	313.02	167.24	387.39	433.43

Movement, Approach, & Intersection Results

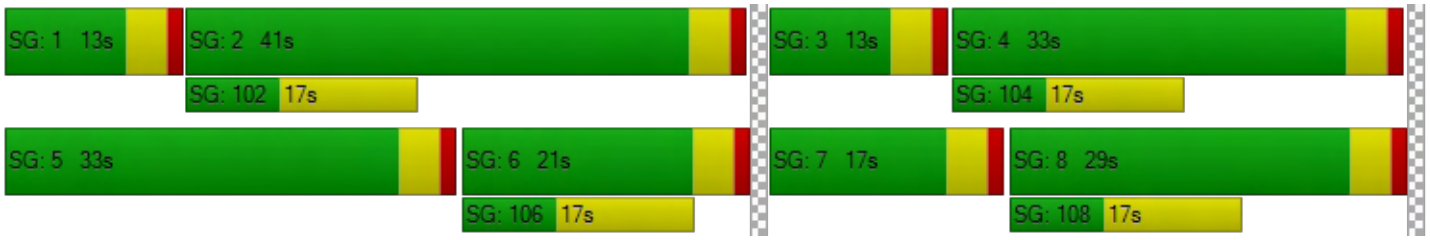
d_M, Delay for Movement [s/veh]	50.92	23.52	11.06	50.38	25.44	26.50	50.36	39.24	41.57	48.63	41.58	49.88
Movement LOS	D	C	B	D	C	C	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	25.14			29.52			41.17			43.54		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	35.04											
Intersection LOS	D											
Intersection V/C	0.643											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.048	3.037	3.050	3.074
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	740	340	500	580
d_b, Bicycle Delay [s]	19.85	34.45	28.13	25.21
l_b,int, Bicycle LOS Score for Intersection	2.343	2.187	2.192	2.423
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	287.3
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	3.064

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	20	16	5	11	3	0	3	8	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	598	45	46	580	45	70	82	42	65	141	94
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	150	11	12	145	11	18	21	11	16	35	24
Total Analysis Volume [veh/h]	50	598	45	46	580	45	70	82	42	65	141	94
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	25	0	0	25	0	0	75	0	0	75	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	21	21	71	71	71	71
g / C, Green / Cycle	0.21	0.21	0.21	0.21	0.71	0.71	0.71	0.71
(v / s)_i Volume / Saturation Flow Rate	0.06	0.34	0.06	0.33	2.42	0.03	1.77	0.06
s, saturation flow rate [veh/h]	813	1877	799	1876	63	1615	116	1615
c, Capacity [veh/h]	72	397	72	397	97	1144	130	1144
d1, Uniform Delay [s]	50.00	39.42	50.00	39.42	32.40	4.36	36.39	4.51
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	43.11	290.16	36.10	270.50	297.75	0.01	297.10	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.69	1.62	0.64	1.57	1.56	0.04	1.59	0.08
d, Delay for Lane Group [s/veh]	93.11	329.58	86.10	309.92	330.15	4.38	333.49	4.54
Lane Group LOS	F	F	F	F	F	A	F	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.11	41.59	1.87	39.41	8.98	0.23	12.60	0.53
50th-Percentile Queue Length [ft/ln]	52.69	1039.71	46.69	985.16	224.45	5.70	315.12	13.20
95th-Percentile Queue Length [veh/ln]	3.79	64.10	3.36	60.58	16.16	0.41	22.69	0.95
95th-Percentile Queue Length [ft/ln]	94.84	1602.61	84.04	1514.56	404.00	10.26	567.22	23.76

Movement, Approach, & Intersection Results

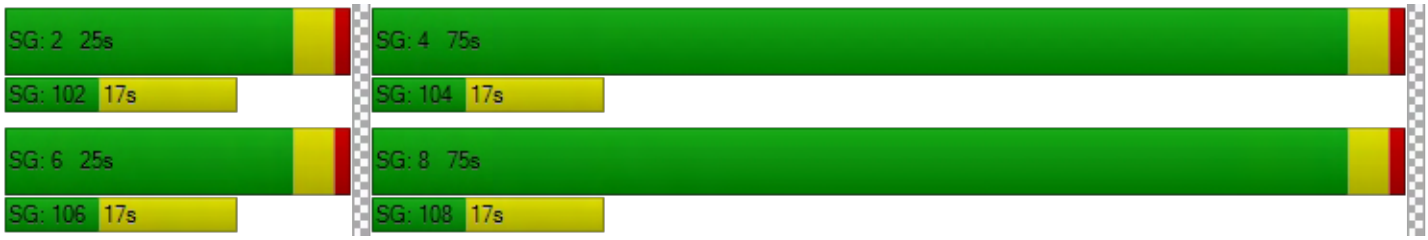
d_M, Delay for Movement [s/veh]	93.11	329.58	329.58	86.10	309.92	309.92	330.15	330.15	4.38	333.49	333.49	4.54
Movement LOS	F	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	312.52			294.58			259.62			230.42		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	287.26											
Intersection LOS	F											
Intersection V/C	3.064											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.565	2.585	2.156	2.164
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	420	420	1420	1420
d_b, Bicycle Delay [s]	31.21	31.21	4.21	4.21
l_b,int, Bicycle LOS Score for Intersection	2.703	2.667	1.880	2.055
Bicycle LOS	B	B	A	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	33.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.743

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	460	101	73	500	67	89	1451	74	135	1077	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	19	34	0	16	17	5	3	22	8	0	29	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	71	503	103	90	527	73	94	1502	83	138	1128	91
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	126	26	23	132	18	24	376	21	35	282	23
Total Analysis Volume [veh/h]	71	503	103	90	527	73	94	1502	83	138	1128	91
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	21	0	11	21	0	22	54	0	14	46	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	45	34	45	35	35	7	34	34	9	37	37
g / C, Green / Cycle	0.45	0.34	0.45	0.35	0.35	0.07	0.34	0.34	0.09	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.07	0.26	0.08	0.28	0.05	0.05	0.29	0.29	0.08	0.22	0.22
s, saturation flow rate [veh/h]	1058	1900	1082	1900	1615	1810	3618	1849	1810	3618	1828
c, Capacity [veh/h]	349	646	368	654	556	123	1233	630	170	1327	671
d1, Uniform Delay [s]	19.68	29.65	19.52	29.81	22.56	45.87	30.63	30.64	44.50	25.87	25.87
k, delay calibration	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.15	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.31	8.96	0.34	10.24	0.49	9.39	1.75	4.57	8.92	0.46	0.90
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.20	0.78	0.24	0.81	0.13	0.76	0.85	0.85	0.81	0.61	0.61
d, Delay for Lane Group [s/veh]	20.99	38.61	19.87	40.04	23.05	55.26	32.38	35.22	53.42	26.32	26.77
Lane Group LOS	C	D	B	D	C	E	C	D	D	C	C
Critical Lane Group	Yes	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.05	12.16	1.22	13.03	1.25	2.61	11.70	12.47	3.75	7.76	7.93
50th-Percentile Queue Length [ft/ln]	26.30	304.03	30.50	325.69	31.16	65.13	292.60	311.80	93.87	194.12	198.34
95th-Percentile Queue Length [veh/ln]	1.89	17.88	2.20	18.95	2.24	4.69	17.31	18.26	6.76	12.33	12.55
95th-Percentile Queue Length [ft/ln]	47.34	447.01	54.91	473.67	56.09	117.23	432.87	456.60	168.97	308.37	313.82

Movement, Approach, & Intersection Results

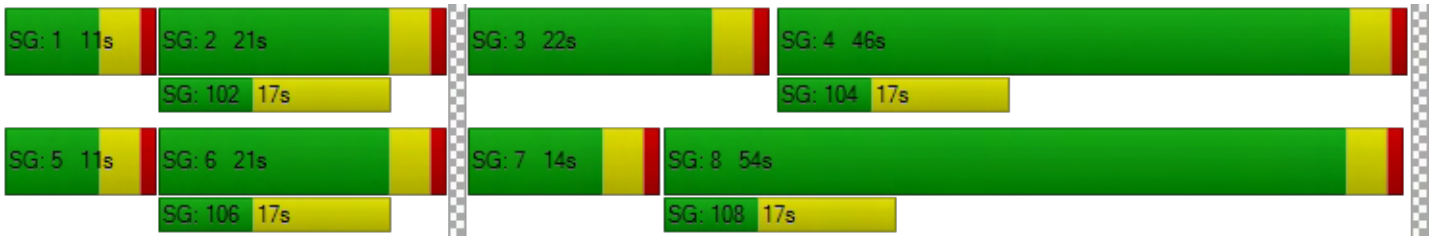
d_M, Delay for Movement [s/veh]	20.99	38.61	0.00	19.87	40.04	23.05	55.26	33.24	35.22	53.42	26.45	26.77
Movement LOS	C	D		B	D	C	E	C	D	D	C	C
d_A, Approach Delay [s/veh]	36.43			35.61			34.57			29.21		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	33.29											
Intersection LOS	C											
Intersection V/C	0.743											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.562	2.573	3.047	3.056
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	340	340	1000	840
d_b, Bicycle Delay [s]	34.45	34.45	12.50	16.82
l_b,int, Bicycle LOS Score for Intersection	2.507	2.698	2.483	2.306
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	98.5
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.594

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	31	563	33	27	592	43	36	107	30	42	103	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	20	16	5	11	3	0	3	8	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	597	37	48	620	49	48	112	31	46	113	83
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	149	9	12	155	12	12	28	8	12	28	21
Total Analysis Volume [veh/h]	32	597	37	48	620	49	48	112	31	46	113	83
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	34	0	0	34	0	0	66	0	0	66	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	31	31	31	31	61	61	61	61
g / C, Green / Cycle	0.31	0.31	0.31	0.31	0.61	0.61	0.61	0.61
(v / s)_i Volume / Saturation Flow Rate	0.04	0.34	0.06	0.36	1.08	0.02	1.02	0.05
s, saturation flow rate [veh/h]	780	1881	806	1876	148	1615	156	1615
c, Capacity [veh/h]	74	607	76	605	135	965	140	965
d1, Uniform Delay [s]	49.99	33.86	49.98	33.86	32.95	8.27	33.35	8.55
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	17.42	48.64	33.26	68.73	134.15	0.01	117.88	0.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.43	1.04	0.63	1.10	1.18	0.03	1.14	0.09
d, Delay for Lane Group [s/veh]	67.41	82.50	83.24	102.60	167.10	8.28	151.23	8.59
Lane Group LOS	E	F	F	F	F	A	F	A
Critical Lane Group	No	No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	1.15	22.73	1.90	26.05	7.05	0.26	6.70	0.71
50th-Percentile Queue Length [ft/ln]	28.85	568.15	47.51	651.15	176.37	6.43	167.44	17.82
95th-Percentile Queue Length [veh/ln]	2.08	31.43	3.42	36.69	12.64	0.46	11.87	1.28
95th-Percentile Queue Length [ft/ln]	51.93	785.85	85.52	917.17	315.98	11.58	296.64	32.07

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	67.41	82.50	82.50	83.24	102.60	102.60	167.10	167.10	8.28	151.23	151.23	8.59
Movement LOS	E	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	81.78			101.30			141.32			102.31		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	98.48											
Intersection LOS	F											
Intersection V/C	1.594											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.534	2.556	2.116	2.156
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	600	600	1240	1240
d_b, Bicycle Delay [s]	24.50	24.50	7.22	7.22
l_b,int, Bicycle LOS Score for Intersection	2.659	2.743	1.875	1.959
Bicycle LOS	B	B	A	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	32.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.662

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	1170	144	228	1250	109	155	916	128	93	656	368
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	43	5	0	28	0	0	2	4	2	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	108	1236	152	233	1303	111	158	936	135	97	670	375
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	309	38	58	326	28	40	234	34	24	168	94
Total Analysis Volume [veh/h]	108	1236	152	233	1303	111	158	936	135	97	670	375
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	17	24	0	14	21	0	15	21	0	41	47	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	43	43	10	46	46	11	24	24	7	20	20	20
g / C, Green / Cycle	0.08	0.43	0.43	0.10	0.46	0.46	0.10	0.24	0.24	0.07	0.20	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.06	0.26	0.26	0.09	0.26	0.26	0.09	0.20	0.20	0.05	0.15	0.15	0.15
s, saturation flow rate [veh/h]	1810	3618	1795	2663	3618	1825	1810	3618	1780	1810	3618	1745	1615
c, Capacity [veh/h]	139	1559	774	268	1646	830	191	861	424	128	735	354	328
d1, Uniform Delay [s]	45.41	21.80	21.80	44.38	20.08	20.09	43.90	36.27	36.28	45.70	37.38	37.41	37.43
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.10	1.68	3.35	8.44	1.44	2.84	8.81	2.20	4.38	8.85	1.45	3.02	3.29
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.78	0.59	0.59	0.87	0.57	0.57	0.83	0.83	0.83	0.76	0.74	0.74	0.74
d, Delay for Lane Group [s/veh]	54.51	23.48	25.16	52.82	21.53	22.93	52.71	38.47	40.67	54.55	38.83	40.42	40.72
Lane Group LOS	D	C	C	D	C	C	D	D	D	D	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.97	8.41	8.71	3.14	8.09	8.49	4.27	8.46	8.59	2.67	6.27	6.23	5.81
50th-Percentile Queue Length [ft/ln]	74.22	210.27	217.72	78.47	202.26	212.29	106.86	211.39	214.85	66.70	156.8	155.7	145.3
95th-Percentile Queue Length [veh/ln]	5.34	13.17	13.55	5.65	12.76	13.27	7.67	13.22	13.40	4.80	10.38	10.32	9.77
95th-Percentile Queue Length [ft/ln]	133.60	329.17	338.71	141.24	318.88	331.76	191.63	330.61	335.05	120.0	259.5	258.1	244.2

Movement, Approach, & Intersection Results

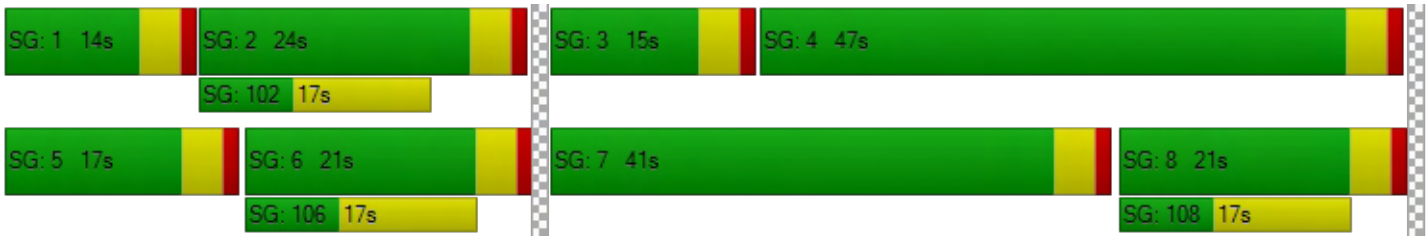
d_M, Delay for Movement [s/veh]	54.51	23.90	25.16	52.82	21.92	22.93	52.71	38.98	40.67	54.55	39.14	40.63
Movement LOS	D	C	C	D	C	C	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	26.24			26.36			40.93			40.93		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	32.59											
Intersection LOS	C											
Intersection V/C	0.662											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	0.00	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.100	0.000	2.894	3.030
Crosswalk LOS	C	F	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	400	340	340	860
d_b, Bicycle Delay [s]	32.00	34.45	34.45	16.25
l_b,int, Bicycle LOS Score for Intersection	2.382	2.465	2.236	2.188
Bicycle LOS	B	B	B	B

Sequence

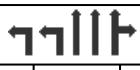
Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	38.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.801

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	166	835	219	303	980	183	211	1292	132	318	990	175
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	28	43	13	20	1	0	15	0	27	29	28
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	169	880	266	322	1020	188	215	1333	135	351	1039	207
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	220	67	81	255	47	54	333	34	88	260	52
Total Analysis Volume [veh/h]	169	880	266	322	1020	188	215	1333	135	351	1039	207
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	24	27	27	18	21	0	14	36	0	19	41	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	25	44	14	28	28	10	30	30	15	35	35
g / C, Green / Cycle	0.11	0.25	0.44	0.14	0.28	0.28	0.10	0.30	0.30	0.15	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.09	0.17	0.16	0.12	0.22	0.22	0.08	0.27	0.27	0.13	0.23	0.23
s, saturation flow rate [veh/h]	1810	5176	1615	2663	3618	1753	2663	3618	1812	2663	3618	1743
c, Capacity [veh/h]	205	1306	714	371	1007	488	266	1080	541	400	1261	608
d1, Uniform Delay [s]	43.40	33.72	18.64	42.18	33.65	33.66	44.14	33.77	33.79	41.66	27.68	27.68
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.34	0.11	0.11	0.19
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.97	2.79	1.49	6.20	6.98	13.48	5.80	3.22	16.04	6.31	0.61	2.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	0.67	0.37	0.87	0.81	0.81	0.81	0.91	0.91	0.88	0.67	0.67
d, Delay for Lane Group [s/veh]	51.37	36.51	20.13	48.38	40.64	47.14	49.94	36.99	49.83	47.97	28.29	29.85
Lane Group LOS	D	D	C	D	D	D	D	D	D	D	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.51	6.66	4.32	4.17	9.99	10.56	2.80	11.60	13.57	4.54	8.43	8.40
50th-Percentile Queue Length [ft/ln]	112.82	166.58	107.89	104.36	249.82	264.12	70.11	290.12	339.20	113.62	210.82	209.89
95th-Percentile Queue Length [veh/ln]	8.00	10.90	7.72	7.51	15.18	15.90	5.05	17.19	19.61	8.04	13.20	13.15
95th-Percentile Queue Length [ft/ln]	199.92	272.42	193.06	187.84	379.43	397.38	126.20	429.79	490.22	201.02	329.88	328.68

Movement, Approach, & Intersection Results

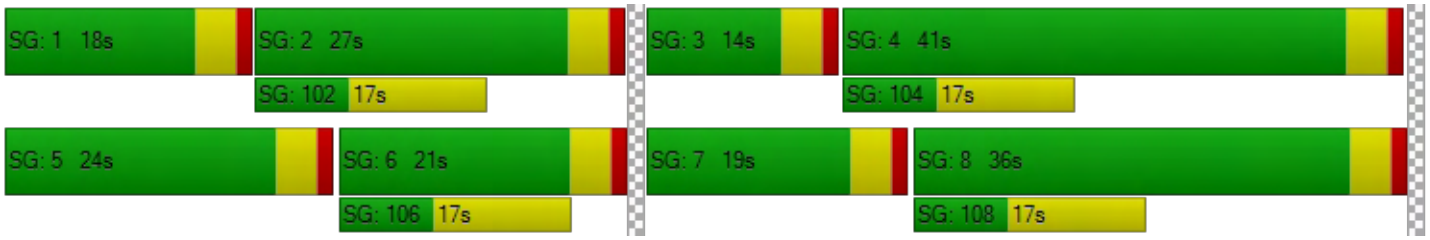
d_M, Delay for Movement [s/veh]	51.37	36.51	20.13	48.38	41.95	47.14	49.94	40.41	49.83	47.97	28.59	29.85
Movement LOS	D	D	C	D	D	D	D	D	D	D	C	C
d_A, Approach Delay [s/veh]	35.11			43.94			42.39			33.01		
Approach LOS	D			D			D			C		
d_I, Intersection Delay [s/veh]	38.77											
Intersection LOS	D											
Intersection V/C	0.801											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.074	3.075	3.106	3.159
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	460	340	640	740
d_b, Bicycle Delay [s]	29.65	34.45	23.12	19.85
l_b,int, Bicycle LOS Score for Intersection	2.283	2.401	2.485	2.438
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



General Plan Buildout (Year 2040) With Project

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	34.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.745

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	82	492	92	40	439	83	84	931	72	69	1128	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	12	0	8	36	2	4	30	21	0	16	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	105	612	112	57	572	103	106	1166	109	84	1392	89
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	153	28	14	143	26	27	292	27	21	348	22
Total Analysis Volume [veh/h]	105	612	112	57	572	103	106	1166	109	84	1392	89
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	23	0	12	21	0	26	21	0	44	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	49	39	49	38	38	8	33	33	6	32	32
g / C, Green / Cycle	0.49	0.39	0.49	0.38	0.38	0.08	0.33	0.33	0.06	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.10	0.32	0.06	0.30	0.06	0.06	0.23	0.23	0.05	0.27	0.27
s, saturation flow rate [veh/h]	1025	1900	979	1900	1615	1810	3618	1818	1810	3618	1842
c, Capacity [veh/h]	369	737	335	718	610	138	1198	602	116	1156	588
d1, Uniform Delay [s]	18.49	27.66	18.58	27.74	20.71	45.41	29.26	29.26	45.98	31.82	31.83
k, delay calibration	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.13
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.93	10.48	0.24	8.97	0.60	8.77	0.78	1.55	8.20	1.84	4.26
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.28	0.83	0.17	0.80	0.17	0.77	0.71	0.71	0.72	0.85	0.85
d, Delay for Lane Group [s/veh]	20.42	38.14	18.82	36.72	21.31	54.18	30.04	30.81	54.19	33.67	36.09
Lane Group LOS	C	D	B	D	C	D	C	C	D	C	D
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.47	14.87	0.69	13.56	1.68	2.90	8.84	9.02	2.30	11.10	11.70
50th-Percentile Queue Length [ft/ln]	36.76	371.68	17.35	338.96	42.09	72.60	221.03	225.40	57.58	277.43	292.48
95th-Percentile Queue Length [veh/ln]	2.65	21.19	1.25	19.60	3.03	5.23	13.72	13.94	4.15	16.56	17.31
95th-Percentile Queue Length [ft/ln]	66.17	529.77	31.23	489.92	75.76	130.67	342.95	348.51	103.65	414.02	432.71

Movement, Approach, & Intersection Results

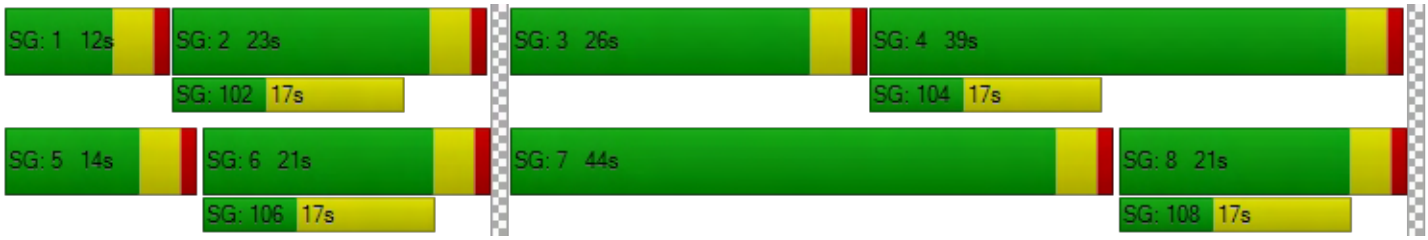
d_M, Delay for Movement [s/veh]	20.42	38.14	0.00	18.82	36.72	21.31	54.18	30.25	30.81	54.19	34.38	36.09
Movement LOS	C	D		B	D	C	D	C	C	D	C	D
d_A, Approach Delay [s/veh]	35.54			33.16			32.13			35.54		
Approach LOS	D			C			C			D		
d_I, Intersection Delay [s/veh]	34.07											
Intersection LOS	C											
Intersection V/C	0.745											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.594	2.605	3.074	3.020
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	380	340	340	700
d_b, Bicycle Delay [s]	32.81	34.45	34.45	21.13
l_b,int, Bicycle LOS Score for Intersection	2.743	2.767	2.319	2.420
Bicycle LOS	B	C	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	469.8
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	4.414

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	40	667	22	28	526	25	78	90	38	47	124	57
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	3	54	19	9	6	9	0	4	2	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	829	30	88	661	40	101	119	46	61	153	83
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	207	8	22	165	10	25	30	12	15	38	21
Total Analysis Volume [veh/h]	49	829	30	88	661	40	101	119	46	61	153	83
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	24	0	0	24	0	0	76	0	0	76	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	20	20	20	20	72	72	72	72
g / C, Green / Cycle	0.20	0.20	0.20	0.20	0.72	0.72	0.72	0.72
(v / s)_i Volume / Saturation Flow Rate	0.06	0.45	0.13	0.37	3.52	0.03	1.61	0.05
s, saturation flow rate [veh/h]	757	1888	653	1881	63	1615	133	1615
c, Capacity [veh/h]	72	380	72	378	97	1161	142	1161
d1, Uniform Delay [s]	50.00	39.95	50.00	39.95	32.99	4.06	37.46	4.16
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	41.28	576.62	177.40	394.25	596.84	0.01	262.09	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.68	2.26	1.22	1.85	2.26	0.04	1.51	0.07
d, Delay for Lane Group [s/veh]	91.28	616.57	227.40	434.20	629.82	4.08	299.55	4.19
Lane Group LOS	F	F	F	F	F	A	F	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.05	69.99	5.34	50.56	17.12	0.24	12.53	0.44
50th-Percentile Queue Length [ft/ln]	51.15	1749.66	133.53	1263.99	427.88	5.92	313.30	10.94
95th-Percentile Queue Length [veh/ln]	3.68	109.31	9.61	78.68	30.81	0.43	22.56	0.79
95th-Percentile Queue Length [ft/ln]	92.07	2732.63	240.35	1966.93	770.18	10.66	563.94	19.70

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	91.28	616.57	616.57	227.40	434.20	434.20	629.82	629.82	4.08	299.55	299.55	4.19
Movement LOS	F	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	588.22			411.13			521.61			217.00		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	469.77											
Intersection LOS	F											
Intersection V/C	4.414											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.631	2.719	2.180	2.244
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	400	400	1440	1440
d_b, Bicycle Delay [s]	32.00	32.00	3.92	3.92
l_b,int, Bicycle LOS Score for Intersection	3.058	2.861	1.999	2.050
Bicycle LOS	C	C	A	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	39.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.821

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	86	1069	170	281	1098	137	120	544	75	105	1052	358
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	21	1	0	46	0	0	1	8	5	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	107	1325	208	343	1386	167	146	665	100	133	1284	437
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	331	52	86	347	42	37	166	25	33	321	109
Total Analysis Volume [veh/h]	107	1325	208	343	1386	167	146	665	100	133	1284	437
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	33	36	0	18	21	0	14	21	0	25	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	33	33	14	40	40	10	28	28	9	27	27	27
g / C, Green / Cycle	0.08	0.33	0.33	0.14	0.40	0.40	0.10	0.28	0.28	0.09	0.27	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.06	0.28	0.28	0.13	0.29	0.29	0.08	0.14	0.14	0.07	0.24	0.24	0.24
s, saturation flow rate [veh/h]	1810	3618	1771	2663	3618	1798	1810	3618	1776	1810	3618	1869	1615
c, Capacity [veh/h]	138	1203	589	373	1434	712	177	996	489	167	975	504	435
d1, Uniform Delay [s]	45.36	31.15	31.17	42.46	25.55	25.60	44.28	30.61	30.66	44.51	35.22	35.23	35.34
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.31	0.32
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.84	7.89	14.81	9.35	3.19	6.37	9.16	0.41	0.85	8.41	3.25	14.75	17.83
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.77	0.86	0.86	0.92	0.72	0.73	0.82	0.51	0.52	0.80	0.90	0.90	0.91
d, Delay for Lane Group [s/veh]	54.20	39.04	45.97	51.81	28.74	31.97	53.44	31.02	31.51	52.92	38.47	49.98	53.17
Lane Group LOS	D	D	D	D	C	C	D	C	C	D	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.93	12.59	13.48	4.62	10.73	11.36	3.97	5.19	5.21	3.60	10.46	12.44	11.24
50th-Percentile Queue Length [ft/ln]	73.28	314.77	336.90	115.52	268.15	283.92	99.37	129.72	130.25	89.95	261.6	310.9	280.9
95th-Percentile Queue Length [veh/ln]	5.28	18.41	19.50	8.15	16.10	16.88	7.15	8.92	8.95	6.48	15.77	18.22	16.73
95th-Percentile Queue Length [ft/ln]	131.90	460.25	487.41	203.66	402.43	422.09	178.87	223.11	223.84	161.9	394.2	455.5	418.3

Movement, Approach, & Intersection Results

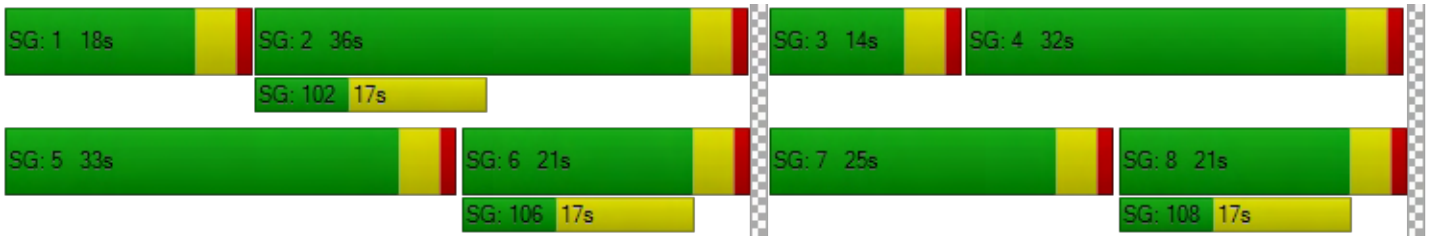
d_M, Delay for Movement [s/veh]	54.20	40.59	45.97	51.81	29.56	31.97	53.44	31.14	31.51	52.92	42.14	53.12
Movement LOS	D	D	D	D	C	C	D	C	C	D	D	D
d_A, Approach Delay [s/veh]	42.16			33.79			34.75			45.44		
Approach LOS	D			C			C			D		
d_I, Intersection Delay [s/veh]	39.54											
Intersection LOS	D											
Intersection V/C	0.821											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	0.00	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.127	0.000	2.943	3.104
Crosswalk LOS	C	F	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	640	340	340	560
d_b, Bicycle Delay [s]	23.12	34.45	34.45	25.92
l_b,int, Bicycle LOS Score for Intersection	2.462	2.602	2.061	2.579
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	38.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.767

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	167	1031	161	149	765	147	177	836	85	231	1124	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	24	28	31	0	1	28	0	51	10	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	204	1273	220	210	964	179	217	1048	104	333	1381	150
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	318	55	53	241	45	54	262	26	83	345	38
Total Analysis Volume [veh/h]	204	1273	220	210	964	179	217	1048	104	333	1381	150
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	28	35	35	14	21	0	14	33	0	18	37	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	13	33	51	10	30	30	10	27	27	14	31	31
g / C, Green / Cycle	0.13	0.33	0.51	0.10	0.30	0.30	0.10	0.27	0.27	0.14	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.11	0.25	0.14	0.08	0.21	0.21	0.08	0.21	0.21	0.13	0.28	0.28
s, saturation flow rate [veh/h]	1810	5176	1615	2663	3618	1752	2663	3618	1813	2663	3618	1806
c, Capacity [veh/h]	242	1717	827	261	1071	519	268	976	489	374	1121	560
d1, Uniform Delay [s]	42.33	29.65	13.79	44.22	31.53	31.53	44.11	33.88	33.88	42.28	33.21	33.26
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.24	0.11	0.11	0.35
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.71	2.93	0.79	5.73	4.17	8.35	5.84	1.44	6.01	7.35	3.24	16.74
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.84	0.74	0.27	0.80	0.72	0.72	0.81	0.79	0.79	0.89	0.91	0.91
d, Delay for Lane Group [s/veh]	50.04	32.57	14.58	49.95	35.69	39.88	49.95	35.32	39.89	49.63	36.45	50.00
Lane Group LOS	D	C	B	D	D	D	D	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	5.39	9.30	2.90	2.74	8.78	9.11	2.83	8.66	9.31	4.38	12.06	14.21
50th-Percentile Queue Length [ft/ln]	134.85	232.44	72.56	68.46	219.57	227.80	70.78	216.58	232.74	109.52	301.52	355.15
95th-Percentile Queue Length [veh/ln]	9.20	14.30	5.22	4.93	13.64	14.06	5.10	13.49	14.31	7.81	17.76	20.39
95th-Percentile Queue Length [ft/ln]	230.08	357.46	130.60	123.23	341.08	351.56	127.41	337.26	357.83	195.34	443.91	509.69

Movement, Approach, & Intersection Results

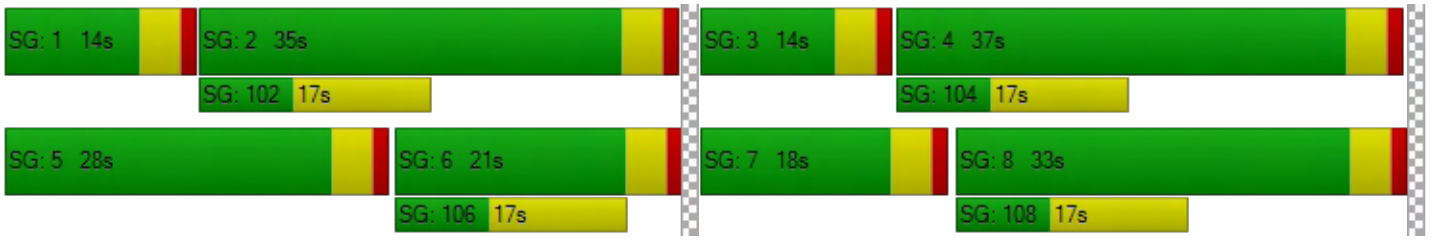
d_M, Delay for Movement [s/veh]	50.04	32.57	14.58	49.95	36.53	39.88	49.95	36.54	39.89	49.63	40.00	50.00
Movement LOS	D	C	B	D	D	D	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	32.34			39.06			38.92			42.52		
Approach LOS	C			D			D			D		
d_I, Intersection Delay [s/veh]	38.24											
Intersection LOS	D											
Intersection V/C	0.767											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.108	3.095	3.112	3.138
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	620	340	580	660
d_b, Bicycle Delay [s]	23.81	34.45	25.21	22.45
l_b,int, Bicycle LOS Score for Intersection	2.493	2.304	2.313	2.585
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	377.9
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	3.533

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	49	564	41	25	553	39	58	77	41	61	130	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	20	16	5	11	3	0	3	8	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	711	53	51	691	53	82	97	50	77	167	103
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	178	13	13	173	13	21	24	13	19	42	26
Total Analysis Volume [veh/h]	60	711	53	51	691	53	82	97	50	77	167	103
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	26	0	0	26	0	0	74	0	0	74	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	22	22	70	70	70	70
g / C, Green / Cycle	0.22	0.22	0.22	0.22	0.70	0.70	0.70	0.70
(v / s)_i Volume / Saturation Flow Rate	0.08	0.41	0.07	0.40	2.77	0.03	2.06	0.06
s, saturation flow rate [veh/h]	728	1877	714	1876	65	1615	118	1615
c, Capacity [veh/h]	72	416	72	416	98	1128	130	1128
d1, Uniform Delay [s]	50.00	38.93	50.00	38.93	31.92	4.69	36.01	4.85
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	66.23	386.33	45.11	365.22	412.34	0.02	422.74	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.83	1.84	0.71	1.79	1.83	0.04	1.88	0.09
d, Delay for Lane Group [s/veh]	116.23	425.25	95.11	404.15	444.26	4.71	458.75	4.89
Lane Group LOS	F	F	F	F	F	A	F	A
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.82	54.63	2.17	52.17	12.13	0.29	17.15	0.61
50th-Percentile Queue Length [ft/ln]	70.47	1365.67	54.31	1304.33	303.29	7.18	428.67	15.31
95th-Percentile Queue Length [veh/ln]	5.07	84.97	3.91	81.02	21.84	0.52	30.86	1.10
95th-Percentile Queue Length [ft/ln]	126.85	2124.26	97.75	2025.57	545.93	12.92	771.60	27.57

Movement, Approach, & Intersection Results

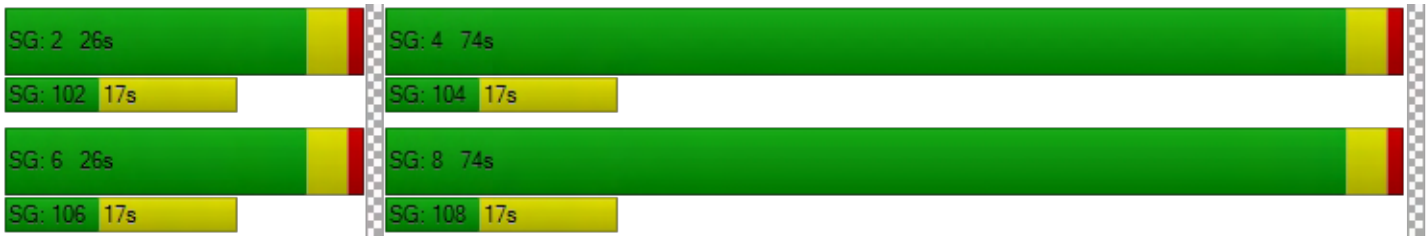
d_M, Delay for Movement [s/veh]	116.23	425.25	425.25	95.11	404.15	404.15	444.26	444.26	4.71	458.75	458.75	4.89
Movement LOS	F	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	402.75			384.32			348.29			324.03		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	377.95											
Intersection LOS	F											
Intersection V/C	3.533											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.646	2.665	2.196	2.196
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	440	440	1400	1400
d_b, Bicycle Delay [s]	30.42	30.42	4.50	4.50
l_b,int, Bicycle LOS Score for Intersection	2.919	2.871	1.937	2.132
Bicycle LOS	C	C	A	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	46.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.885

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	460	101	73	500	67	89	1451	74	135	1077	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	19	34	0	16	17	5	3	22	8	0	29	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	81	595	123	105	627	87	112	1792	98	165	1343	107
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	149	31	26	157	22	28	448	25	41	336	27
Total Analysis Volume [veh/h]	81	595	123	105	627	87	112	1792	98	165	1343	107
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	26	36	0	11	21	0	12	39	0	14	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	43	32	43	33	33	8	35	35	10	37	37
g / C, Green / Cycle	0.43	0.32	0.43	0.33	0.33	0.08	0.35	0.35	0.10	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.08	0.31	0.10	0.33	0.05	0.06	0.35	0.35	0.09	0.27	0.27
s, saturation flow rate [veh/h]	1003	1900	1030	1900	1615	1810	3618	1850	1810	3618	1829
c, Capacity [veh/h]	277	618	299	624	531	140	1261	645	181	1343	679
d1, Uniform Delay [s]	22.74	33.17	22.42	33.57	23.82	45.37	32.42	32.48	44.56	26.95	26.95
k, delay calibration	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.45	0.11	0.11	0.25
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.67	28.24	0.70	37.02	0.66	9.97	9.79	32.26	15.78	0.73	3.26
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.29	0.96	0.35	1.00	0.16	0.80	0.99	0.99	0.91	0.72	0.72
d, Delay for Lane Group [s/veh]	25.41	61.40	23.12	70.59	24.49	55.34	42.21	64.74	60.35	27.68	30.21
Lane Group LOS	C	E	C	F	C	E	D	E	E	C	C
Critical Lane Group	Yes	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.30	18.60	1.50	21.10	1.55	3.10	16.21	20.68	4.81	9.69	10.28
50th-Percentile Queue Length [ft/ln]	32.54	465.07	37.49	527.53	38.73	77.59	405.16	517.11	120.24	242.30	257.06
95th-Percentile Queue Length [veh/ln]	2.34	25.68	2.70	28.71	2.79	5.59	22.81	28.14	8.41	14.80	15.54
95th-Percentile Queue Length [ft/ln]	58.58	641.90	67.47	717.87	69.71	139.67	570.22	703.58	210.15	369.94	388.54

Movement, Approach, & Intersection Results

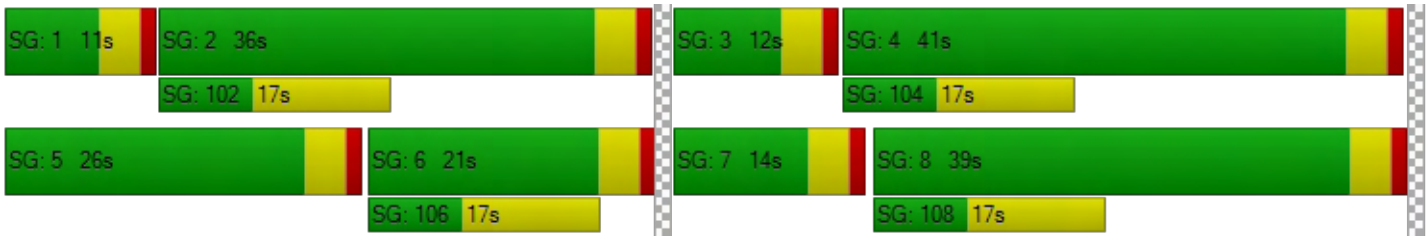
d_M, Delay for Movement [s/veh]	25.41	61.40	0.00	23.12	70.59	24.49	55.34	49.04	64.74	60.35	28.39	30.21
Movement LOS	C	E		C	F	C	E	D	E	E	C	C
d_A, Approach Delay [s/veh]	57.09			59.61			50.16			31.78		
Approach LOS	E			E			D			C		
d_I, Intersection Delay [s/veh]	46.78											
Intersection LOS	D											
Intersection V/C	0.885											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.610	2.623	3.128	3.139
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	640	340	700	740
d_b, Bicycle Delay [s]	23.12	34.45	21.13	19.85
l_b,int, Bicycle LOS Score for Intersection	2.675	2.911	2.661	2.448
Bicycle LOS	B	C	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Orange Ave (NS) at Hill St (EW)

Control Type:	Signalized	Delay (sec / veh):	182.9
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.850

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	31	563	33	27	592	43	36	107	30	42	103	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	3	20	16	5	11	3	0	3	8	48
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	710	43	53	738	57	55	134	37	54	134	89
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	178	11	13	185	14	14	34	9	14	34	22
Total Analysis Volume [veh/h]	38	710	43	53	738	57	55	134	37	54	134	89
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	35	0	0	35	0	0	65	0	0	65	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	31	31	31	31	61	61	61	61
g / C, Green / Cycle	0.31	0.31	0.31	0.31	0.61	0.61	0.61	0.61
(v / s)_i Volume / Saturation Flow Rate	0.05	0.40	0.07	0.42	1.24	0.02	1.21	0.06
s, saturation flow rate [veh/h]	694	1881	721	1876	152	1615	155	1615
c, Capacity [veh/h]	72	587	72	585	139	982	141	982
d1, Uniform Delay [s]	50.00	34.41	50.00	34.41	33.65	7.86	33.79	8.12
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	24.98	140.33	49.19	172.39	201.01	0.02	191.72	0.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.53	1.28	0.74	1.36	1.36	0.04	1.34	0.09
d, Delay for Lane Group [s/veh]	74.98	174.74	99.19	206.80	234.67	7.87	225.51	8.16
Lane Group LOS	E	F	F	F	F	A	F	A
Critical Lane Group	No	No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	1.45	36.72	2.30	41.84	9.90	0.31	9.67	0.76
50th-Percentile Queue Length [ft/ln]	36.14	918.02	57.59	1045.94	247.50	7.66	241.69	19.05
95th-Percentile Queue Length [veh/ln]	2.60	53.97	4.15	62.29	17.82	0.55	17.40	1.37
95th-Percentile Queue Length [ft/ln]	65.06	1349.17	103.67	1557.26	445.50	13.78	435.04	34.28

Movement, Approach, & Intersection Results

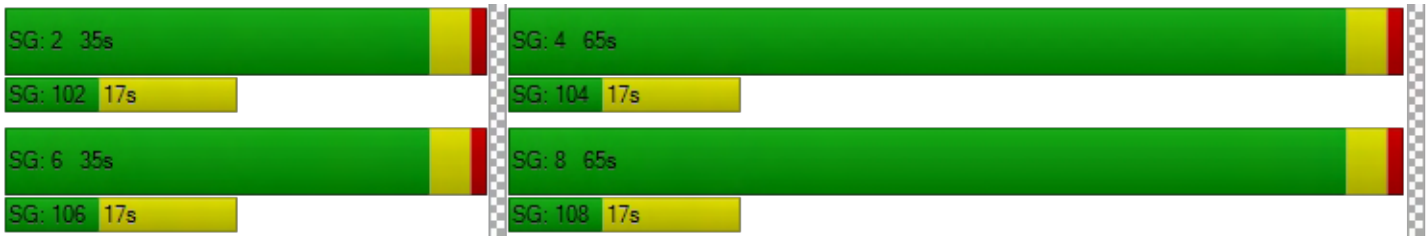
d_M, Delay for Movement [s/veh]	74.98	174.74	174.74	99.19	206.80	206.80	234.67	234.67	7.87	225.51	225.51	8.16
Movement LOS	E	F	F	F	F	F	F	F	A	F	F	A
d_A, Approach Delay [s/veh]	169.95			200.07			197.54			155.68		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	182.94											
Intersection LOS	F											
Intersection V/C	1.850											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	2.608	2.629	2.147	2.185
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	620	620	1220	1220
d_b, Bicycle Delay [s]	23.81	23.81	7.61	7.61
l_b,int, Bicycle LOS Score for Intersection	2.865	2.959	1.933	2.017
Bicycle LOS	C	C	A	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Orange Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	27.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.755

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	145.00	100.00	192.00	100.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	100.00
Speed [mph]	35.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	73	495	277	80	499	97	84	1383	105	183	879	79
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	2	0	6	13	18	22	0	7	50	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	612	340	98	615	131	120	1709	128	230	1122	96
Peak Hour Factor	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	157	87	25	158	34	31	438	33	59	287	25
Total Analysis Volume [veh/h]	91	627	348	100	630	134	123	1751	131	236	1150	98
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	2	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	7	7	0	7	0	7	7	0	7	7	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	31	0	31	0	13	41	0	18	46	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	20	0	17	0	0	20	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	27	45	27	27	27	8	37	37	14	43	43
g / C, Green / Cycle	0.30	0.30	0.50	0.30	0.30	0.30	0.09	0.41	0.41	0.16	0.48	0.48
(v / s)_i Volume / Saturation Flow Rate	0.11	0.17	0.22	0.12	0.17	0.08	0.07	0.34	0.35	0.13	0.23	0.23
s, saturation flow rate [veh/h]	809	3618	1615	811	3618	1615	1810	3618	1833	1810	3618	1825
c, Capacity [veh/h]	185	1085	806	186	1085	484	157	1490	755	280	1737	876
d1, Uniform Delay [s]	38.42	26.70	14.39	38.82	26.73	24.07	40.32	23.78	23.84	36.99	15.79	15.79
k, delay calibration	0.11	0.11	0.19	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.02	0.49	0.65	2.40	0.49	0.31	8.31	5.75	10.93	6.73	0.94	1.86
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.49	0.58	0.43	0.54	0.58	0.28	0.78	0.84	0.84	0.84	0.48	0.48
d, Delay for Lane Group [s/veh]	40.43	27.19	15.04	41.22	27.23	24.38	48.62	29.52	34.77	43.73	16.74	17.66
Lane Group LOS	D	C	B	D	C	C	D	C	C	D	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.02	5.53	4.32	2.28	5.65	2.18	2.97	12.23	13.57	5.42	5.54	5.81
50th-Percentile Queue Length [ft/ln]	50.40	138.36	107.96	56.88	141.33	54.46	74.22	305.79	339.25	135.39	138.54	145.35
95th-Percentile Queue Length [veh/ln]	3.63	9.39	7.73	4.10	9.55	3.92	5.34	17.97	19.61	9.23	9.40	9.77
95th-Percentile Queue Length [ft/ln]	90.73	234.81	193.16	102.38	238.81	98.03	133.60	449.19	490.28	230.81	235.05	244.21

Movement, Approach, & Intersection Results

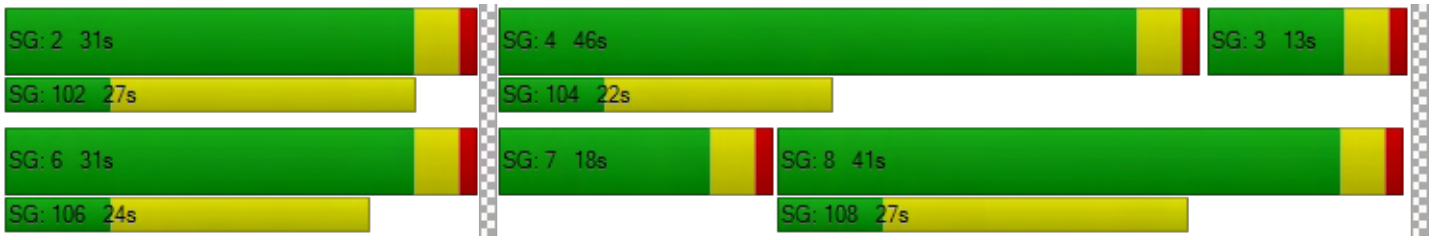
d_M, Delay for Movement [s/veh]	40.43	27.19	15.04	41.22	27.23	24.38	48.62	31.03	34.77	43.73	16.99	17.66
Movement LOS	D	C	B	D	C	C	D	C	C	D	B	B
d_A, Approach Delay [s/veh]	24.36			28.40			32.36			21.29		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	27.12											
Intersection LOS	C											
Intersection V/C	0.755											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.843	2.731	3.272	3.334
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	600	600	822	933
d_b, Bicycle Delay [s]	22.05	22.05	15.61	12.80
l_b,int, Bicycle LOS Score for Intersection	2.439	2.272	2.662	2.376
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Walnut Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	15.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.754

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	130.00	100.00	100.00	177.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	25	106	29	51	134	84	107	1682	54	58	1030	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	27	4	40	14	10	0	0	17	11
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	135	35	89	167	142	145	2062	66	71	1274	85
Peak Hour Factor	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520	0.9520
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	35	9	23	44	37	38	541	17	19	335	22
Total Analysis Volume [veh/h]	33	142	37	93	175	149	152	2166	69	75	1338	89
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	44.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	34	0	0	34	0	0	56	0	0	56	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	6	0	0	6	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	25	25	57	57	57	57	57	57
g / C, Green / Cycle	0.28	0.28	0.64	0.64	0.64	0.64	0.64	0.64
(v / s)_i Volume / Saturation Flow Rate	0.13	0.26	0.40	0.41	0.41	0.43	0.26	0.26
s, saturation flow rate [veh/h]	1616	1635	381	3618	1870	174	3618	1840
c, Capacity [veh/h]	491	499	265	2300	1189	143	2300	1170
d1, Uniform Delay [s]	26.69	31.50	19.83	10.04	10.08	31.23	8.07	8.07
k, delay calibration	0.11	0.28	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.60	9.10	8.74	1.37	2.68	13.06	0.55	1.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.43	0.84	0.57	0.64	0.64	0.52	0.41	0.41
d, Delay for Lane Group [s/veh]	27.29	40.60	28.57	11.41	12.77	44.29	8.62	9.14
Lane Group LOS	C	D	C	B	B	D	A	A
Critical Lane Group	No	Yes	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.73	9.76	3.17	8.14	8.94	2.18	4.16	4.40
50th-Percentile Queue Length [ft/ln]	93.21	244.04	79.20	203.55	223.42	54.42	103.95	110.00
95th-Percentile Queue Length [veh/ln]	6.71	14.89	5.70	12.82	13.84	3.92	7.48	7.84
95th-Percentile Queue Length [ft/ln]	167.77	372.14	142.57	320.54	345.98	97.96	187.11	196.01

Movement, Approach, & Intersection Results

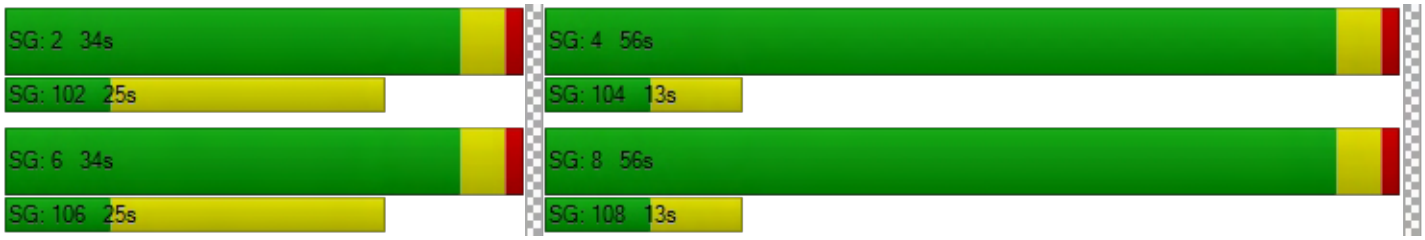
d_M, Delay for Movement [s/veh]	27.29	27.29	27.29	40.60	40.60	40.60	28.57	11.85	12.77	44.29	8.77	9.14
Movement LOS	C	C	C	D	D	D	C	B	B	D	A	A
d_A, Approach Delay [s/veh]	27.29			40.60			12.94			10.57		
Approach LOS	C			D			B			B		
d_I, Intersection Delay [s/veh]	15.38											
Intersection LOS	B											
Intersection V/C	0.754											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.080	2.416	3.185	3.255
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	667	667	1156	1156
d_b, Bicycle Delay [s]	20.00	20.00	8.02	8.02
l_b,int, Bicycle LOS Score for Intersection	1.909	2.248	2.872	2.386
Bicycle LOS	A	B	C	B

Sequence

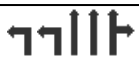
Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 14: Cherry Ave (NS) at Spring St (EW)

Control Type:	Signalized	Delay (sec / veh):	38.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.789

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	147.00	100.00	100.00	195.00	100.00	206.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	1170	144	228	1250	109	155	916	128	93	656	368
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	43	5	0	28	0	0	2	4	2	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	128	1470	181	278	1553	133	189	1120	160	115	801	449
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	368	45	70	388	33	47	280	40	29	200	112
Total Analysis Volume [veh/h]	128	1470	181	278	1553	133	189	1120	160	115	801	449
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	19	24	0	16	21	0	16	21	0	39	44	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	36	36	12	39	39	12	28	28	8	24	24	24
g / C, Green / Cycle	0.09	0.36	0.36	0.12	0.39	0.39	0.12	0.28	0.28	0.08	0.24	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.07	0.30	0.31	0.10	0.31	0.31	0.10	0.24	0.24	0.06	0.18	0.18	0.18
s, saturation flow rate [veh/h]	1810	3618	1795	2663	3618	1824	1810	3618	1781	1810	3618	1743	1615
c, Capacity [veh/h]	161	1293	642	321	1407	710	218	1013	499	149	874	421	390
d1, Uniform Delay [s]	44.72	29.73	29.77	43.24	27.06	27.12	43.24	34.02	34.02	45.04	35.08	35.08	35.08
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.12	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.57	7.25	13.65	7.01	4.72	9.15	9.93	2.06	4.62	8.26	1.26	2.59	2.79
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.79	0.85	0.85	0.87	0.80	0.80	0.87	0.85	0.85	0.77	0.74	0.74	0.74
d, Delay for Lane Group [s/veh]	53.28	36.98	43.42	50.25	31.78	36.27	53.18	36.08	38.64	53.30	36.34	37.67	37.88
Lane Group LOS	D	D	D	D	C	D	D	D	D	D	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	3.48	13.15	14.24	3.66	12.32	13.38	5.15	9.92	10.13	3.12	7.34	7.23	6.73
50th-Percentile Queue Length [ft/ln]	86.90	328.85	356.07	91.51	307.93	334.41	128.85	248.10	253.14	78.04	183.5	180.8	168.1
95th-Percentile Queue Length [veh/ln]	6.26	19.10	20.43	6.59	18.07	19.37	8.88	15.09	15.34	5.62	11.79	11.64	10.98
95th-Percentile Queue Length [ft/ln]	156.41	477.55	510.80	164.72	451.82	484.37	221.93	377.26	383.61	140.4	294.6	291.1	274.5

Movement, Approach, & Intersection Results

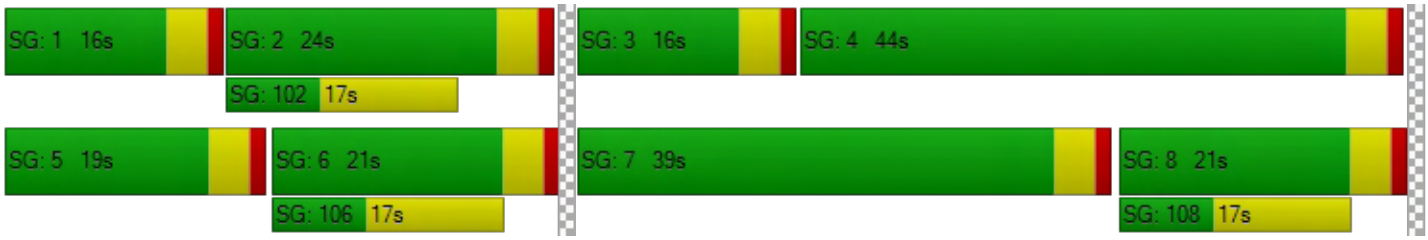
d_M, Delay for Movement [s/veh]	53.28	38.59	43.42	50.25	33.04	36.27	53.18	36.68	38.64	53.30	36.59	37.81
Movement LOS	D	D	D	D	C	D	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	40.14			35.69			39.01			38.40		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	38.20											
Intersection LOS	D											
Intersection V/C	0.789											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	0.00	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.170	0.000	2.951	3.089
Crosswalk LOS	C	F	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	400	340	340	800
d_b, Bicycle Delay [s]	32.00	34.45	34.45	18.00
l_b,int, Bicycle LOS Score for Intersection	2.538	2.640	2.368	2.310
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 15: Cherry Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	54.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.957

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	100.00	175.00	100.00	100.00	247.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	166	835	219	303	980	183	211	1292	132	318	990	175
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	28	43	13	20	1	0	15	0	27	29	28
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	203	1047	310	383	1216	224	257	1591	161	415	1237	242
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	262	78	96	304	56	64	398	40	104	309	61
Total Analysis Volume [veh/h]	203	1047	310	383	1216	224	257	1591	161	415	1237	242
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	2	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups			2,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	26	26	19	30	0	15	36	0	19	40	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	22	41	15	26	26	11	32	32	15	36	36
g / C, Green / Cycle	0.11	0.22	0.41	0.15	0.26	0.26	0.11	0.32	0.32	0.15	0.36	0.36
(v / s)_i Volume / Saturation Flow Rate	0.11	0.20	0.19	0.14	0.27	0.27	0.10	0.32	0.32	0.16	0.28	0.28
s, saturation flow rate [veh/h]	1810	5176	1615	2663	3618	1753	2663	3618	1812	2663	3618	1746
c, Capacity [veh/h]	199	1147	665	400	947	459	293	1151	577	400	1296	625
d1, Uniform Delay [s]	44.51	37.98	21.42	42.20	36.93	36.93	43.84	34.10	34.10	42.51	28.43	28.51
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.46	0.11	0.11	0.29
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	34.35	12.43	2.34	13.12	35.26	49.40	8.17	15.35	40.85	31.57	0.99	5.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.02	0.91	0.47	0.96	1.02	1.03	0.88	1.01	1.02	1.04	0.77	0.77
d, Delay for Lane Group [s/veh]	78.86	50.42	23.76	55.32	72.19	86.33	52.01	49.46	74.95	74.08	29.41	33.90
Lane Group LOS	F	D	C	E	F	F	D	F	F	F	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	6.79	9.53	5.60	5.36	15.95	17.26	3.44	15.99	20.10	6.63	10.42	10.92
50th-Percentile Queue Length [ft/ln]	169.85	238.22	140.11	134.12	398.71	431.46	85.98	399.75	502.62	165.69	260.56	273.12
95th-Percentile Queue Length [veh/ln]	11.15	14.59	9.49	9.16	22.81	24.48	6.19	22.72	27.80	11.03	15.72	16.35
95th-Percentile Queue Length [ft/ln]	278.73	364.79	237.17	229.09	570.27	612.01	154.77	568.04	694.92	275.64	392.93	408.64

Movement, Approach, & Intersection Results

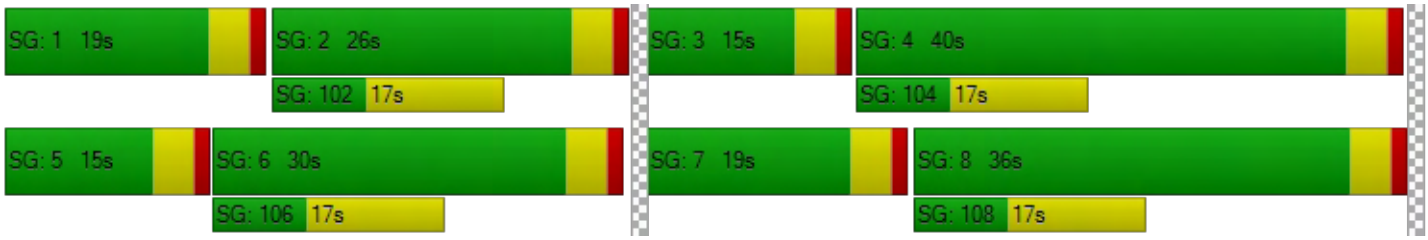
d_M, Delay for Movement [s/veh]	78.86	50.42	23.76	55.32	75.07	86.33	52.01	56.29	74.95	74.08	30.29	33.90
Movement LOS	F	D	C	E	E	F	D	E	E	F	C	C
d_A, Approach Delay [s/veh]	48.82			72.30			57.24			40.35		
Approach LOS	D			E			E			D		
d_I, Intersection Delay [s/veh]	54.81											
Intersection LOS	D											
Intersection V/C	0.957											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.139	3.141	3.178	3.239
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	440	520	640	720
d_b, Bicycle Delay [s]	30.42	27.38	23.12	20.48
l_b,int, Bicycle LOS Score for Intersection	2.418	2.562	2.665	2.601
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 20: Cherry Ave (NS) at Pacific Coast Hwy (EW)

Control Type:	Signalized	Delay (sec / veh):	30.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.794

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	118.00	135.00	100.00	100.00	180.00	100.00	100.00	186.00	100.00	100.00
Speed [mph]	30.00			30.00			35.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	78	419	41	185	588	235	195	1413	78	72	891	170
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	5	0	8	3	0	0	30	7	0	26	14
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	97	516	50	234	720	287	238	1754	102	88	1113	221
Peak Hour Factor	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760	0.9760
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	132	13	60	184	74	61	449	26	23	285	57
Total Analysis Volume [veh/h]	99	529	51	240	738	294	244	1797	105	90	1140	226
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - Coordination Group
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	86.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	29	0	11	29	0	18	39	0	11	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	0	0	0	12	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	32	21	21	32	22	22	14	40	40	6	32	32
g / C, Green / Cycle	0.36	0.23	0.23	0.36	0.24	0.24	0.16	0.44	0.44	0.07	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.10	0.15	0.16	0.21	0.20	0.18	0.13	0.35	0.35	0.05	0.25	0.25
s, saturation flow rate [veh/h]	1018	1900	1842	1120	3618	1615	1810	3618	1847	1810	3618	1743
c, Capacity [veh/h]	335	442	429	392	865	386	284	1593	813	128	1282	618
d1, Uniform Delay [s]	21.91	31.39	31.41	22.96	32.79	31.91	37.06	21.64	21.71	40.98	25.23	25.23
k, delay calibration	0.11	0.11	0.11	0.19	0.11	0.12	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.49	1.72	1.79	2.70	2.51	3.40	7.52	4.05	7.85	6.86	3.50	7.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.30	0.66	0.67	0.61	0.85	0.76	0.86	0.79	0.79	0.70	0.72	0.72
d, Delay for Lane Group [s/veh]	22.39	33.12	33.20	25.66	35.30	35.31	44.58	25.68	29.55	47.83	28.73	32.29
Lane Group LOS	C	C	C	C	D	D	D	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.43	5.88	5.73	3.95	7.78	6.17	5.67	11.38	12.58	2.15	8.69	8.99
50th-Percentile Queue Length [ft/ln]	35.77	147.05	143.22	98.86	194.55	154.13	141.75	284.46	314.49	53.82	217.31	224.77
95th-Percentile Queue Length [veh/ln]	2.58	9.86	9.65	7.12	12.36	10.24	9.57	16.91	18.40	3.88	13.53	13.91
95th-Percentile Queue Length [ft/ln]	64.38	246.49	241.36	177.94	308.93	255.93	239.37	422.76	459.90	96.88	338.20	347.71

Movement, Approach, & Intersection Results

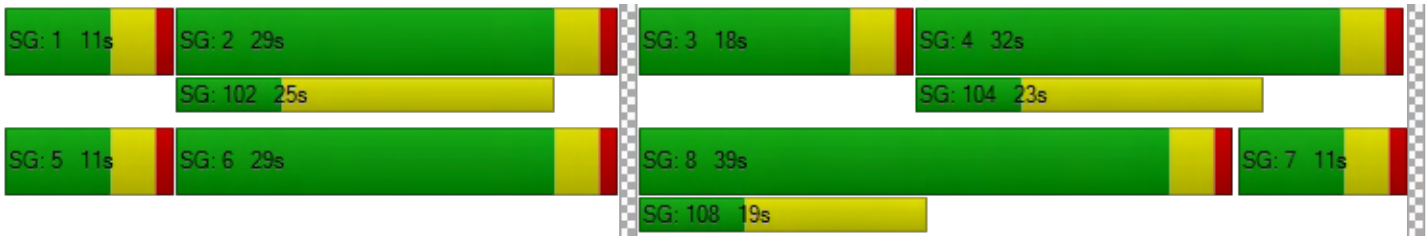
d_M, Delay for Movement [s/veh]	22.39	33.15	33.20	25.66	35.30	35.31	44.58	26.85	29.55	47.83	29.41	32.29
Movement LOS	C	C	C	C	D	D	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	31.59			33.49			28.99			31.00		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	30.87											
Intersection LOS	C											
Intersection V/C	0.794											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.614	2.821	0.000	3.257
Crosswalk LOS	B	C	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	556	556	778	622
d_b, Bicycle Delay [s]	23.47	23.47	16.81	21.36
l_b,int, Bicycle LOS Score for Intersection	2.120	2.609	2.740	2.360
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



July 5, 2019

Mr. Jesus Saldana, Senior Engineering Technician
CITY OF SIGNAL HILL
2175 Cherry Avenue
Signal Hill, CA 90755

RE: Signal Hill Business Center Signal Warrant Analysis
18-0056

Mr. Jesus Saldana:

INTRODUCTION

Ganddini Group, Inc. is pleased to submit this Signal Warrant Analysis for the Signal Hill Business Center project. As requested by City of Signal Hill engineering staff, the purpose of this Signal Warrant Analysis is to evaluate the potential need for installation of a traffic signal at the intersection of Walnut Avenue and Hill Street.

This analysis supplements the Signal Hill Business Center Traffic Impact Analysis (Kunzman Associates, Inc., Final July 2019) ["Project Traffic Impact Analysis"] and the Supplemental Afternoon School Peak Hour Analysis (Kunzman Associates, Inc, May 31, 2018). The project site is generally bounded by Gundry Avenue to the west, Gundry Hill Apartments and American University of Health Sciences to the north, Gaviota Avenue to the east, and the Signal Hill City Limits and Alamitos Avenue to the south. The project site is currently vacant. The proposed project involves developing the project site with a business park consisting of nine buildings totaling 139,080 square feet plus 12,000 square feet of mezzanine, for a total of 151,080 square feet of gross floor area. Full access driveways are proposed at Gundry Avenue, Walnut Avenue, and Alamitos Avenue. The proposed project is anticipated to be constructed and fully operational by Year 2020.

Although this is a technical report, effort has been made to write the report clearly and concisely. A glossary is provided in Appendix A to assist the reader with technical terms related to transportation engineering.

EXISTING ROADWAY CONDITIONS

The study intersection of Walnut Avenue at Hill Street is currently all-way stop controlled. Each approach provides one shared left/through/right turn lane, except for the southbound approach, which provides one shared left turn/through lane and one dedicated right turn lane. The study intersection provides school crosswalk markings on all four legs.

Walnut Avenue is a two lane undivided roadway trending in a north-south direction in the project vicinity. North of Hill Street, Walnut Avenue has a curb-to-curb width of approximately 52 feet with on-street parking permitted on both sides of the roadway. South of Hill Street, Walnut Avenue has a curb-to-curb width of approximately 42 feet with on-street parking permitted on both sides of the roadway. The posted speed limit on Walnut Avenue is 30 miles per hour in the project vicinity, except near the intersection at Hill Street where a school zone speed limit of 25 miles per hour applies when children are present.

Hill Street is a two lane undivided roadway trending in an east-west direction in the project vicinity. Hill Street has a curb-to-curb width of approximately 36 feet with on-street parking permitted on both sides of the roadway.

Existing vehicular and pedestrian volumes were obtained at the study intersection in October 2018 during typical weekday conditions. Appendix B contains the traffic count worksheets.

EXISTING TRAFFIC SIGNAL WARRANT ANALYSIS

The application of traffic control devices is governed by Federal standards adopted by the State of California and contained in the California Manual on Uniform Traffic Control Devices (California MUTCD, 2014). Part 4C – Traffic Control Signal Needs Studies of the California MUTCD contains a total of nine traffic signal warrants, or criteria, which serve to determine whether installation of a traffic signal is justified at a particular location. As noted in the California MUTCD, application of the traffic signal warrants should be based on engineering judgement; satisfaction of one or more traffic signal warrants shall not in itself require the installation of a traffic signal.

The traffic signal warrants are based on criteria for "urban" or "rural" settings. Urban criteria are used when the speed limit (or critical speed) for major street is 40 miles per hour or less. Rural criteria are used when the speed limit for the major street is greater than 40 miles per hour or the intersection is located in the built up area of an isolated community (i.e., population less than 10,000). For purposes of this traffic signal warrant analysis, the study area is considered urban since the posted speed limit is less than 40 miles per hour.

The following provides a brief summary of the evaluation for each of the traffic signal warrants based on existing conditions. Detailed traffic signal warrant worksheets are included in Appendix C.

Warrant 1 – Eight-Hour Vehicular Volume

Warrant 1 considers vehicular traffic volume for each of any eight hours of an average day. To determine if Warrant 1 is satisfied, eight hour vehicular volumes are evaluated against criteria for minimum vehicular volume (Condition A) and interruption of continuous traffic (Condition B). One or both conditions may be satisfied, or 80% of both conditions, for Warrant 1 to be satisfied. Based on the existing traffic data collected, Warrant 1 is not currently satisfied at the study intersection.

Warrant 2 – Four-Hour Vehicular Volume

Warrant 2 considers vehicular traffic volume for each of any four hours of an average day. To determine if Warrant 2 is satisfied, major street approach volumes versus the higher minor street approach volume are plotted against the applicable curve line (i.e., minimum volume criteria). Warrant 2 is satisfied if all four plotted points fall above the applicable curve. Based on the existing traffic data collected, Warrant 2 is not currently satisfied at the study intersection.

Warrant 3 – Peak Hour Vehicular Volume

Warrant 3 considers vehicular traffic volume for the peak hour of an average day. To determine if Warrant 3 is satisfied, major street approach volumes versus the higher minor street approach volume are plotted against the applicable curve line (i.e., minimum volume criteria). Warrant 3 is satisfied if the plotted point falls above

the applicable curve. Based on the existing traffic data collected, Warrant 3 is not currently satisfied at the study intersection.

Warrant 4 – Pedestrian Volume

Warrant 4 considers four-hour and peak hour pedestrian volumes compared to the traffic volumes on the major street on an average day. To determine if Warrant 4 is satisfied, four-hour and peak hour pedestrian volumes versus major street approach volumes are plotted against the applicable curve lines (i.e., minimum volume criteria). Warrant 4 is satisfied if the plotted points fall above the applicable curve. Based on the existing traffic data collected, Warrant 4 is not currently satisfied at the study intersection.

Warrant 5 – School Crossing

Warrant 5 considers the frequency and adequacy of gaps in the vehicular traffic stream as related to the number and size of groups of schoolchildren at an established school crossing across the major street. The California MUTCD defines "schoolchildren" as elementary through high school students. This warrant also requires a minimum of 20 school age pedestrians crossing the major street per hour.

As stated in the California MUTCD, before a decision is made to install a traffic control signal based on school crossing needs, consideration shall be given to the implementation of other remedial measures, such as warning signs and flashers, school speed zones, school crossing guards, or a grade-separated crossing. It should be noted that the study intersection is currently all-way stop-controlled, is located within a school speed zone, and provides a school crossing guard during school commute times. The presence of an adult crossing guard effectively ensures school-age children receive the necessary gaps for crossing the intersection. There were no reported collisions involving bicycles or pedestrians based on review of the collision records discussed under Warrant 7.

Based on the existing school crossing measures, Warrant 5 is not currently satisfied at the study intersection.

Warrant 6 – Coordinated Signal System

Warrant 6 considers whether a traffic signal may be necessary to maintain proper progression and platooning of vehicles in a coordinated traffic signal system. Neither Walnut Avenue nor Hill Street are required to maintain proper progression, therefore, Warrant 6 is not currently satisfied at the study intersection.

Warrant 7 – Crash Experience

Warrant 7 considers the severity and frequency of traffic collisions within a 12-month period that are susceptible to correction by installation of a traffic signal, such as broadside or right-of-way violations involving vehicles, bicycles, or pedestrians.

Collision records were obtained for the period from January 1, 2013 to November 2, 2018. Collision history for January 2013 to December 2017 was mapped using the Transportation Injury Mapping System (TIMS) developed by University of California, Berkeley. Since the TIMS database does not currently include collision records for 2018, additional records for the period from January 1, 2018 to November 2, 2018 were obtained from the Statewide Integrated Traffic Records System (SWITRS). Collision records are provided in Appendix D.

A total of five collisions were reported within 100 feet of the study intersection during the review period. Only three of the five collisions within 100 feet of the study intersection are susceptible to correction by installation of a traffic signal, two of which occurred within a 12-month period. Based on review of collision records obtained, Warrant 7 is not currently satisfied at the study intersection.

Warrant 8 – Roadway Network

Warrant 8 considers whether installation of a traffic signal would be justified to encourage concentration and organization of traffic flow on a roadway network. All parts of Warrant 8 must be satisfied, including minimum peak hour volumes, 5-year projected volumes, and major route characteristics. Consistent with the Signal Hill Business Center Traffic Impact Analysis, five-year projected volumes were determined by increasing existing volumes by one-percent (1%) per year over a five-year period. Based on the existing traffic data collected, Warrant 8 is not currently satisfied at the study intersection.

Warrant 9 – Intersection Near a Grade Crossing

Warrant 9 considers the proximity to the intersection of a railway grade crossing on an intersection approach controlled by a STOP or YIELD sign. This warrant does not apply since there are no railway grade crossings in the project vicinity.

FUTURE CONDITIONS

The Project Traffic Impact Analysis and the Supplemental Afternoon School Peak Hour Analysis contain future traffic volume projections for the AM, School PM, and PM peak hours. Based on the peak hour traffic signal warrants for General Plan Buildout With Project volumes, a traffic signal is not forecast to be warranted for future conditions. The future conditions peak hour traffic signal warrant worksheets are provided in Appendix E.

CONCLUSION

The following is a summary of the results of the traffic signal warrant analysis for existing conditions:

Traffic Signal Warrant	Satisfied?
Warrant 1 - Eight Hour Vehicular Volume	No
Warrant 2 - Four Hour Vehicular Volume	No
Warrant 3 - Peak Hour Vehicular Volume	No
Warrant 4 - Pedestrian Volume	No
Warrant 5 - School Crossing	No
Warrant 6 - Coordinated Signal System	No
Warrant 7 - Crash Experience	No
Warrant 8 - Roadway Network	No
Warrant 9 - Intersection Near Grade Crossing	Not Applicable

Mr. Jesus Saldana, Senior Engineering Technician
CITY OF SIGNAL HILL
July 5, 2019

Since none of the traffic signal warrants are currently satisfied, installation of a traffic signal at the study intersection is not warranted based on existing conditions.

Based on the peak hour traffic signal warrants for General Plan Buildout With Project volumes, a traffic signal is not forecast to be warranted for future conditions.

We appreciate the opportunity to assist you on this project. Should you have any questions or if we can be of further assistance, please do not hesitate to call at (714) 795-3100.

Sincerely,

Giancarlo Ganddini, PE, PTP
Principal



APPENDIX A

GLOSSARY

GLOSSARY OF TERMS

ACRONYMS

AC	Acres
ADT	Average Daily Traffic
Caltrans	California Department of Transportation
DU	Dwelling Unit
ICU	Intersection Capacity Utilization
LOS	Level of Service
TSF	Thousand Square Feet
V/C	Volume/Capacity
VMT	Vehicle Miles Traveled

TERMS

AVERAGE DAILY TRAFFIC: The average 24-hour volume for a stated period divided by the number of days in that period. For example, Annual Average Daily Traffic is the total volume during a year divided by 365 days.

BANDWIDTH: The number of seconds of green time available for through traffic in a signal progression.

BOTTLENECK: A point of constriction along a roadway that limits the amount of traffic that can proceed downstream from its location.

CAPACITY: The maximum number of vehicles that can be reasonably expected to pass over a given section of a lane or a roadway in a given time period.

CHANNELIZATION: The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movements of both vehicles and pedestrians.

CLEARANCE INTERVAL: Nearly same as yellow time. If there is an all red interval after the end of a yellow, then that is also added into the clearance interval.

CONTROL DELAY: The component of delay, typically expressed in seconds per vehicle, resulting from the type of traffic control at an intersection. Control delay is measured by comparison with the uncontrolled condition; it includes delay incurred by slowing down, stopping/waiting, and speeding up.

CORDON: An imaginary line around an area across which vehicles, persons, or other items are counted (in and out).

CORNER SIGHT DISTANCE: The minimum sight distance required by the driver of a vehicle to cross or enter the lanes of the major roadway without requiring approaching traffic travelling at a given speed to radically alter their speed or trajectory. Corner sight distance is measured from the driver's eye at 42 inches above the pavement to an object height of 36 inches above the pavement in the center of the nearest approach lane.

CYCLE LENGTH: The time period in seconds required for a traffic signal to complete one full cycle of indications.

CUL-DE-SAC: A local street open at one end only and with special provisions for turning around.

DAILY CAPACITY: A theoretical value representing the daily traffic volume that will typically result in a peak hour volume equal to the capacity of the roadway.

DELAY: The time consumed while traffic is impeded in its movement by some element over which it has no control, usually expressed in seconds per vehicle.

DEMAND RESPONSIVE SIGNAL: Same as traffic-actuated signal.

DENSITY: The number of vehicles occupying in a unit length of the through traffic lanes of a roadway at any given instant. Usually expressed in vehicles per mile.

DETECTOR: A device that responds to a physical stimulus and transmits a resulting impulse to the signal controller.

DESIGN SPEED: A speed selected for purposes of design. Features of a highway, such as curvature, superelevation, and sight distance (upon which the safe operation of vehicles is dependent) are correlated to design speed.

DIRECTIONAL SPLIT: The percent of traffic in the peak direction at any point in time.

DIVERSION: The rerouting of peak hour traffic to avoid congestion.

FORCED FLOW: Opposite of free flow.

FREE FLOW: Volumes are well below capacity. Vehicles can maneuver freely and travel is unimpeded by other traffic.

GAP: Time or distance between successive vehicles in a traffic stream, rear bumper to front bumper.

HEADWAY: Time or distance spacing between successive vehicles in a traffic stream, front bumper to front bumper.

INTERCONNECTED SIGNAL SYSTEM: A number of intersections that are connected to achieve signal progression.

LEVEL OF SERVICE: A qualitative measure of a number of factors, which include speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs.

LOOP DETECTOR: A vehicle detector consisting of a loop of wire embedded in the roadway, energized by alternating current and producing an output circuit closure when passed over by a vehicle.

MINIMUM ACCEPTABLE GAP: Smallest time headway between successive vehicles in a traffic stream into which another vehicle is willing and able to cross or merge.

MULTI-MODAL: More than one mode; such as automobile, bus transit, rail rapid transit, and bicycle transportation modes.

OFFSET: The time interval in seconds between the beginning of green at one intersection and the beginning of green at an adjacent intersection.

PLATOON: A closely grouped component of traffic that is composed of several vehicles moving, or standing ready to move, with clear spaces ahead and behind.

PASSENGER CAR EQUIVALENT (PCE): A metric used to assess the impact of larger vehicles, such as trucks, recreational vehicles, and buses, by converting the traffic volume of larger vehicles to an equivalent number of passenger cars.

PEAK HOUR: The 60 consecutive minutes with the highest number of vehicles.

PRETIMED SIGNAL: A type of traffic signal that directs traffic to stop and go on a predetermined time schedule without regard to traffic conditions. Also, fixed time signal.

PROGRESSION: A term used to describe the progressive movement of traffic through several signalized intersections.

QUEUE: The number of vehicles waiting at a service area such as a traffic signal, stop sign, or access gate.

QUEUE LENGTH: The length of vehicle queue, typically expressed in feet, waiting at a service area such as a traffic signal, stop sign, or access gate.

SCREEN-LINE: An imaginary line or physical feature across which all trips are counted, normally to verify the validity of mathematical traffic models.

SHARED/RECIPROCAL PARKING AGREEMENT: A written binding document executed between property owners to provide a designated number of off-street parking stalls within a designated area to be available for specified businesses or land uses.

SIGHT DISTANCE: The continuous length of roadway visible to a driver or roadway user.

SIGNAL CYCLE: The time period in seconds required for one complete sequence of signal indications.

SIGNAL PHASE: The part of the signal cycle allocated to one or more traffic movements.

STACKING DISTANCE: The length of area available behind a service area, such as a traffic signal or gate, for vehicle queueing to occur.

STARTING DELAY: The delay experienced in initiating the movement of queued traffic from a stop to an average running speed through an intersection.

STOPPING SIGHT DISTANCE: The minimum distance required by the driver of a vehicle on the major roadway travelling at a given speed to bring the vehicle to a stop after an object on the road becomes visible. Stopping sight distance is measured from the driver's eye at 42 inches above the pavement to an object height of 6 inches above the pavement.

TRAFFIC-ACTUATED SIGNAL: A type of traffic signal that directs traffic to stop and go in accordance with the demands of traffic, as registered by the actuation of detectors.

TRIP: The movement of a person or vehicle from one location (origin) to another (destination). For example, from home to store to home is two trips, not one.

TRIP-END: One end of a trip at either the origin or destination (i.e., each trip has two trip-ends). A trip-end occurs when a person, object, or message is transferred to or from a vehicle.

TRIP GENERATION RATE: The quantity of trips produced and/or attracted by a specific land use stated in terms of units such as per dwelling, per acre, and per 1,000 square feet of floor space.

TRUCK: A vehicle having dual tires on one or more axles, or having more than two axles.

TURNING RADIUS: The circular arc formed by the smallest turning path radius of the front outside tire of a vehicle, such as that performed by a U-turn maneuver. This is based on the length and width of the wheel base as well as the steering mechanism of the vehicle.

UNBALANCED FLOW: Heavier traffic flow in one direction than the other. On a daily basis, most facilities have balanced flow. During the peak hours, flow is seldom balanced in an urban area.

VEHICLE MILES OF TRAVEL: A measure of the amount of usage of a section of highway, obtained by multiplying the average daily traffic by length of facility in miles.

APPENDIX B

VOLUME COUNT WORKSHEETS

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Signal Hill
N/S: Walnut Avenue
E/W: Hill Street
Weather: Clear

File Name : SGH_Walnut_Hill 12
Site Code : 22518786
Start Date : 10/18/2018
Page No : 1

Groups Printed- Total Volume

	Walnut Avenue Southbound				Hill Street Westbound				Walnut Avenue Northbound				Hill Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	17	2	19	8	10	6	24	0	38	1	39	6	10	1	17	99
07:15 AM	5	22	7	34	5	19	8	32	4	50	2	56	8	12	5	25	147
07:30 AM	23	34	35	92	11	13	16	40	5	54	1	60	7	24	9	40	232
07:45 AM	16	39	50	105	15	18	8	41	13	49	6	68	10	19	18	47	261
Total	44	112	94	250	39	60	38	137	22	191	10	223	31	65	33	129	739
08:00 AM	16	42	43	101	18	16	6	40	9	47	7	63	7	13	19	39	243
08:15 AM	0	40	11	51	8	17	0	25	6	45	4	55	7	26	12	45	176
08:30 AM	0	41	6	47	6	20	4	30	9	44	4	57	6	50	24	80	214
08:45 AM	5	35	2	42	5	32	7	44	16	48	3	67	12	60	29	101	254
Total	21	158	62	241	37	85	17	139	40	184	18	242	32	149	84	265	887
09:00 AM	4	26	9	39	2	16	4	22	5	51	2	58	1	18	3	22	141
09:15 AM	2	31	10	43	8	8	9	25	2	33	1	36	7	15	3	25	129
09:30 AM	6	36	23	65	11	11	12	34	3	30	7	40	4	10	5	19	158
09:45 AM	4	23	12	39	1	9	3	13	5	35	0	40	6	7	4	17	109
Total	16	116	54	186	22	44	28	94	15	149	10	174	18	50	15	83	537
10:00 AM	9	15	7	31	8	13	4	25	1	38	1	40	3	9	6	18	114
10:15 AM	3	22	4	29	3	22	4	29	3	28	2	33	4	11	2	17	108
10:30 AM	9	25	4	38	4	12	8	24	3	28	8	39	4	10	5	19	120
10:45 AM	5	22	9	36	4	9	5	18	3	25	4	32	4	4	1	9	95
Total	26	84	24	134	19	56	21	96	10	119	15	144	15	34	14	63	437
11:00 AM	6	27	14	47	4	11	5	20	2	32	0	34	6	11	3	20	121
11:15 AM	1	24	24	49	4	12	4	20	0	35	2	37	6	6	3	15	121
11:30 AM	4	32	12	48	7	8	6	21	2	46	3	51	5	11	2	18	138
11:45 AM	1	32	9	42	3	17	4	24	4	51	4	59	5	10	2	17	142
Total	12	115	59	186	18	48	19	85	8	164	9	181	22	38	10	70	522
12:00 PM	10	36	8	54	3	13	4	20	11	57	15	83	9	22	3	34	191
12:15 PM	7	37	7	51	6	16	7	29	1	50	5	56	3	11	2	16	152
12:30 PM	8	47	5	60	7	16	5	28	2	43	8	53	1	14	1	16	157
12:45 PM	6	40	8	54	11	18	13	42	5	42	5	52	9	14	5	28	176
Total	31	160	28	219	27	63	29	119	19	192	33	244	22	61	11	94	676
01:00 PM	7	30	7	44	4	16	4	24	6	35	1	42	8	8	4	20	130
01:15 PM	13	29	16	58	5	11	3	19	8	47	2	57	6	13	14	33	167
01:30 PM	15	37	34	86	5	30	4	39	9	41	5	55	6	19	16	41	221
01:45 PM	14	36	39	89	6	10	8	24	2	56	7	65	4	13	8	25	203
Total	49	132	96	277	20	67	19	106	25	179	15	219	24	53	42	119	721
02:00 PM	6	32	14	52	3	25	3	31	3	45	6	54	7	17	3	27	164
02:15 PM	5	24	10	39	2	17	10	29	6	31	5	42	5	8	2	15	125
02:30 PM	4	37	4	45	7	16	2	25	2	41	3	46	3	16	3	22	138
02:45 PM	3	38	10	51	5	10	3	18	4	49	10	63	9	11	8	28	160
Total	18	131	38	187	17	68	18	103	15	166	24	205	24	52	16	92	587
03:00 PM	1	31	11	43	5	15	5	25	2	57	3	62	6	25	4	35	165
03:15 PM	5	39	9	53	6	19	6	31	2	42	2	46	1	14	2	17	147
03:30 PM	9	45	7	61	5	10	5	20	5	47	7	59	7	40	20	67	207
03:45 PM	8	43	9	60	6	54	12	72	29	50	5	84	2	48	15	65	281
Total	23	158	36	217	22	98	28	148	38	196	17	251	16	127	41	184	800
04:00 PM	11	45	8	64	5	13	7	25	9	45	9	63	10	22	5	37	189
04:15 PM	4	49	11	64	5	22	5	32	5	41	4	50	9	14	5	28	174
04:30 PM	7	47	10	64	1	13	3	17	5	62	5	72	1	18	7	26	179
04:45 PM	7	37	11	55	4	15	9	28	12	56	4	72	3	19	4	26	181
Total	29	178	40	247	15	63	24	102	31	204	22	257	23	73	21	117	723

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E/W: Hill Street
Weather: Clear

File Name : SGH_Walnut_Hill 12
Site Code : 22518786
Start Date : 10/18/2018

Groups Printed- Total Volume

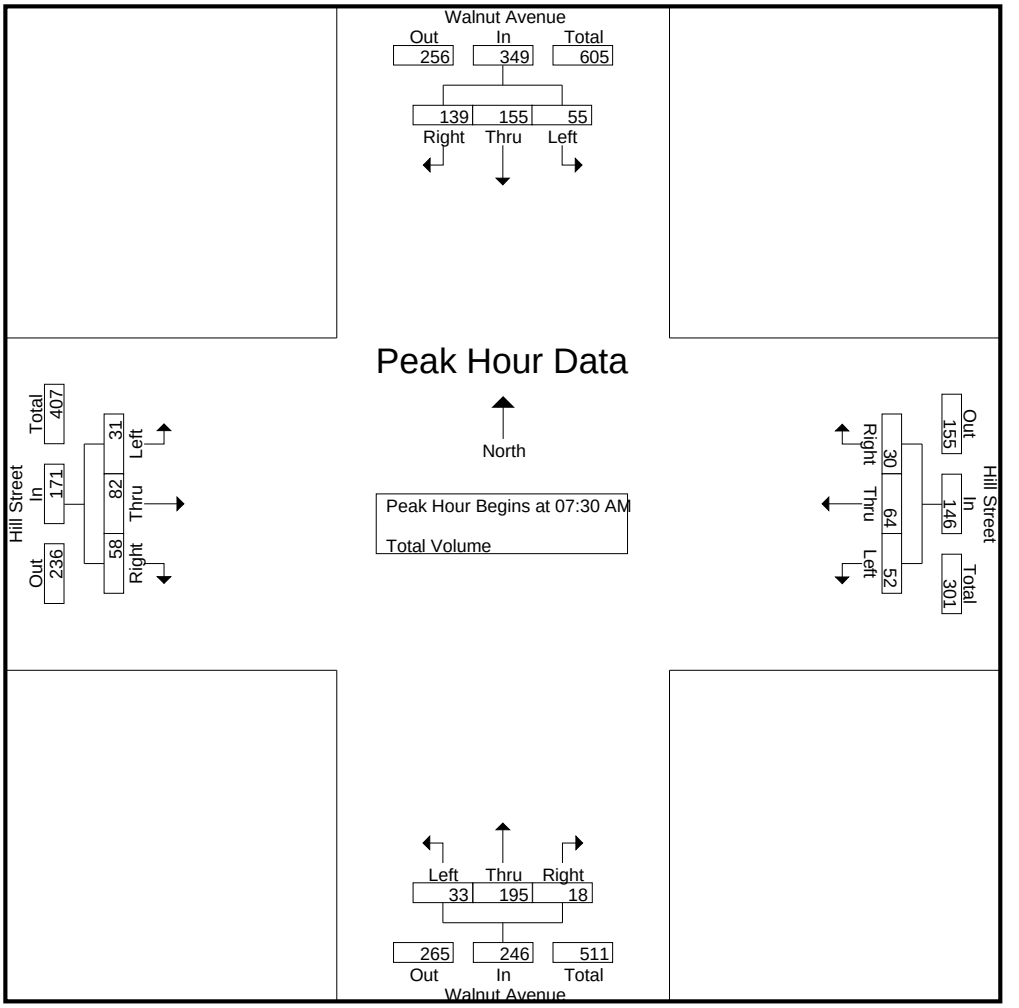
	Walnut Avenue Southbound				Hill Street Westbound				Walnut Avenue Northbound				Hill Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
05:00 PM	9	57	15	81	0	12	8	20	8	53	7	68	10	29	2	41	210
05:15 PM	9	54	11	74	2	17	7	26	4	50	7	61	7	22	3	32	193
05:30 PM	13	54	18	85	7	18	4	29	3	57	6	66	4	15	1	20	200
05:45 PM	14	56	22	92	3	22	8	33	9	41	1	51	8	11	7	26	202
Total	45	221	66	332	12	69	27	108	24	201	21	246	29	77	13	119	805
06:00 PM	6	44	10	60	4	18	7	29	0	35	10	45	13	23	7	43	177
06:15 PM	5	44	16	65	7	25	6	38	1	49	6	56	3	16	3	22	181
06:30 PM	2	64	7	73	6	19	1	26	3	39	5	47	5	20	5	30	176
06:45 PM	7	43	6	56	8	21	3	32	3	37	4	44	8	12	4	24	156
Total	20	195	39	254	25	83	17	125	7	160	25	192	29	71	19	119	690
Grand Total	334	1760	636	2730	273	804	285	1362	254	2105	219	2578	285	850	319	1454	8124
Apprch %	12.2	64.5	23.3		20	59	20.9		9.9	81.7	8.5		19.6	58.5	21.9		
Total %	4.1	21.7	7.8	33.6	3.4	9.9	3.5	16.8	3.1	25.9	2.7	31.7	3.5	10.5	3.9	17.9	

	Walnut Avenue Southbound				Hill Street Westbound				Walnut Avenue Northbound				Hill Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 06:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	**23**	34	35	92	11	13	**16**	40	5	**54**	1	60	7	24	9	40	232
07:45 AM	16	39	**50**	**105**	15	**18**	8	**41**	**13**	49	6	**68**	**10**	19	18	**47**	**261**
08:00 AM	16	**42**	43	101	**18**	16	6	40	9	47	**7**	63	7	13	**19**	39	243
08:15 AM	0	40	11	51	8	17	0	25	6	45	4	55	7	**26**	12	45	176
Total Volume	55	155	139	349	52	64	30	146	33	195	18	246	31	82	58	171	912
% App. Total	15.8	44.4	39.8		35.6	43.8	20.5		13.4	79.3	7.3		18.1	48	33.9		
PHF	.598	.923	.695	.831	.722	.889	.469	.890	.635	.903	.643	.904	.775	.788	.763	.910	.874

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Peak Hour Analysis From 07:00 AM to 06:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:15 AM				04:30 PM				08:00 AM			
+0 mins.	**23**	34	35	92	5	**19**	8	32	5	**62**	5	**72**	7	13	19	39
+15 mins.	16	39	**50**	**105**	11	13	**16**	40	**12**	56	4	72	7	26	12	45
+30 mins.	16	**42**	43	101	15	18	8	**41**	8	53	**7**	68	6	50	24	80
+45 mins.	0	40	11	51	**18**	16	6	40	4	50	7	61	**12**	**60**	**29**	**101**
Total Volume	55	155	139	349	49	66	38	153	29	221	23	273	32	149	84	265
% App. Total	15.8	44.4	39.8		32	43.1	24.8		10.6	81	8.4		12.1	56.2	31.7	
PHF	.598	.923	.695	.831	.681	.868	.594	.933	.604	.891	.821	.948	.667	.621	.724	.656

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Weather: Clear

File Name : SGH_Walnut_Hill 12
Site Code : 22518786
Start Date : 10/18/2018

Groups Printed- Bikes

	Walnut Avenue Southbound				Hill Street Westbound				Walnut Avenue Northbound				Hill Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	3
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
Total	0	1	0	1	0	0	0	0	0	4	0	4	0	0	0	0	5
08:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
08:15 AM	0	0	2	2	0	1	0	1	0	0	0	0	0	0	0	0	3
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	2	2	0	1	0	1	0	1	0	1	1	1	0	2	6
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
10:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
10:45 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	1	2	0	0	0	0	0	1	0	1	0	0	0	0	3
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
01:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	1	2	0	0	0	0	0	1	0	1	0	0	0	0	3
03:00 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
03:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
03:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	2	0	0	0	0	0	2	0	2	0	0	0	0	4
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	0	1	1	0	1	0	1	0	0	0	0	0	1	0	1	3
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	1	2	0	1	0	1	0	0	0	0	0	1	0	1	4

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E/W: Hill Street
Weather: Clear

File Name : SGH_Walnut_Hill 12
Site Code : 22518786
Start Date : 10/18/2018
Page No : 2

Groups Printed- Bikes

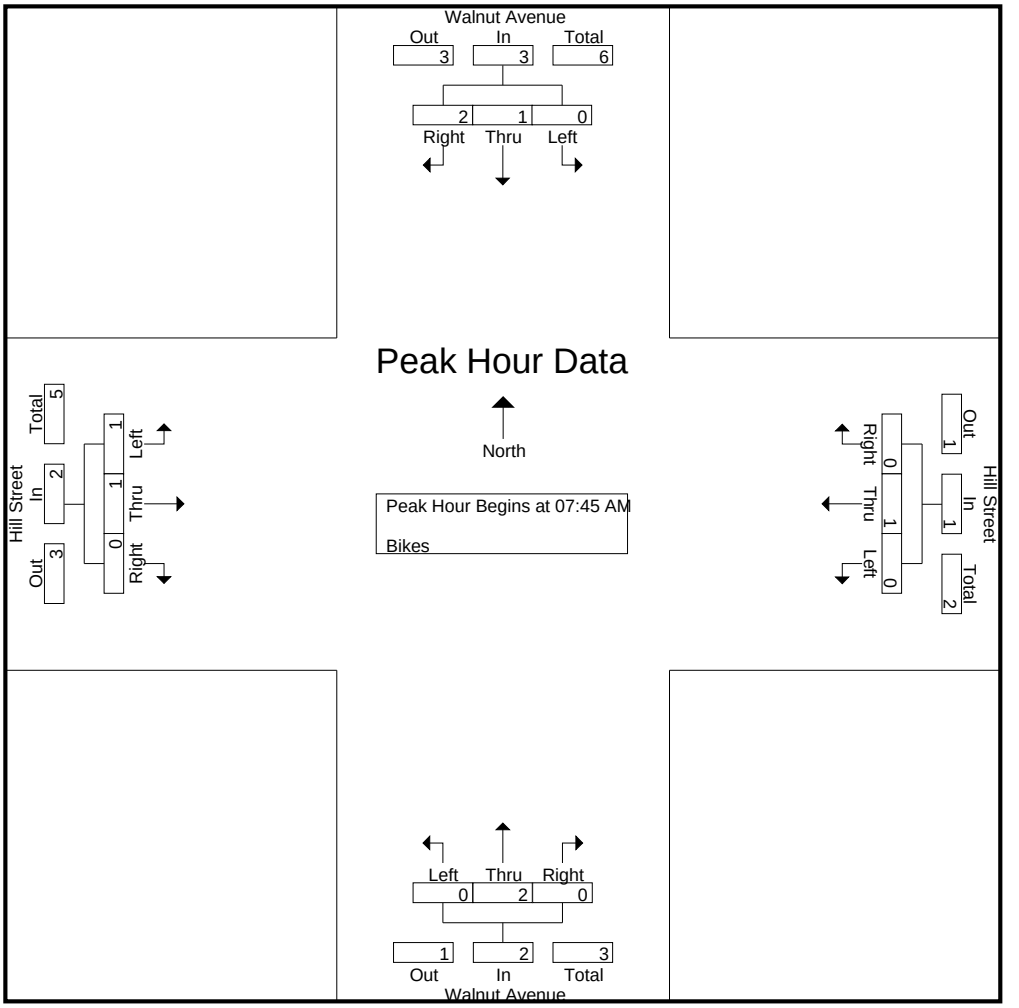
	Walnut Avenue Southbound				Hill Street Westbound				Walnut Avenue Northbound				Hill Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	1	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
Total	0	1	0	1	0	0	0	0	0	3	0	3	1	0	0	1	5
06:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
06:30 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
06:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	1	2	0	0	0	0	0	1	0	1	0	0	0	0	3
Grand Total	1	10	7	18	0	3	0	3	0	13	0	13	2	2	0	4	38
Apprch %	5.6	55.6	38.9		0	100	0		0	100	0		50	50	0		
Total %	2.6	26.3	18.4	47.4	0	7.9	0	7.9	0	34.2	0	34.2	5.3	5.3	0	10.5	

	Walnut Avenue Southbound				Hill Street Westbound				Walnut Avenue Northbound				Hill Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 06:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	**1**	0	1	0	0	0	0	0	**1**	0	**1**	0	0	0	0	2
08:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	**1**	0	**1**	2
08:15 AM	0	0	**2**	**2**	0	**1**	0	**1**	0	0	0	0	0	0	0	0	**3**
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	1	1
Total Volume	0	1	2	3	0	1	0	1	0	2	0	2	1	1	0	2	8
% App. Total	0	33.3	66.7		0	100	0		0	100	0		50	50	0		
PHF	.000	.250	.250	.375	.000	.250	.000	.250	.000	.500	.000	.500	.250	.250	.000	.500	.667

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Peak Hour Analysis From 07:00 AM to 06:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:15 AM				07:45 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	**3**	0	**3**	0	0	0	0
+15 mins.	0	**1**	0	1	0	0	0	0	0	0	0	0	0	**1**	0	**1**
+30 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
+45 mins.	0	0	**2**	**2**	0	**1**	0	**1**	0	1	0	1	**1**	0	0	1
Total Volume	0	1	2	3	0	1	0	1	0	5	0	5	1	1	0	2
% App. Total	0	33.3	66.7		0	100	0		0	100	0		50	50	0	
PHF	.000	.250	.250	.375	.000	.250	.000	.250	.000	.417	.000	.417	.250	.250	.000	.500

Location: Signal Hill
N/S: Walnut Avenue
E/W: Hill Street

Date: 10/18/2018
Day: Thursday

PEDESTRIANS

Time	North Leg Walnut Avenue	East Leg Hill Street	South Leg Walnut Avenue	West Leg Hill Street	TOTAL
7:00 AM	2	1	0	0	3
7:15 AM	1	0	1	0	2
7:30 AM	1	1	1	3	6
7:45 AM	14	3	3	22	42
8:00 AM	30	20	6	28	84
8:15 AM	1	0	1	4	6
8:30 AM	1	3	0	1	5
8:45 AM	0	0	1	1	2
9:00 AM	2	2	2	0	6
9:15 AM	4	2	4	12	22
9:30 AM	4	2	2	18	26
9:45 AM	0	3	3	0	6
10:00 AM	0	3	2	3	8
10:15 AM	0	2	1	0	3
10:30 AM	0	0	0	0	0
10:45 AM	2	4	1	3	10
11:00 AM	3	0	0	2	5
11:15 AM	3	1	2	14	20
11:30 AM	3	1	0	4	8
11:45 AM	6	2	0	4	12
12:00 PM	6	0	2	9	17
12:15 PM	1	2	2	0	5
12:30 PM	4	2	0	2	8
12:45 PM	0	0	0	0	0
1:00 PM	1	0	0	3	4
1:15 PM	7	1	6	16	30
1:30 PM	26	10	5	30	71
1:45 PM	10	7	1	6	24
2:00 PM	2	0	2	3	7
2:15 PM	1	2	0	0	3
2:30 PM	2	2	2	2	8
2:45 PM	0	0	0	1	1
3:00 PM	0	0	1	0	1
3:15 PM	1	1	0	1	3
3:30 PM	0	0	2	0	2
3:45 PM	0	2	0	1	3
4:00 PM	0	0	1	0	1
4:15 PM	0	0	1	1	2
4:30 PM	0	0	1	1	2
4:45 PM	0	1	1	0	2
5:00 PM	3	3	4	0	10
5:15 PM	0	4	8	0	12
5:30 PM	1	0	1	2	4
5:45 PM	1	3	4	5	13
6:00 PM	0	0	5	2	7
6:15 PM	1	1	2	1	5
6:30 PM	4	1	2	1	8
6:45 PM	4	0	3	3	10
TOTAL VOLUMES:	152	92	86	209	539

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APPENDIX C

TRAFFIC SIGNAL WARRANT WORKSHEETS

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 1 of 5)

Count Date: 10/18/2018

City of Signal Hill — Jurisdiction
Walnut Ave/Hill St — Intersection
Calc: _____ Date: _____
Check: _____ Date: _____

Major St: Walnut Ave — Critical Approach Speed: 25 mph
Minor St: Hill St — Critical Approach Speed: N/A mph

☐ eed limit or critical speed on major street traffic > 40 mph .....
or
☐ built up area of isolated community of < 10,000 population ..... } RURAL (R)

☑ URBAN (U)

WARRANT 1 - Eight Hour Vehicular Volume

SATISFIED ☐ YES ☑ NO

(Condition A or Condition B or Combination of A and B must be satisfied)

Condition A - Minimum Vehicle Volume

100% SATISFIED ☐ YES ☑ NO
80% SATISFIED ☐ YES ☑ NO

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)												
	Urban	Rural	Urban	Rural									
APPROACH LANES	1		2 or More		5:00 PM	4:00 PM	1:00 PM	8:00 AM	7:00 AM	3:00 PM	12:00 PM	6:00 PM	Hour
Both Approaches Major Street	500 (400)	350 (280)	600 (480)	420 (336)	578	504	496	483	473	468	463	446	
Highest Approach Minor Street	150 (120)	105 (84)	200 (160)	140 (112)	119	117	119	265	137	184	119	125	

Condition B - Interruption of Continuous Traffic

100% SATISFIED ☐ YES ☑ NO
80% SATISFIED ☐ YES ☑ NO

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)												
	Urban	Rural	Urban	Rural									
APPROACH LANES	1		2 or More		5:00 PM	4:00 PM	1:00 PM	8:00 AM	7:00 AM	3:00 PM	12:00 PM	6:00 PM	Hour
Both Approaches Major Street	750 (600)	525 (420)	900 (720)	630 (504)	578	504	496	483	473	468	463	446	
Highest Approach Minor Street	75 (60)	53 (42)	100 (80)	70 (56)	119	117	119	265	137	184	119	125	

Combination of Conditions A & B

SATISFIED ☐ YES ☑ NO

REQUIREMENT	CONDITION	X	FULFILLED
TWO CONDITIONS SATISFIED 80%	A. Minimum Vehicular Volume		☐ YES ☑ NO
	AND, B. Interruption of Continuous Traffic		
AND, an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems			☐ YES ☑ NO

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 5)

WARRANT 2 - Four Hour Vehicular Volume

SATISFIED* ☐ YES ☑ NO

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	One	2 or More	8:00 AM	3:00 PM	5:00 PM	7:00 AM	Hour
Both Approaches - Major Street	X		483	468	578	473	
Higher Approach - Minor Street	X		265	184	119	137	

*All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS)	☐ YES	☑ NO
OR, All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS)	☐ YES	☑ NO

WARRANT 3 - Peak Hour

SATISFIED ☐ YES ☑ NO

(Part A or Part B must be satisfied)

PART A

SATISFIED ☐ YES ☑ NO

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	☐ YES	☑ NO
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND	☑ YES	☐ NO
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches	☑ YES	☐ NO

PART B

SATISFIED ☐ YES ☑ NO

APPROACH LANES	One	2 or More	8:00 AM
Both Approaches - Major Street	X		483
Higher Approach - Minor Street	X		265

The plotted point falls above the applicable curve in Figure 4C-3. (URBAN AREAS)	☐ YES	☑ NO
OR, The plotted point falls above the applicable curve in Figure 4C-4. (RURAL AREAS)	☐ YES	☑ NO

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 3 of 5)

WARRANT 4 - Pedestrian Volume
(Parts 1 and 2 Must Be Satisfied)

SATISFIED ☐ YES ☑ NO

Part 1 (Parts A or B must be satisfied)

A.

Hours - - - >	1:00 PM	8:00 AM	7:00 AM	9:00 AM
Vehicles per hour for any 4 hours	496	483	473	360
Pedestrians per hour for any 4 hours	73	57	30	39

Figure 4C-5 or Figure 4C-6
SATISFIED ☐ YES ☑ NO

B.

Hours - - - >	1:00 PM
Vehicles per hour for any 1 hour	496
Pedestrians per hour for any 1 hour	73

Figure 4C-7 or Figure 4C-8
SATISFIED ☐ YES ☑ NO

Part 2 **SATISFIED** ☑ YES ☐ NO

AND, The distance to the nearest traffic signal along the major street is greater than 300 ft.	☑ YES	☐ NO
OR, The proposed traffic signal will not restrict progressive traffic flow along the major street.	☐ YES	☑ NO

WARRANT 5 - School Crossing
(Part A and Part B must be satisfied)

SATISFIED ☐ YES ☑ NO

Part A **SATISFIED** ☐ YES ☑ NO

Gap/Minutes and # of Children — 12:00 AM — Hour

Gaps vs Minutes	Minutes Children Using Crossing	n/a
	Number of Adequate Gaps	n/a
School Age Pedestrians Crossing Street / hr		0

Gaps < Minutes ☐ YES ☐ NO
AND Children > 20/hr ☑ YES ☐ NO

AND Consideration has been given to less restrictive remedial measures.*	☐ YES	☑ NO

Existing adult crossing guard ensures adequate gaps are provided.

Part B **SATISFIED** ☑ YES ☐ NO

The distance to the nearest traffic signal along the major street is greater than 300 ft.	☑ YES	☐ NO
OR, The proposal signal will not restrict the progressive movement of traffic.	☐ YES	☐ NO

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 4 of 5)

WARRANT 6 - Coordinated Signal System **SATISFIED** ☐ YES ☑ NO
(All Parts Must Be Satisfied)

Minimum Requirements	DISTANCE TO NEAREST SIGNAL				
≥ 1000 ft.	N **N/A**	S **N/A**	E **N/A**	W **N/A**	☐ YES ☑ NO
On a one-way street or a street that has traffic predominantly in any direction, the adjacent traffic control signals are so far apart that they do not provide the necessary degree of vehicular platooning.					
OR, On a two-way street, adjacent traffic control signal do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive operation.					☐ YES ☑ NO

WARRANT 7 - Crash Experience Warrant **SATISFIED** ☐ YES ☑ NO
(All Parts Must Be Satisfied)

Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency.			☐ YES ☑ NO
REQUIREMENTS	Number of crashes reported within a 12 month period susceptible to correction by a traffic signal, and involving injury or damage exceeding the requirements for a reportable crash.		☐ YES ☑ NO
5 OR MORE	**2**		
REQUIREMENTS	CONDITIONS	✓	
ONE CONDITION SATISFIED 80%	Warrant 1, Condition A - Minimum Vehicular Volume		☐ YES ☑ NO
	OR, Warrant 1, Condition B - Interruption of Continuous Traffic		
	OR, Warrant 4, Pedestrian Volume Condition - Ped Vol ≥ 152 for any hour OR, Ped Vol ≥ 80 for any 4 hours		

WARRANT 8 - Roadway Network **SATISFIED** ☐ YES ☑ NO
(All Parts Must Be Satisfied)

Minimum Volume REQUIREMENTS	ENTERING VOLUMES - ALL APPROACHES		✓	FUFILLED
1000 Veh/Hr	During Typical Weekday Peak Hour **912** Veh/Hr and has 5-year projected traffic volumes that meet one or more of Warrants 1, 2, and 3 during an average weekday			☐ Yes ☑ No
	OR During Each of Any 5 Hrs. of a Sat or Sun **0** Veh/Hr			
CHARACTERISTICS OF MAJOR ROUTES		MAJOR ROUTE A	MAJOR ROUTE B	
Hwy. System Serving as Principal Network for Through Traffic				
Rural or Suburban Highway Outside Of, Entering, or Traversing a City				
Appears as Major Route on an Official Plan				
Any Major Route Characteristics Met, Both Streets				☐ Yes ☑ No

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 5 of 5)

WARRANT 9 - Intersection Near a Grade Crossing (Both Parts A and B Must Be Satisfied) N/A **SATISFIED** ☐ YES ☑ NO

PART A

A grade crossing exists on an approach controlled by a STOP or YIELD sign and the center of the track nearest to the intersection is within 140 feet of the stop line or yield line on the approach. Track Center Line to Limit Line 0 ft.

☑ YES ☐ NO

PART B

There is one minor street approach lane at the track crossing - During the highest traffic volume hour during which rail traffic uses the crossing, the plotted point falls above the applicable curve in Figure 4C-9.

Major Street - Total of both approaches: 0 VPH

Minor Street - Crosses the track (one direction only, approaching the intersection):

0 VPH X AF (Use Table 4C-2, 3 & 4 below to calculate AF) = 0 VPH

OR, There are two or more minor street approach lanes at the track crossing -

During the highest traffic volume hour during which rail traffic uses the crossing, the plotted point falls above the applicable curve in Figure 4C-10.

☐ YES ☐ NO

Major Street - Total of both approaches: 0 VPH

Minor Street - Crosses the track (one direction only, approaching the intersection):

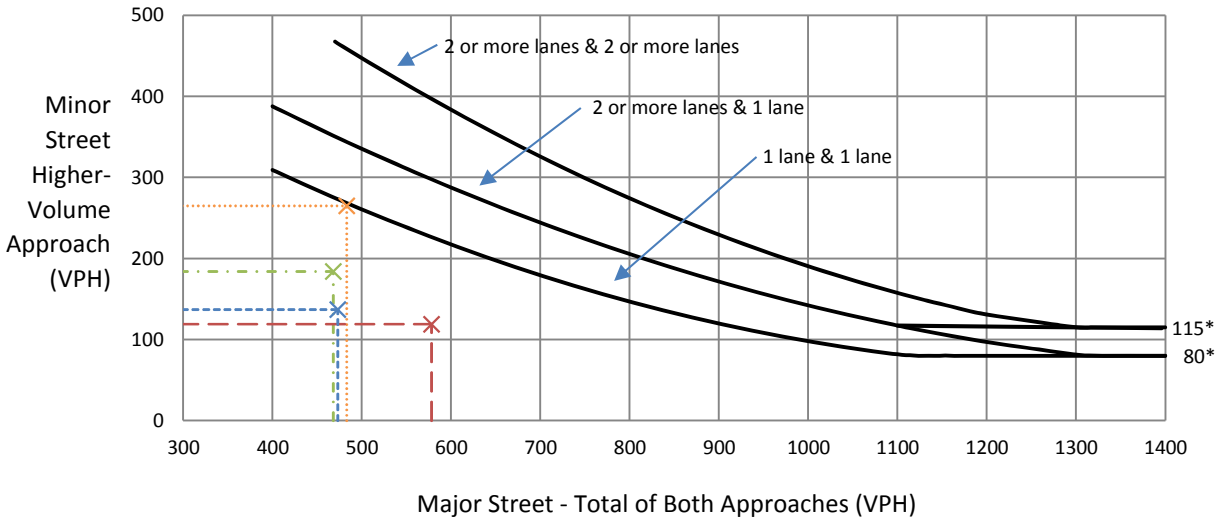
0 VPH X AF (Use Tables 4C-2, 3, & 4 below to calculate AF) = 0 VPH

The minor street approach volume may be multiplied up to three following adjustment factors (AF) as described in Section 4C.10.

1- Number of Rail Traffic per Day	0	Adjustment factor from table 4C-2	0
2- Percentage of High-Occupancy Buses on Minor Street Approach	0	Adjustment factor from table 4C-3	0
3- Percentage of Tractor-Trailer Trucks on Minor Street Approach	0	Adjustment factor from table 4C-4	0

NOTE: If no data is available or know, then use AF = 1 (no adjustment)

Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



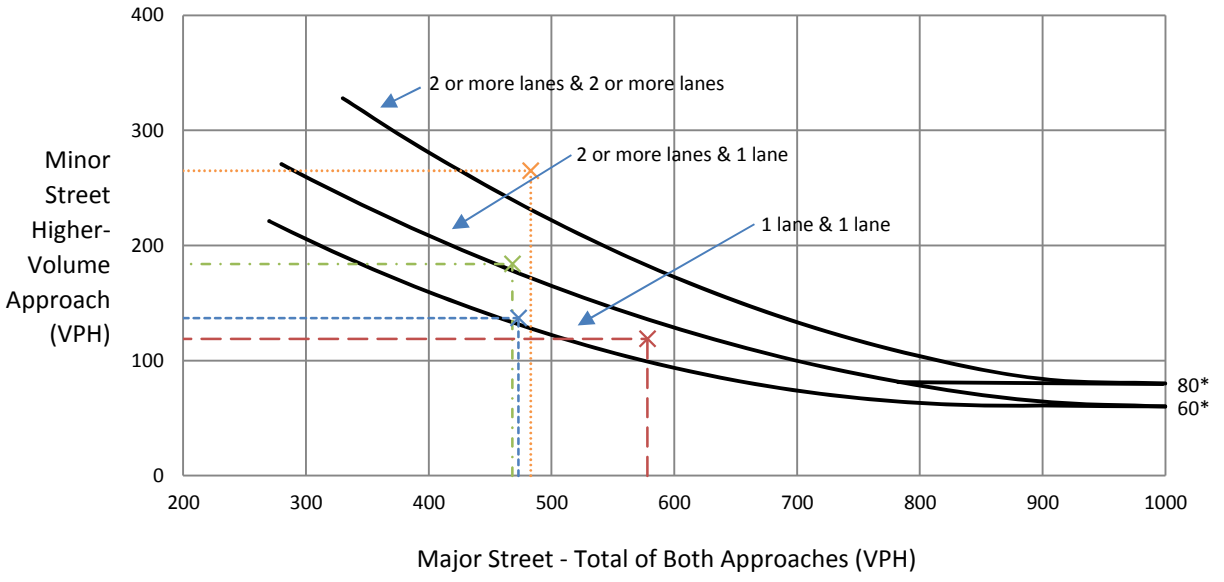
Traffic Signal Warrant Is NOT Satisfied

*Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor street approach with one lane.

**CAUTION: One or more points are within the margin of error (within 5 vehicles of the curve).

Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

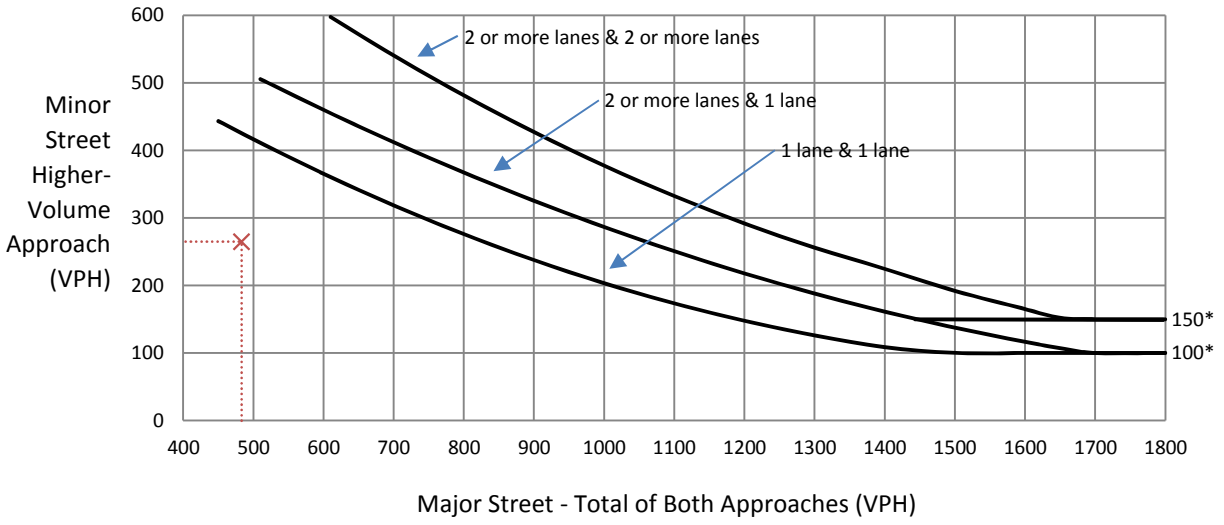
(Community less than 10,000 population or above 40 mph on the major street)



This figure is not applicable; see Figure 4C-1 above.

*Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure 4C-3. Warrant 3, Peak Hour Vehicular Volume

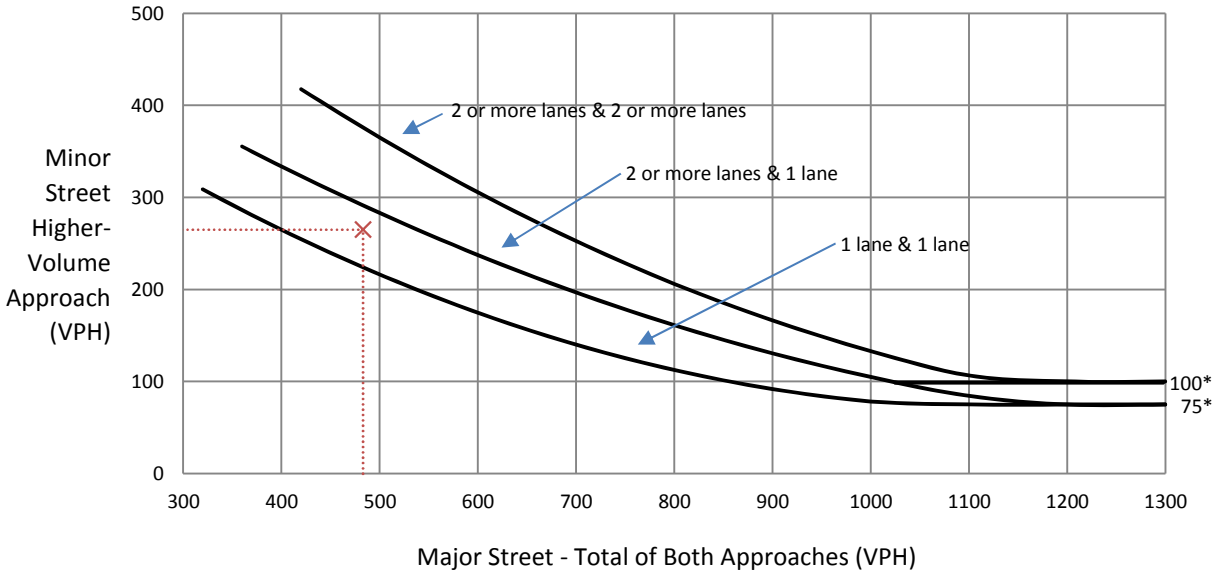


Traffic Signal Warrant Is NOT Satisfied

*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour Vehicular Volume (70% Factor)

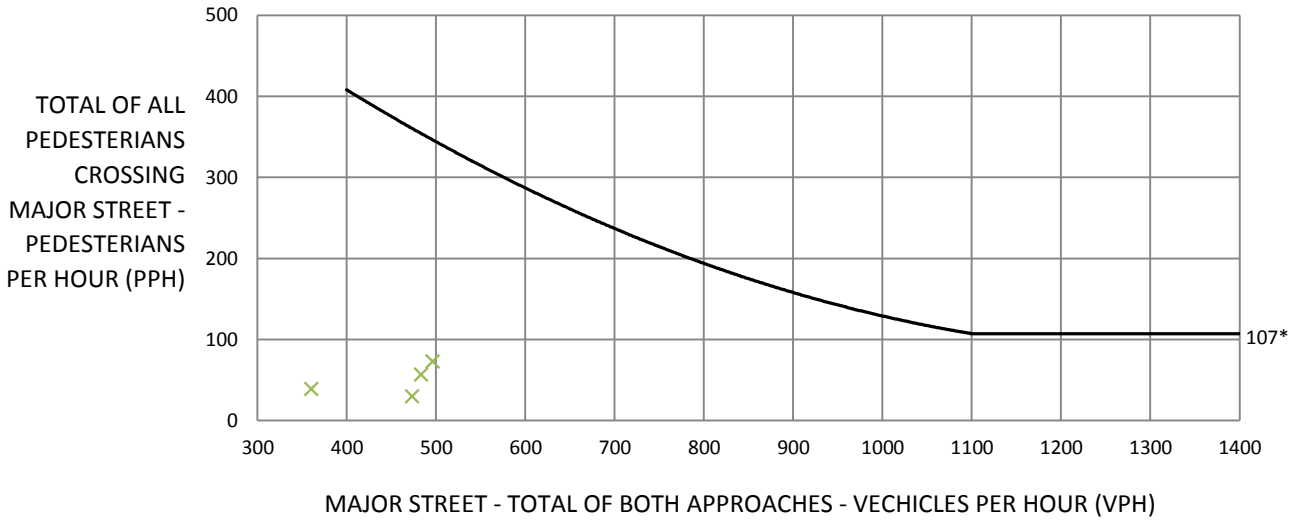
(Community less than 10,000 population or above 40 mph on the major street)



This figure is not applicable; see Figure 4C-3 above.

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

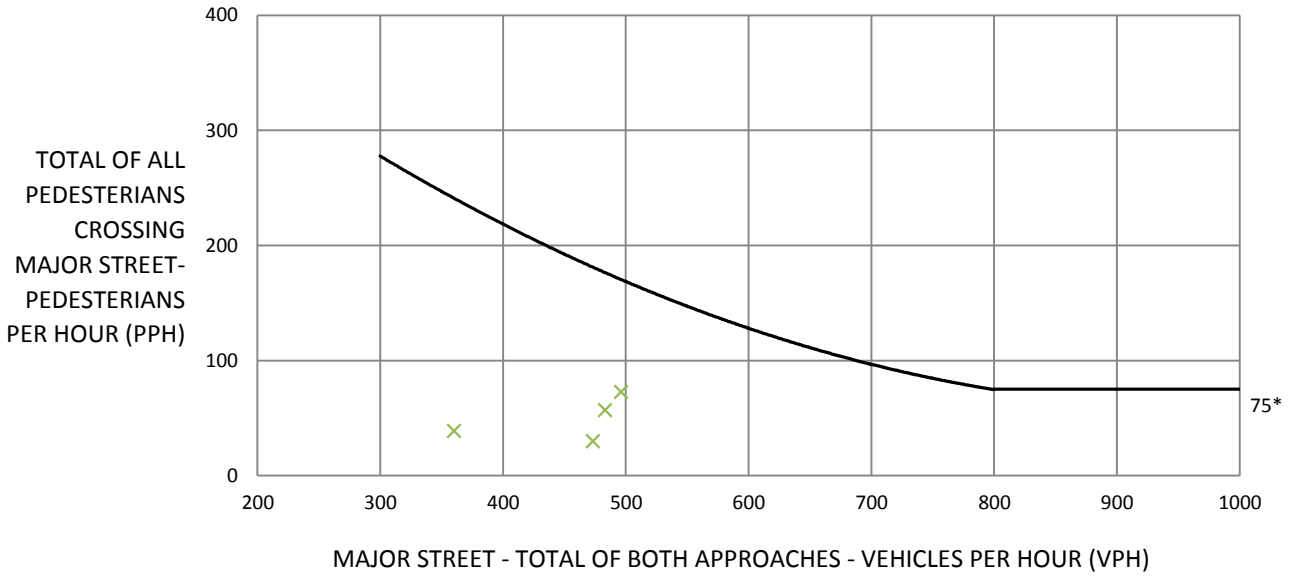
Figure 4C-5. Warrant 4, Pedestrian Four-Hour Volume



Traffic Signal Warrant Is NOT Satisfied

*Note: 107 pph applies as the lower threshold volume.

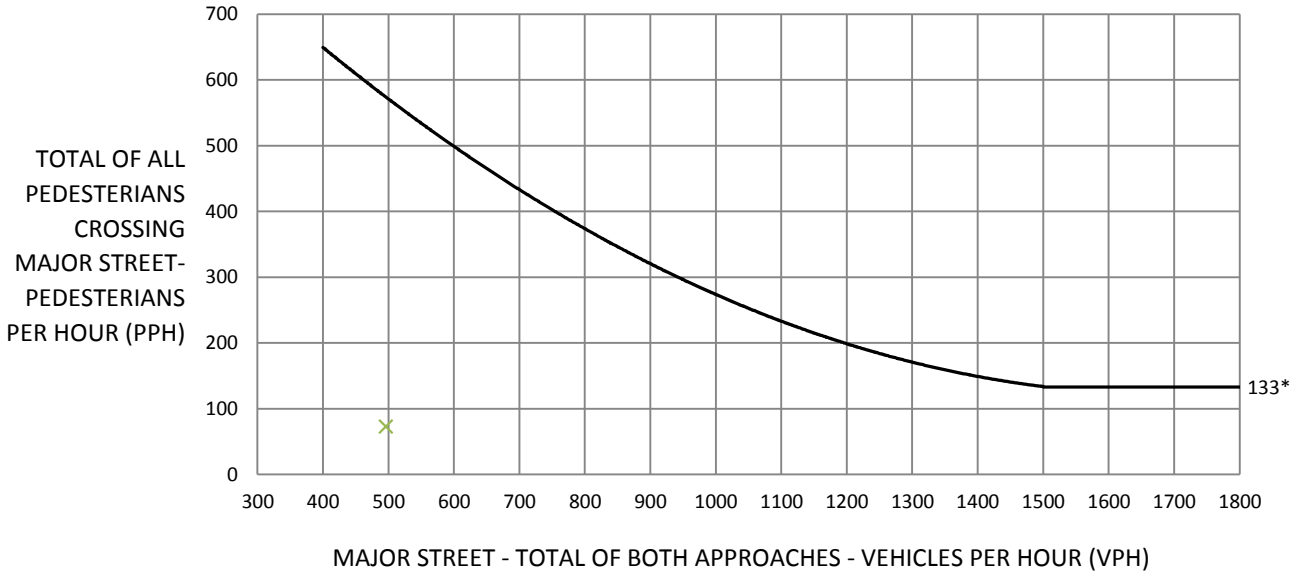
Figure 4C-6. Warrant 4, Pedestrian Four-Hour Volume (70% Factor)



This figure is not applicable; see Figure 4C-5 above.

*Note: 75 pph applies as the lower threshold volume.

Figure 4C-7. Warrant 4, Pedestrian Peak Hour



Traffic Signal Warrant Is NOT Satisfied

*Note: 133 pph applies as the lower threshold volume.

Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)



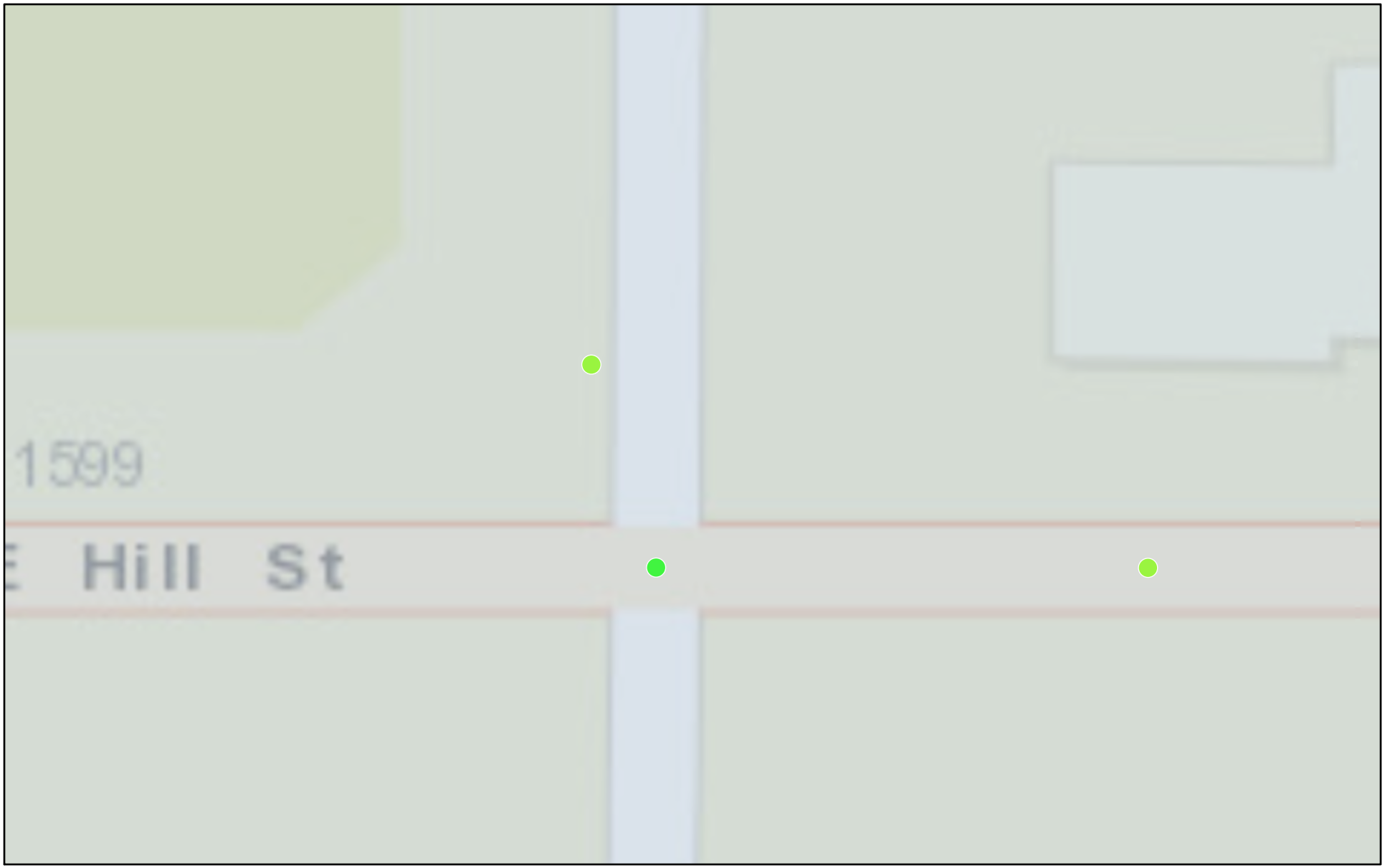
This figure is not applicable; see Figure 4C-7 above.

*Note: 93 pph applies as the lower threshold volume.

APPENDIX D

COLLISION RECORDS

SWITRS GIS Map: Los Angeles, Signal Hill 01/01/2013 - 12/31/2017



November 6, 2018

1:282

0 0 0 0.01 mi

0 0 0.01 0.01 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan,

Made by: SWITRS GIS Map at TIMS (https://tims.berkeley.edu), SafeTREC,
Copyright © 2018 UC Regents; all rights reserved.

Collision Details for: Case ID 7167369

Collision Information

County	Los Angeles
City	Signal Hill
Date & Time (M/D/Y HH:MM)	01/05/2016 08:40
Location (Intersection)	Hill & Walnut Av
Dist. & Dir. from Intersection	0.00 ft East
State Highway	No
Latidude & Longitude	33.79713011, -118.17202012

Type of Collision	D - Broadside	**Motor Vehicle Involved With**	C - Other Motor Vehicle
Collision Severity	4 - Injury (Complaint of Pain)	**Pedestiran Accident**	No
PCF Violation Category	09 - Automobile Right of Way	**Bicycle Accident**	No
Weather	C - Raining	**Motorcycle Accident**	No
Alcohol Involved	No	**Truck Accident**	No

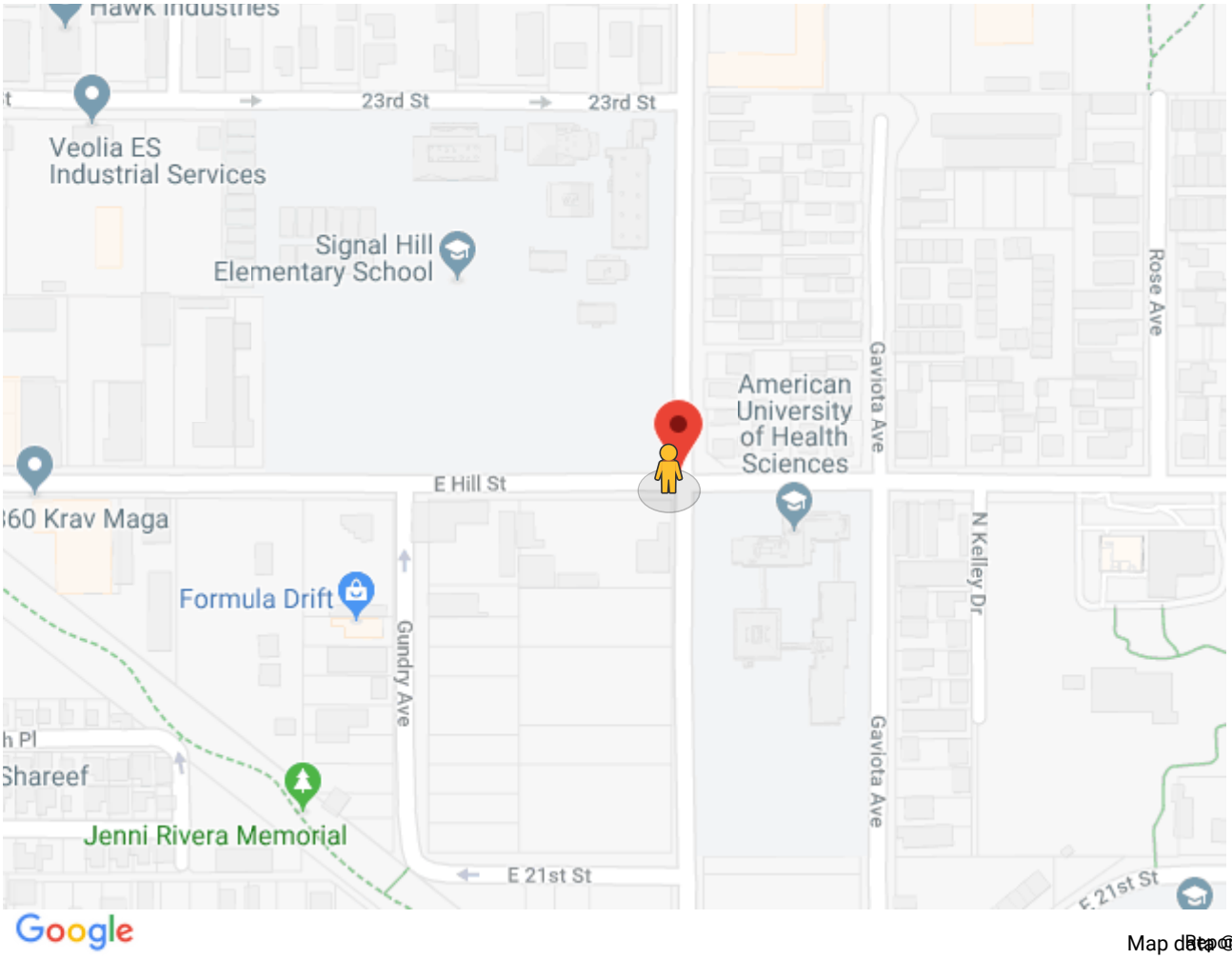
Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	East	B - Proceeding Straight
2	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	South	B - Proceeding Straight

Victims: 4

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	2 - Passenger	F - Female	11	0 - No Injury
2	2 - Passenger	F - Female	14	4 - Complaint of Pain
2	2 - Passenger	F - Female	12	0 - No Injury
2	2 - Passenger	M - Male	12	0 - No Injury

Map View



Map data ©2018 Google

Street View

1598 E Hill St
Signal Hill, California
View on Google Maps

Collision Details for: Case ID 6234458

Collision Information

County	Los Angeles
City	Signal Hill
Date & Time (M/D/Y HH:MM)	09/14/2013 17:52
Location (Intersection)	Walnut Av & Hill
Dist. & Dir. from Intersection	38.00 ft North
State Highway	No
Latidude & Longitude	33.797209, -118.1720504

Type of Collision	C - Rear End	**Motor Vehicle Involved With**	C - Other Motor Vehicle
Collision Severity	4 - Injury (Complaint of Pain)	**Pedestiran Accident**	No
PCF Violation Category	03 - Unsafe Speed	**Bicycle Accident**	No
Weather	A - Clear	**Motorcycle Accident**	No
Alcohol Involved	No	**Truck Accident**	No

Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	Yes	South	H - Slowing/Stopping
2	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	South	A - Stopped

Victims: 5

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
2	1 - Driver	F - Female	29	4 - Complaint of Pain
2	2 - Passenger	M - Male	47	0 - No Injury
2	2 - Passenger	M - Male	7	0 - No Injury
2	2 - Passenger	M - Male	2	0 - No Injury
2	2 - Passenger	F - Female	5	0 - No Injury

Map View



Street View

2201 N Walnut Ave
Signal Hill, California
View on Google Maps

Collision Details for: Case ID 8439941

Collision Information

County	Los Angeles
City	Signal Hill
Date & Time (M/D/Y HH:MM)	08/18/2017 11:54
Location (Intersection)	Hill & Walnut Av
Dist. & Dir. from Intersection	70.00 ft East
State Highway	No
Latidude & Longitude	33.79713, -118.17179007

Type of Collision	C - Rear End	**Motor Vehicle Involved With**	E - Parked Motor Vehicle
Collision Severity	4 - Injury (Complaint of Pain)	**Pedestiran Accident**	Yes
PCF Violation Category	18 - Other Than Driver (or Pedestrian)	**Bicycle Accident**	No
Weather	A - Clear	**Motorcycle Accident**	No
Alcohol Involved	No	**Truck Accident**	No

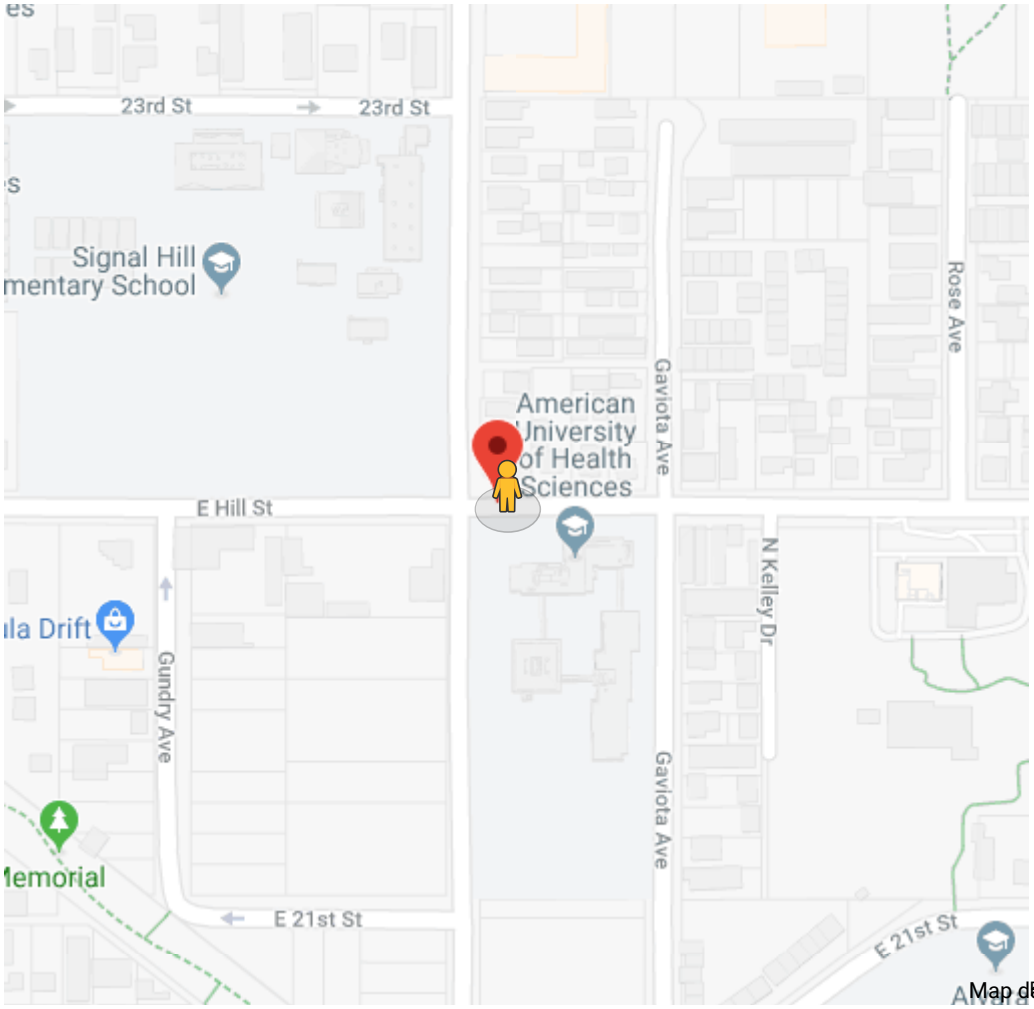
Parties: 3

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	East	B - Proceeding Straight
2	3 - Parked Vehicle	A - Passenger Car/Station Wagon	No	East	O - Parked
3	2 - Pedestrian	N - Pedestrian	No	East	- - Not Stated

Victims: 2

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	1 - Driver	F - Female	66	4 - Complaint of Pain
3	3 - Pedestrian	F - Female	25	4 - Complaint of Pain

Map View



Street View

1609 E Hill St
Signal Hill, California
View on Google Maps

January 1, 2018 - November 2, 2018

Case ID	Year	Date	Time	Primary Road	Secondary Road	Distance	Direction	Inter-section?	Severity	# Killed	# Injured	Primary Collision Factor	Type of Collision	MVIW
8575922	2018	20180303	2125	WALNUT AV	28TH	92	N	N	0	0	0	A	D	C
8575926	2018	20180305	2047	WALNUT AV	HILL	0		Y	0	0	0	D	D	C
8581623	2018	20180311	1643	WALNUT AV	SPRING	175	S	N	0	0	0	A	C	E
8609421	2018	20180415	1646	WALNUT AV	HILL	180	S	N	3	0	1	A	B	E
8644588	2018	20180611	1135	WALNUT AV	HILL ST	0		Y	3	0	1	A	D	C
8693361	2018	20180825	1530	WALNUT AV	WILLOW	97	S	N	3	0	1	A	D	C
8707351	2018	20180913	1545	WALNUT AV	WILLOW	40	S	N	4	0	1	A	C	C
8708906	2018	20180929	49	WALNUT AV	28TH ST	202	S	N	3	0	1	A	E	I

APPENDIX E

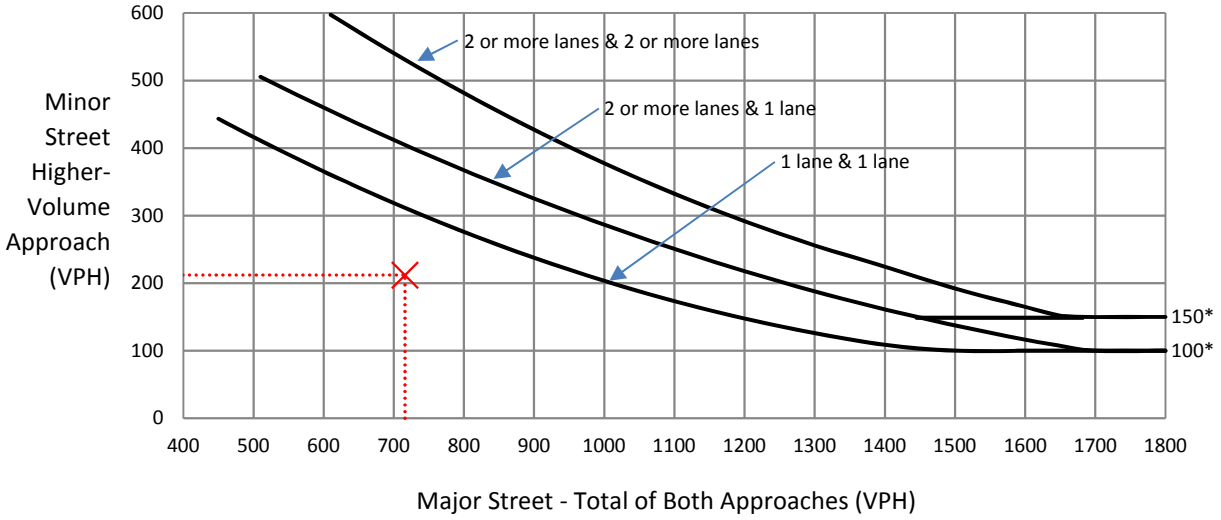
FUTURE CONDITIONS
PEAK HOUR TRAFFIC SIGNAL WARRANT WORKSHEETS

Figure E-1

Walnut Ave (NS) / Hill St (EW) - #10
General Plan Buildout With Project
AM Peak Hour

Major Street:	Walnut Ave	Volume:	716
Minor Street:	Hill St	Volume:	212

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

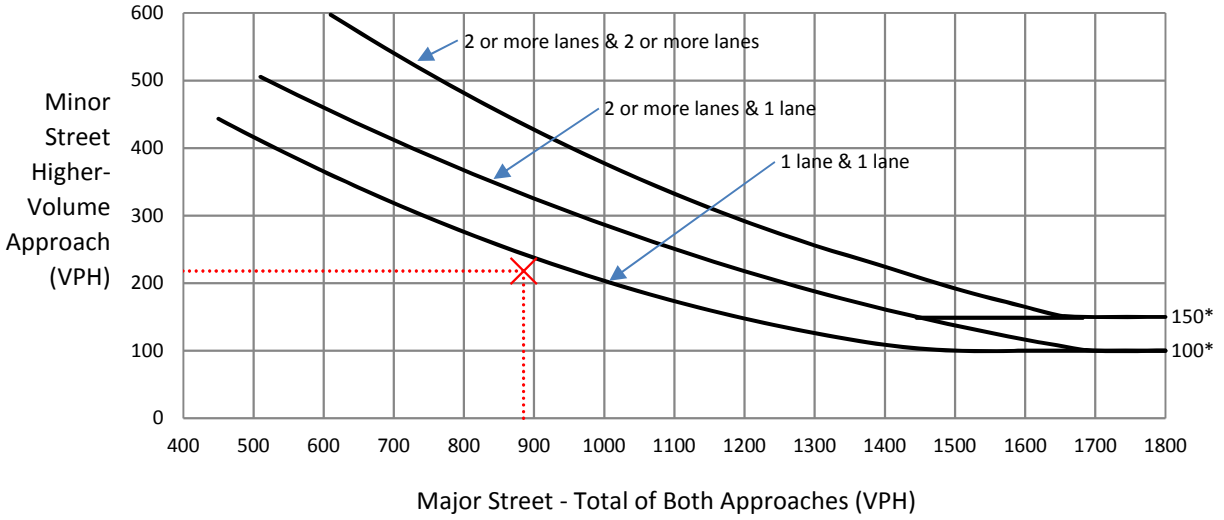
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure E-2

Walnut Ave (NS) / Hill St (EW) - #10
General Plan Buildout With Project
School PM Peak Hour

Major Street:	Walnut Ave	Volume:	885
Minor Street:	Hill St	Volume:	218

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

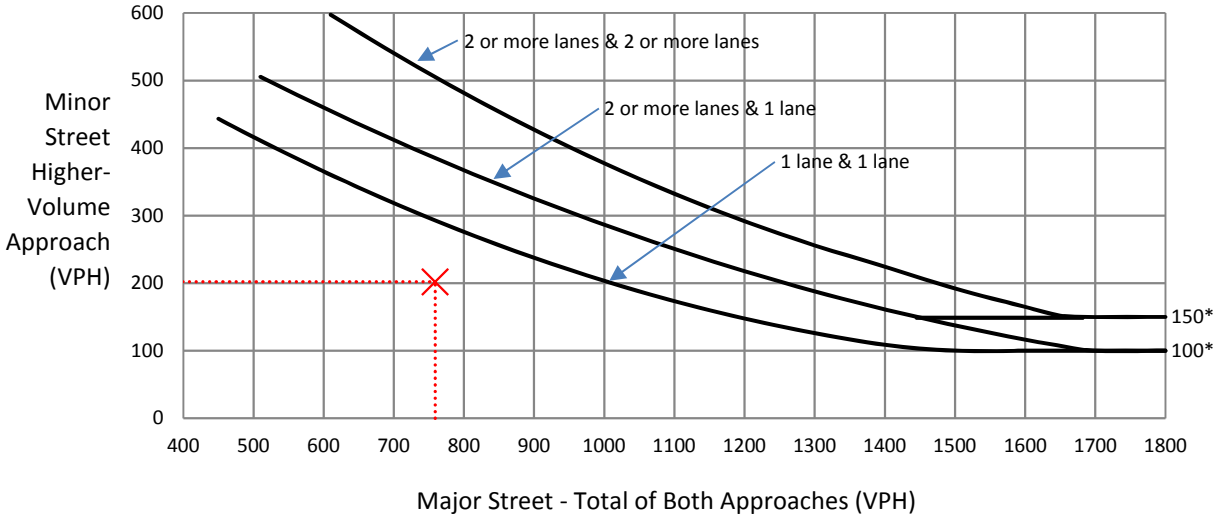
*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

Figure E-3

Walnut Ave (NS) / Hill St (EW) - #10
General Plan Buildout With Project
PM Peak Hour

Major Street:	Walnut Ave	Volume:	759
Minor Street:	Hill St	Volume:	202

Warrant 3, Peak Hour Vehicular Volume (100% Factor)



Traffic Signal Warrant Is NOT Satisfied

*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

May 11, 2021

Ms. Colleen Doan
CITY OF SIGNAL HILL
2175 Cherry Avenue
Signal Hill, California 90755

RE: Signal Hill Business Center Sensitivity Analysis for Updated Existing and Opening Year Conditions
Project No. 18-0056

Dear Ms. Doan:

Ganddini Group, Inc. is pleased to submit this letter regarding adequacy of the previously completed *Signal Hill Business Center Traffic Impact Analysis* (July 2019), *Supplemental Afternoon School Peak Hour Analysis* (May 2018), and the *Signal Hills Business Center Supplemental Traffic Analysis* (July 2019). Since these studies include analysis of potential project-related transportation deficiencies during future year 2040 conditions, the analyses and findings presented therein are still sufficient. Even if the project opening year is later than originally anticipated, the project's impact relative to the City's operational standards would be no worse than those identified for year 2040 conditions for which corrective measures were identified and would still be applicable.

The purpose of this letter is to provide a sensitivity analysis to quantitatively document that the analyses presented in earlier studies are still sufficient.

UPDATED EXISTING AND OPENING YEARS

The traffic studies referenced above are based on existing conditions established in 2018 and future project opening year of 2020. As a result of entitlement delays, a focused traffic analysis was prepared for a revised existing year 2021 and project opening year in 2023.

Consistent with the annual growth rate used in the original traffic studies, the existing 2018 traffic volume counts were increased by one percent (1%) per year over a three-year period for the revised 2021 existing conditions and one percent (1%) per year over a five-year period for the revised 2023 opening year conditions. This equates to a total growth factor of approximately 1.03 for existing 2021 conditions and 1.05 for opening year 2023 conditions.

New traffic counts were not collected due to the effect of the COVID-19 pandemic on traffic volumes. During the early weeks of the "stay-at-home" orders relating to the pandemic, passenger car travel generally decreased by approximately 40 percent. Although traffic volumes have seen a return conditions vary by region and locality, passenger car travel is still generally 10 percent lower compared to 2019 levels as of April 2021.[1] Therefore, the following analysis is intended to reflect a conservative assessment of current year 2021 conditions had the COVID-19 pandemic never occurred and traffic volumes continued to increase as normal.

[1] Pozlin, Steven. "Post-COVID-19 Transportation Trends." ITE Journal, April 2021, pp. 38-44.

OPERATIONAL IMPACT CRITERIA

Per City of Signal Hill traffic study criteria, the intersection improvement requirement should include (all) following elements:

- Drop of 0.02 (2%) in Level of Service (LOS) (i.e., Intersection Capacity Utilization [ICU]); or
- 40 vehicles added to an intersection; or
- Left-turn queue length is greater than the existing storage length.

OPERATIONAL IMPACT ASSESSMENT

Criterion 1 – Drop of 0.02 in Level of Service

Based on the updated existing year 2021 and opening year 2023 conditions, a focused level of service analysis was performed for the intersection of Orange Avenue and Willow Street (study intersection #2). This intersection was selected on the basis that it was previously calculated to be the worst-performing study intersection at a peak hour volume-to-capacity ratio of 0.846 with Level of Service D.

Table 1 shows the focused significant impact evaluation for the updated existing 2021 and opening year 2023 conditions. As shown in Table 1, the addition of project trips is forecast to increase the study intersection volume-to-capacity ratio by less than 0.02 during the peak hours for the updated Existing (2021) Plus Project and Opening Year (2023) With Project conditions. Level of Service worksheets are provided in Attachment A.

Table 1
Level of Service Evaluation

	Without Project				With Project				Change in V/C		Significant Impact?
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour	PM Peak Hour	
ID Study Intersection	V/C[1]	LOS	V/C[1]	LOS	V/C[1]	LOS	V/C[1]	LOS			
2. Orange Ave at Willow St											
Existing (2021)	0.752	C	0.869	D	0.767	C	0.888	D	0.015	0.019	NO
Opening Year (2023)	0.783	C	0.895	D	0.792	C	0.914	E	0.009	0.019	NO

Notes:
V/C = Volume-to-Capacity ratio

Since the project causes less than 0.02 drop in intersection capacity utilization, the project LOS impact is considered less than significant and no improvements are required.

Criterion 2 – 40 Vehicles Added to a Study Intersection

Table 2 shows the project peak hour trip contribution at the study intersection of Orange Avenue and Willow Street.

Table 2
Project Trip Contribution

ID	Study Intersection	Peak Hour Project Trips		40 or More Trips Added?	Improvements Required?
		AM	PM		
2.	Orange Ave at Willow St	60	62	Yes	Yes - update signal timing.

As shown in Table 2, the project is forecast to add 60 trips during the AM peak hour and 62 trips during the PM peak hour at the study intersection of Orange Avenue and Willow Street and therefore exceeds the threshold for improvements. This impact was previously identified in the July 2019 analysis along with the corresponding requirement for the project to contribute a fair share payment toward signal timing updates. Therefore, no new impacts or improvements would occur in relation to this criterion beyond those previously identified as a result of the updated analysis years.

Criterion 3 – Left-Turn Queue Exceeds Storage Length

Table 3 summarizes the left-turn lane storage lengths and the corresponding queue length during the AM and PM peak hours for study intersection left turn movements where to project is forecast to add trips. The queue length was calculated in accordance with the Highway Capacity Manual (6th Edition) back-of-queue methodology for the 95th-percentile queue length. Queue lengths are reported in the HCM worksheets provided in Attachment B.

Table 3
Left-Turn Lane Queue Length Evaluation

ID	Study Intersection	Movement[1]	Storage Length[2]	95th-Percentile Queue Length (Feet)		Adequate Storage Length?
				AM	PM	
2.	Orange Ave at Willow St	NBL	145+			
	Existing (2021) Plus Project			36	38	Yes
	Opening Year (2023) With Project			39	46	Yes

Notes:
1. NB = Northbound; L = Left.
2. As measured from limit line to mid-point of left-turn bay taper. "+" symbol indicates additional storage is available within the painted median.

As shown in Table 3, adequate left-turn storage is forecast to be provided at the study intersection during the peak hours for the updated Existing (2021) Plus Project and Opening Year (2023) With Project conditions.

PROJECT IMPROVEMENTS

The July 2019 analysis identified that the project should provide a fair share contribution toward signal timing updates at the intersection of Orange Avenue and Willow Street. Although the proposed project does not exceed the threshold of causing a two percent drop in intersection capacity utilization, the applicant has

agreed to pay for the full cost of signal timing improvements at the intersection of Orange Avenue and Willow Street to address the change from Level of Service D to E that is forecast to occur with the addition of project trips under the updated Opening Year 2023 conditions.

It is noted that the Opening Year analysis includes background growth and trips generated by other developments. Therefore, the project impact is the result of cumulative traffic that pushes performance of the Orange Avenue and Willow Street intersection near the Level of Service D threshold such that a small contribution (less than 2%) degrades the intersection to Level of Service E. Typically, this would be considered a cumulative impact for which the project would contribute a fair share.

The intersection of Orange Avenue and Willow Street is forecast to operate at Level of Service C assuming implementation of optimized signal timing as shown on the HCM worksheets provided in Attachment B. Therefore, the project's contribution toward the full cost of signal timing improvements at the intersection of Orange Avenue and Willow Street would maintain the City-established performance standards.

CONCLUSIONS

Actual passenger travel has not continued to increase in accordance with past historical trends and is generally still below average 2019 levels. Nevertheless, a sensitivity analysis was performed to review potential Level of Service impacts associated with updated existing baseline and opening years assuming traffic growth had continued in accordance with historical trends pre-COVID 19.

Based on a sensitivity analysis of all three of the City-established operational impact criteria at the worst-performing study intersection, the proposed project is forecast to result in no new impacts or require additional improvements beyond those previously identified as a result of the updated analysis years. Therefore, it can reasonably be concluded that the project impact at other study intersections would be the same as previously identified in the original traffic studies.

Although the proposed project does not exceed the threshold of causing a two percent drop in intersection capacity utilization, the applicant has agreed to pay for the full cost of signal timing improvements at the intersection of Orange Avenue and Willow Street to address the change from Level of Service D to E that is forecast to occur with the addition of project trips under the updated Opening Year 2023 conditions.

We appreciate the opportunity to assist you on this project. Should you have any questions or if we can be of further assistance, please do not hesitate to call at (714) 795-3100.

Sincerely,
GANDDINI GROUP, INC.



Giancarlo Ganddini, PE, PTP
Principal

copy to:
Randy Nichols, Michael Baker International

ATTACHMENT A

LEVEL OF SERVICE WORKSHEETS

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.752

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	82	492	92	40	439	83	84	931	72	69	1128	62
Base Volume Adjustment Factor	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	84	507	95	41	452	86	87	959	74	71	1162	64
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	127	24	10	113	22	22	240	19	18	291	16
Total Analysis Volume [veh/h]	84	507	95	41	452	86	87	959	74	71	1162	64
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.32	0.00	0.03	0.28	0.05	0.05	0.22	0.22	0.04	0.26	0.26
Intersection LOS	C											
Intersection V/C	0.752											

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.869

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	460	101	73	500	67	89	1451	74	135	1077	81
Base Volume Adjustment Factor	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	53	474	104	75	515	69	92	1495	76	139	1110	83
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	119	26	19	129	17	23	374	19	35	278	21
Total Analysis Volume [veh/h]	53	474	104	75	515	69	92	1495	76	139	1110	83
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.30	0.00	0.05	0.32	0.04	0.06	0.33	0.33	0.09	0.25	0.25
Intersection LOS	D											
Intersection V/C	0.869											

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.767

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	82	492	92	40	439	83	84	931	72	69	1128	62
Base Volume Adjustment Factor	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	4	5	0	0	31	0	0	0	20	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	88	512	95	41	483	86	87	959	94	71	1162	64
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	128	24	10	121	22	22	240	24	18	291	16
Total Analysis Volume [veh/h]	88	512	95	41	483	86	87	959	94	71	1162	64
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.32	0.00	0.03	0.30	0.05	0.05	0.22	0.22	0.04	0.26	0.26
Intersection LOS	C											
Intersection V/C	0.767											

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.888

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	460	101	73	500	67	89	1451	74	135	1077	81
Base Volume Adjustment Factor	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	18	27	0	0	10	0	0	0	7	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	71	501	104	75	525	69	92	1495	83	139	1110	83
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	125	26	19	131	17	23	374	21	35	278	21
Total Analysis Volume [veh/h]	71	501	104	75	525	69	92	1495	83	139	1110	83
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.31	0.00	0.05	0.33	0.04	0.06	0.33	0.33	0.09	0.25	0.25
Intersection LOS	D											
Intersection V/C	0.888											

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.783

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	82	492	92	40	439	83	84	931	72	69	1128	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	7	0	8	5	2	4	30	1	0	16	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	87	524	97	50	466	89	92	1008	77	73	1202	78
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	131	24	13	117	22	23	252	19	18	301	20
Total Analysis Volume [veh/h]	87	524	97	50	466	89	92	1008	77	73	1202	78
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.33	0.00	0.03	0.29	0.06	0.06	0.23	0.23	0.05	0.27	0.27
Intersection LOS	C											
Intersection V/C	0.783											

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.895

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	460	101	73	500	67	89	1451	74	135	1077	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	7	0	16	7	5	3	22	1	0	29	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	55	490	106	93	533	75	97	1547	79	142	1161	93
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	123	27	23	133	19	24	387	20	36	290	23
Total Analysis Volume [veh/h]	55	490	106	93	533	75	97	1547	79	142	1161	93
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.31	0.00	0.06	0.33	0.05	0.06	0.34	0.34	0.09	0.26	0.26
Intersection LOS	D											
Intersection V/C	0.895											

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.792

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	82	492	92	40	439	83	84	931	72	69	1128	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	12	0	8	36	2	4	30	21	0	16	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	529	97	50	497	89	92	1008	97	73	1202	78
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	132	24	13	124	22	23	252	24	18	301	20
Total Analysis Volume [veh/h]	91	529	97	50	497	89	92	1008	97	73	1202	78
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.33	0.00	0.03	0.31	0.06	0.06	0.23	0.23	0.05	0.27	0.27
Intersection LOS	C											
Intersection V/C	0.792											

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.914

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	460	101	73	500	67	89	1451	74	135	1077	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	19	34	0	16	17	5	3	22	8	0	29	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	73	517	106	93	543	75	97	1547	86	142	1161	93
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	129	27	23	136	19	24	387	22	36	290	23
Total Analysis Volume [veh/h]	73	517	106	93	543	75	97	1547	86	142	1161	93
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.32	0.00	0.06	0.34	0.05	0.06	0.34	0.34	0.09	0.26	0.26
Intersection LOS	E											
Intersection V/C	0.914											

ATTACHMENT B

HCM WORKSHEETS FOR QUEUING ANALYSIS

Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	25.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.650

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	82	492	92	40	439	83	84	931	72	69	1128	62
Base Volume Adjustment Factor	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	4	5	0	0	31	0	0	0	20	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	88	512	95	41	483	86	87	959	94	71	1162	64
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	128	24	10	121	22	22	240	24	18	291	16
Total Analysis Volume [veh/h]	88	512	95	41	483	86	87	959	94	71	1162	64
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	21	0	11	21	0	17	27	0	11	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	70	70	70	70	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	33	25	33	23	23	6	20	20	5	19	19
g / C, Green / Cycle	0.47	0.36	0.47	0.33	0.33	0.08	0.28	0.28	0.08	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.08	0.27	0.04	0.25	0.05	0.05	0.19	0.19	0.04	0.22	0.22
s, saturation flow rate [veh/h]	1136	1900	1066	1900	1615	1810	3618	1815	1810	3618	1850
c, Capacity [veh/h]	482	684	446	633	538	151	1008	505	139	984	503
d1, Uniform Delay [s]	12.21	19.70	12.01	20.94	16.49	31.01	22.68	22.69	31.16	24.00	24.01
k, delay calibration	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.83	7.36	0.09	8.47	0.63	3.45	0.88	1.75	2.89	1.82	3.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.18	0.75	0.09	0.76	0.16	0.58	0.70	0.70	0.51	0.82	0.82
d, Delay for Lane Group [s/veh]	13.04	27.07	12.10	29.41	17.13	34.46	23.56	24.44	34.05	25.82	27.49
Lane Group LOS	B	C	B	C	B	C	C	C	C	C	C
Critical Lane Group	Yes	No	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.79	8.10	0.32	8.02	1.01	1.51	4.97	5.13	1.23	6.15	6.53
50th-Percentile Queue Length [ft/ln]	19.80	202.53	7.99	200.52	25.28	37.86	124.35	128.13	30.72	153.80	163.17
95th-Percentile Queue Length [veh/ln]	1.43	12.77	0.58	12.67	1.82	2.73	8.63	8.84	2.21	10.22	10.72
95th-Percentile Queue Length [ft/ln]	35.64	319.23	14.39	316.64	45.50	68.15	215.79	220.95	55.29	255.50	267.92

Movement, Approach, & Intersection Results

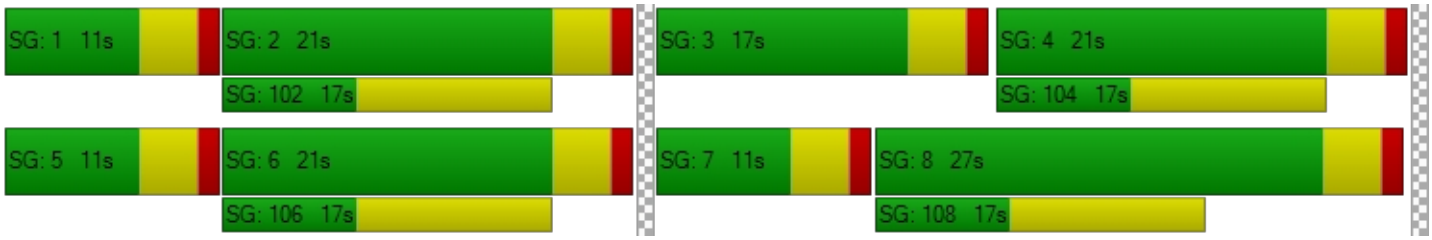
d_M, Delay for Movement [s/veh]	13.04	27.07	0.00	12.10	29.41	17.13	34.46	23.79	24.44	34.05	26.32	27.49
Movement LOS	B	C		B	C	B	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	25.01			26.51			24.66			26.80		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	25.79											
Intersection LOS	C											
Intersection V/C	0.650											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	24.86	24.86	24.86	24.86
l_p,int, Pedestrian LOS Score for Intersection	2.529	2.534	2.970	2.923
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	486	486	657	486
d_b, Bicycle Delay [s]	20.06	20.06	15.78	20.06
l_b,int, Bicycle LOS Score for Intersection	2.550	2.566	2.187	2.273
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	31.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.763

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	460	101	73	500	67	89	1451	74	135	1077	81
Base Volume Adjustment Factor	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303	1.0303
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	18	27	0	0	10	0	0	0	7	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	71	501	104	75	525	69	92	1495	83	139	1110	83
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	125	26	19	131	17	23	374	21	35	278	21
Total Analysis Volume [veh/h]	71	501	104	75	525	69	92	1495	83	139	1110	83
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	26	0	11	26	0	21	29	0	14	22	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	35	25	35	25	25	6	26	26	8	27	27
g / C, Green / Cycle	0.43	0.31	0.43	0.31	0.31	0.08	0.32	0.32	0.10	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.06	0.26	0.07	0.28	0.04	0.05	0.29	0.29	0.08	0.22	0.22
s, saturation flow rate [veh/h]	1093	1900	1112	1900	1615	1810	3618	1849	1810	3618	1833
c, Capacity [veh/h]	382	591	399	594	505	139	1158	592	176	1231	624
d1, Uniform Delay [s]	16.22	25.80	15.92	26.14	19.76	35.96	26.03	26.03	35.37	22.31	22.31
k, delay calibration	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.28	0.11	0.11	0.15
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.08	14.01	0.23	17.26	0.56	5.27	2.89	12.37	7.72	0.57	1.50
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.19	0.85	0.19	0.88	0.14	0.66	0.90	0.90	0.79	0.64	0.64
d, Delay for Lane Group [s/veh]	17.30	39.81	16.15	43.40	20.32	41.24	28.91	38.40	43.09	22.88	23.81
Lane Group LOS	B	D	B	D	C	D	C	D	D	C	C
Critical Lane Group	Yes	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.83	10.77	0.79	11.85	0.97	1.91	9.42	11.20	2.97	6.06	6.30
50th-Percentile Queue Length [ft/ln]	20.86	269.23	19.69	296.34	24.34	47.87	235.53	279.95	74.18	151.39	157.52
95th-Percentile Queue Length [veh/ln]	1.50	16.15	1.42	17.50	1.75	3.45	14.46	16.69	5.34	10.09	10.42
95th-Percentile Queue Length [ft/ln]	37.54	403.78	35.44	437.50	43.81	86.16	361.38	417.16	133.53	252.28	260.44

Movement, Approach, & Intersection Results

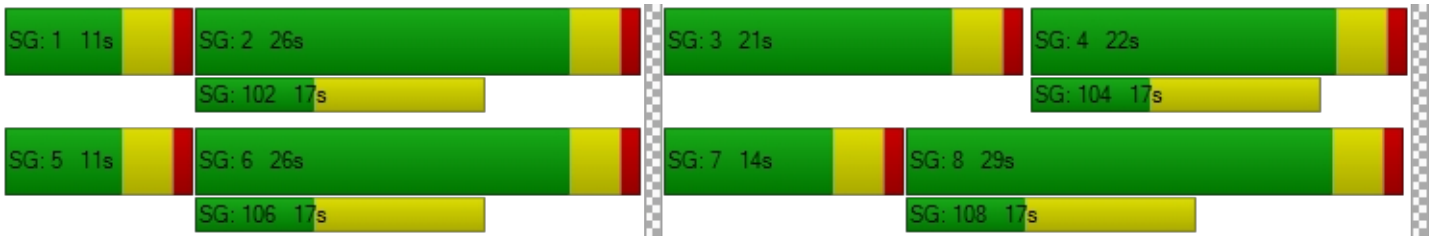
d_M, Delay for Movement [s/veh]	17.30	39.81	0.00	16.15	43.40	20.32	41.24	31.78	38.40	43.09	23.15	23.81
Movement LOS	B	D		B	D	C	D	C	D	D	C	C
d_A, Approach Delay [s/veh]	37.02			37.97			32.63			25.27		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	31.75											
Intersection LOS	C											
Intersection V/C	0.763											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	2.550	2.555	3.028	3.027
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	550	550	625	450
d_b, Bicycle Delay [s]	21.03	21.03	18.91	24.03
l_b,int, Bicycle LOS Score for Intersection	2.503	2.663	2.478	2.292
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	26.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.678

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	82	492	92	40	439	83	84	931	72	69	1128	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	12	0	8	36	2	4	30	21	0	16	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	529	97	50	497	89	92	1008	97	73	1202	78
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	132	24	13	124	22	23	252	24	18	301	20
Total Analysis Volume [veh/h]	91	529	97	50	497	89	92	1008	97	73	1202	78
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	21	0	11	21	0	17	27	0	11	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	70	70	70	70	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	32	24	32	23	23	6	20	20	5	20	20
g / C, Green / Cycle	0.46	0.34	0.46	0.32	0.32	0.08	0.29	0.29	0.08	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.08	0.28	0.05	0.26	0.06	0.05	0.20	0.20	0.04	0.23	0.23
s, saturation flow rate [veh/h]	1133	1900	1073	1900	1615	1810	3618	1816	1810	3618	1841
c, Capacity [veh/h]	462	650	428	611	520	154	1042	523	141	1016	517
d1, Uniform Delay [s]	12.84	21.07	12.76	21.89	17.10	30.99	22.34	22.35	31.14	23.73	23.74
k, delay calibration	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.12
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.95	10.72	0.12	11.29	0.71	3.69	0.89	1.77	2.94	1.89	4.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.20	0.81	0.12	0.81	0.17	0.60	0.71	0.71	0.52	0.83	0.84
d, Delay for Lane Group [s/veh]	13.79	31.79	12.88	33.17	17.82	34.67	23.23	24.12	34.08	25.62	27.74
Lane Group LOS	B	C	B	C	B	C	C	C	C	C	C
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.85	9.21	0.40	8.86	1.07	1.61	5.19	5.35	1.26	6.42	6.84
50th-Percentile Queue Length [ft/ln]	21.19	230.14	10.09	221.52	26.87	40.18	129.78	133.70	31.59	160.59	171.10
95th-Percentile Queue Length [veh/ln]	1.53	14.18	0.73	13.74	1.93	2.89	8.93	9.14	2.27	10.58	11.13
95th-Percentile Queue Length [ft/ln]	38.15	354.54	18.16	343.57	48.37	72.32	223.19	228.52	56.86	264.50	278.36

Movement, Approach, & Intersection Results

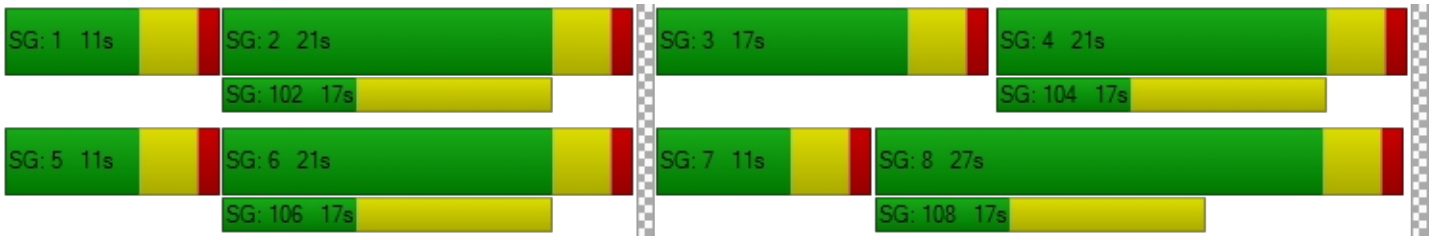
d_M, Delay for Movement [s/veh]	13.79	31.79	0.00	12.88	33.17	17.82	34.67	23.47	24.12	34.08	26.25	27.74
Movement LOS	B	C		B	C	B	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	29.15			29.43			24.39			26.75		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	26.85											
Intersection LOS	C											
Intersection V/C	0.678											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	24.86	24.86	24.86	24.86
l_p,int, Pedestrian LOS Score for Intersection	2.537	2.546	2.985	2.942
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	486	486	657	486
d_b, Bicycle Delay [s]	20.06	20.06	15.78	20.06
l_b,int, Bicycle LOS Score for Intersection	2.583	2.609	2.218	2.304
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Orange Ave (NS) at Willow St (EW)

Control Type:	Signalized	Delay (sec / veh):	33.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.776

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	175.00	100.00	100.00	125.00	100.00	100.00	235.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	51	460	101	73	500	67	89	1451	74	135	1077	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	19	34	0	16	17	5	3	22	8	0	29	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	73	517	106	93	543	75	97	1547	86	142	1161	93
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	129	27	23	136	19	24	387	22	36	290	23
Total Analysis Volume [veh/h]	73	517	106	93	543	75	97	1547	86	142	1161	93
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	10.00

Phasing & Timing

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	16	22	0	16	22	0	26	39	0	13	26	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	39	28	39	29	29	6	31	31	9	33	33
g / C, Green / Cycle	0.43	0.31	0.43	0.32	0.32	0.07	0.34	0.34	0.10	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.07	0.27	0.08	0.29	0.05	0.05	0.30	0.30	0.08	0.23	0.23
s, saturation flow rate [veh/h]	1070	1900	1097	1900	1615	1810	3618	1849	1810	3618	1829
c, Capacity [veh/h]	340	593	360	602	512	130	1236	632	177	1328	671
d1, Uniform Delay [s]	19.01	29.31	18.84	29.45	22.06	41.02	27.87	27.88	39.85	23.47	23.47
k, delay calibration	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.29	0.11	0.11	0.13
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.45	16.11	0.38	19.12	0.60	8.09	2.11	9.73	8.27	0.49	1.16
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.21	0.87	0.26	0.90	0.15	0.74	0.87	0.88	0.80	0.63	0.63
d, Delay for Lane Group [s/veh]	20.46	45.42	19.21	48.57	22.66	49.11	29.98	37.62	48.11	23.96	24.63
Lane Group LOS	C	D	B	D	C	D	C	D	D	C	C
Critical Lane Group	Yes	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.01	12.82	1.16	13.99	1.20	2.38	10.82	12.42	3.44	7.09	7.30
50th-Percentile Queue Length [ft/ln]	25.15	320.56	28.96	349.72	30.05	59.47	270.58	310.42	86.08	177.37	182.45
95th-Percentile Queue Length [veh/ln]	1.81	18.70	2.09	20.12	2.16	4.28	16.22	18.20	6.20	11.46	11.73
95th-Percentile Queue Length [ft/ln]	45.27	467.38	52.13	503.07	54.09	107.05	405.47	454.89	154.94	286.57	293.21

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	20.46	45.42	0.00	19.21	48.57	22.66	49.11	32.29	37.62	48.11	24.15	24.63
Movement LOS	C	D		B	D	C	D	C	D	D	C	C
d_A, Approach Delay [s/veh]	42.33			41.99			33.50			26.62		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	33.87											
Intersection LOS	C											
Intersection V/C	0.776											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.565	2.576	3.052	3.061
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	400	400	778	489
d_b, Bicycle Delay [s]	28.80	28.80	16.81	25.69
l_b,int, Bicycle LOS Score for Intersection	2.533	2.733	2.511	2.327
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

