APPENDIX D
Transportation Impact Analysis

KITTELSON & ASSOCIATES

Transportation Impact Analysis

2300 REDONDO AVENUE

Long Beach, CA

December 2017

Final Report

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Project No. 21730

December 2017

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1.0 INTRODUCTION

This report presents the findings of the transportation impact analysis conducted for the 2300 Redondo Avenue Project (herein referred to as the "proposed Project") in the City of Long Beach, California.

This study assessed the potential impacts resulting from the addition of the traffic generated by the proposed Project on the surrounding transportation system and to identify feasible measures to mitigate any significant impacts. In addition, this study included a review of the site plan for the proposed Project to verify adequacy of internal circulation and external access. Turning templates for the anticipated truck movements were also analyzed to ensure that the driveways and circulation aisles provide enough space for large trucks.

The proposed Project location and vicinity are shown in Figure 1.

1.1 PROJECT DESCRIPTION AND LOCATION

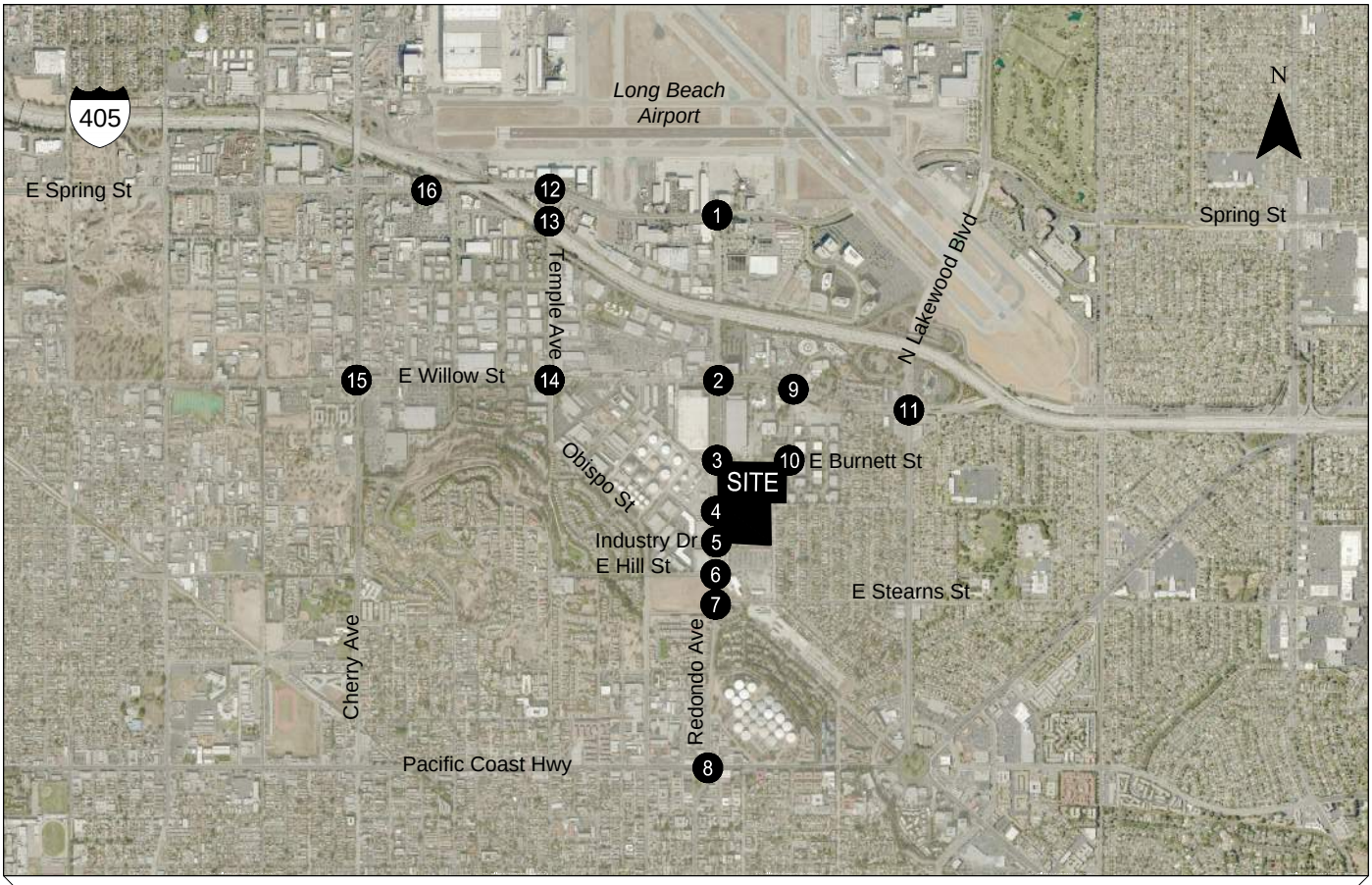
The proposed Project site is located at 2300 Redondo Avenue in the City of Long Beach, California (City), at the southeast corner of the intersection of Redondo Avenue/Burnett Street. Interstate 405 (1-405) is located approximately ½ mile north of the proposed Project site and State Route 1 – Pacific Coast Highway (PCH) is located approximately ¾ mile south of the proposed Project site. The proposed Project site is currently occupied by an United States Postal Service (USPS) facility which includes a 323,933 square-foot mail processing building and an 11,456 square-foot vehicle maintenance facility. The USPS intends to close and vacate the facility in April 2018 and the majority of mail processing activities at the facility have already ceased. As such, it was assumed that the proposed Project would not receive credit for the displacement of the existing uses.

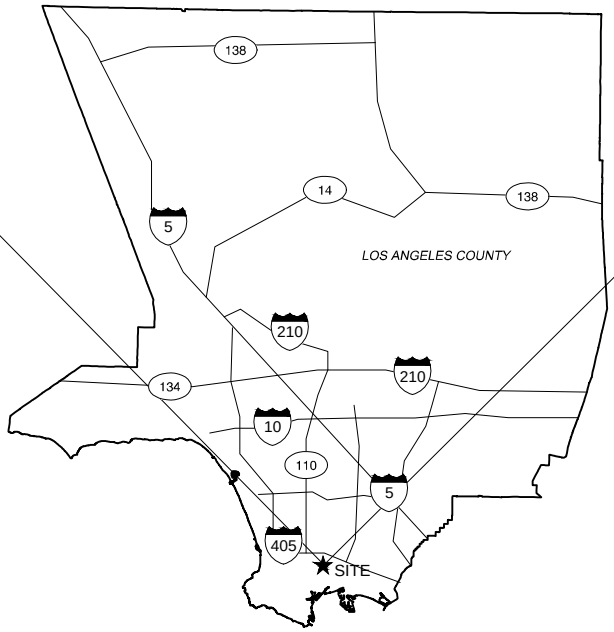
The site plan for the proposed Project is presented in Figure 2. The proposed Project includes the demolition of the existing USPS mail processing and vehicle maintenance facilities and construction of three new buildings (referred to as Buildings 1, 2 and 3). The new development would consist of 427,565 square feet (sf) of manufacturing space, with office and warehousing space to support the manufacturing tenants. In addition, the proposed Project would provide 638 surface parking spaces. Gates are located at the truck loading areas for each building delineating these loading areas from the rest of the parking areas. For the purposes of this analysis, it was assumed that these gates would remain open during the day when loading activities are occurring and would only close overnight. As such, operations of the gates would not affect the distribution and assignment of the trips to and from the proposed Project site.

Site access would be provided via two driveways on Redondo Avenue and four driveways on Burnett Street (referred to as Driveways 1 to 6). On Redondo Avenue, Driveway 1 would be aligned with Industry Drive and Driveway 2 would be located midblock between Burnett Street and Industry Drive. Driveway 1 would provide primary truck access to the Building 1 loading area and Driveway 2 would provide access to the entire site. On Burnett Street, Driveways 3 and 4 would provide access to Building 2; Driveway 4 would provide primary truck access to the Building 2 loading area. Driveways 5 and 6

would provide access to Building 3; Driveway 6 would provide primary truck access to the Building 3 loading area. The surface parking spaces and circulating aisles surround all three buildings.

The site plan for the proposed Project is presented in Figure 2.





Figure

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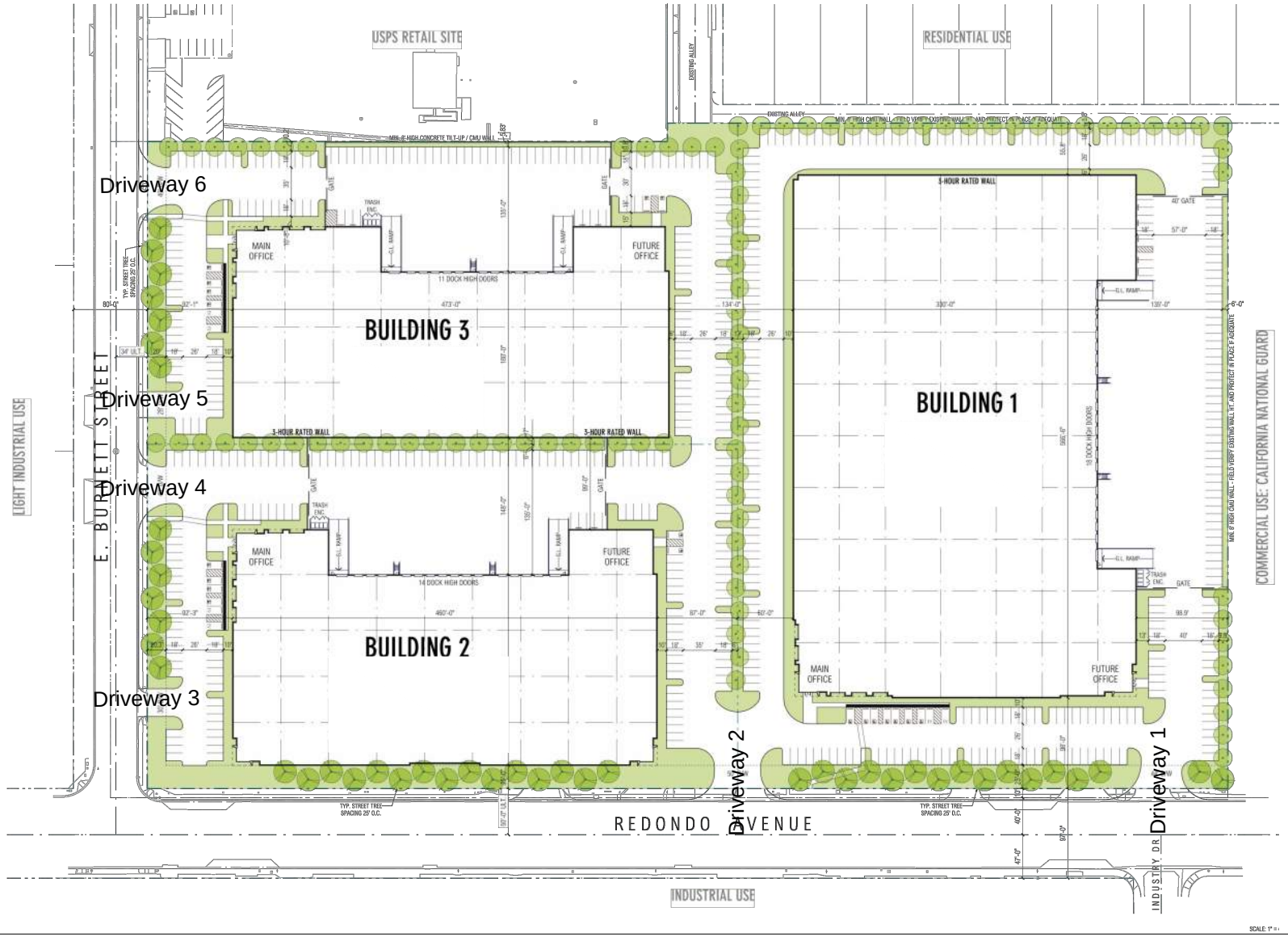

USPS RETAIL SITE
RESIDENTIAL USE
EXISTING ALLEY
LIGHT INDUSTRIAL USE
E. BURNETT STREET
COMMERCIAL USE: CALIFORNIA NATIONAL GUARD
INDUSTRIAL USE
REDONDO AVENUE
INDUSTRY DR
Driveway 1
Driveway 2
Driveway 3
Driveway 4
Driveway 5
Driveway 6
BUILDING 1
BUILDING 2
BUILDING 3
MAIN OFFICE
FUTURE OFFICE
3-HOUR RATED WALL
11 DOCK HIGH DOORS
14 DOCK HIGH DOORS
18 DOCK HIGH DOORS
TRASH ENC.
GATE
40' GATE
TYP. STREET TREE SPACING 25' O.C.

Figure ?

1.2 STUDY SCOPE AND METHODOLOGY

The scope and analysis methodologies utilized for this study were developed in consultation with staff from the City of Long Beach Public Works Department, and are presented in this section.

Analysis Scenarios

A vehicle level of service (LOS) analysis was performed to assess the performance of the transportation system during the weekday AM (7:00 – 9:00 AM) and PM (4:00 – 6:00 PM) peak periods for the following four scenarios:

- Existing Conditions;
- Existing Plus Proposed Project Conditions;
- Cumulative (Year 2019) Conditions; and,
- Cumulative (Year 2019) Plus Proposed Project Conditions.

Study Intersections

Based on the expected distribution of the trips generated by the proposed Project and subsequent conversations with City staff, the following study intersections were selected for analysis:

1. Redondo Avenue/Spring Street (signalized)
2. Redondo Avenue/Willow Street (signalized)
3. Redondo Avenue/Burnett Street (signalized)
4. Redondo Avenue/Project Driveway (unsignalized)
5. Redondo Avenue/Industry Drive/Project Driveway (unsignalized)
6. Redondo Avenue/Hill Street (signalized)
7. Redondo Avenue/Stearns Street (signalized)
8. Redondo Avenue/PCH (signalized)
9. Grand Avenue/Willow Street (signalized)
10. Grand Avenue/Burnett Street (unsignalized)
11. Lakewood Boulevard/Willow Street (signalized)
12. Temple Avenue/Spring Street (signalized)
13. Temple Avenue/I-405 Northbound Off-ramps (signalized)
14. Temple Avenue/Willow Street (signalized)
15. Cherry Avenue/Willow Street (signalized)
16. I-405 Southbound Off-ramps/Spring Street (signalized)

The study area for the analysis extends from Cherry Avenue to the west, Spring Street to the north, Lakewood Boulevard to the east, and PCH to the south. The locations of the study intersections are shown on the map in Figure 1.

Intersection Analysis Methodology

Per City guidelines[1], the operating conditions at the signalized study intersections under the jurisdiction of the City were evaluated using the Intersection Capacity Utilization (ICU) methodology and the operating conditions at the unsignalized study intersections under the jurisdiction of the City were evaluated using the 2010 Highway Capacity Manual (2010 HCM)[2] methodology. Per the California Department of Transportation (Caltrans) guidelines[3], the operating conditions at the study intersections under the jurisdiction of Caltrans (intersections 8, 13, and 16) were evaluated using the 2010 HCM methodology. The ICU methodology is based on the sum of the volume to capacity (V/C) ratios for the conflicting movements at the intersection. The 2010 HCM methodology for signalized and all-way stop controlled intersections is based on the weighted average control delay (seconds per vehicle) for all intersection legs at the intersection and the 2010 HCM methodology for two-way stop controlled intersections is based on the weighted average control delay of the worst approach at the intersection.

All intersections were analyzed using the Vistro analysis software.

Level of Service

"Level of service" (LOS) describes the operating conditions experienced by users of a facility. LOS is a qualitative measure of the effect of a number of factors, including speed and travel time, traffic interruptions, freedom to maneuver, driving comfort and convenience. LOS is designated A through F from best to worst, and cover the entire range of traffic operations that might occur. LOS A through LOS E generally represent traffic volumes at less than roadway capacity, while LOS F represents over capacity and/or forced flow conditions. The LOS for the ICU methodology is based on the V/C ratio and the LOS for the 2010 HCM methodology is based on the average control delay at the intersection.

Table 1 presents the range of the V/C ratios (from City standards) and the range of the average control delays (from 2010 HCM) associated with each LOS grade designation for signalized intersections. Table 2 presents the range of the average control delays (from 2010 HCM) associated with each LOS grade designation for unsignalized intersections.

[1] City of Long Beach, Traffic Impact Analysis (TIA) Guidelines, City of Long Beach.

[2] 2010 Highway Capacity Manual, Transportation Research Board, 2010.

[3] Guide for the Preparation of Traffic Impact Studies, State of California, Department of Transportation, December 2002.

Table 1: Signalized Intersection Level of Service Definitions

LOS	Description of Traffic Conditions	Intersection Capacity Utilization Methodology (Volume/Capacity Ratio)	2010 HCM Methodology (Average Delay in Seconds)
A	Excellent. No vehicle waits longer than one red light, and no approach phase is fully used.	≤0.600	≤10.0
B	Very good. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.	0.601 - 0.700	>10.0 and ≤20.0
C	Good. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.	0.701 – 0.800	>20.0 and ≤35.0
D	Fair. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit cleaning of developing lines, preventing excessive backups	0.801 – 0.900	>35.0 and ≤55.0
E	Poor. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.	0.901 – 1.000	>55.0 and ≤80.0
F	Failure. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Potentially very long delays with continuously increasing queue lengths.	> 1.000	>80.0

Source: City of Long Beach Traffic Impact Analysis (TIA) Guidelines, City of Long Beach; and 2010 Highway Capacity Manual, Transportation Research Board, Washington, D.C., 2010

Table 2: Unsignalized Intersection Level of Service Definitions

LOS	Description of Traffic Conditions	Average Delay Per Vehicle (Seconds)
A	Free flowing. Most vehicles do not have to stop.	≤10.0
B	Minimal delays. Some vehicles have to stop, although waits are not bothersome.	>10.0 and ≤15.0
C	Acceptable delays. Significant numbers of vehicles have to stop because of steady, high traffic volumes. Still, many pass without stopping.	>15.0 and ≤25.0
D	Tolerable delays. Many vehicles have to stop. Drivers are aware of heavier traffic. Cars may have to wait through more than one red light. Queues begin to form, often on more than one approach.	>25.0 and ≤35.0
E	Significant delays. Cars may have to wait through more than one red light. Long queues form, sometimes on several approaches.	>35.0 and ≤50.0
F	Excessive delays. Intersection is jammed. Many cars have to wait through more than one red light, or more than 60 seconds. Traffic may back up into “up-stream” intersections.	>50.0

Source: 2010 Highway Capacity Manual, Transportation Research Board, Washington, D.C., 2010

Significance Criteria

According to the City guidelines, an intersection operating at a LOS D or better is considered to be operating satisfactory. At signalized locations, a significant impact occurs if the operating conditions worsen from LOS D or better to LOS E or F after the addition of the traffic generated by a project. If the intersection is operating at LOS E or F in the without-project conditions, a significant impact occurs if the V/C ratio increases by 0.02 or more after the addition of the traffic generated by a project. At unsignalized locations, a significant impact occurs if the operating conditions worsen from LOS D or better to LOS E or F after the addition of the traffic generated by the project, and the traffic signal warrant analysis determines that a traffic signal is warranted. For the purposes of this analysis, the Eight Hour, Four Hour, and Peak Hour signal warrants were prepared.

According to the Caltrans guidelines, it is recommended that the lead agency consult Caltrans to determine the appropriate target LOS for an intersection. For this analysis, LOS D was considered to be the target LOS (as the City accepts LOS D as a satisfactory operating condition) and will be utilized to determine whether the addition of the traffic generated by the proposed Project causes a significant impact at intersections under Caltrans' jurisdiction.

Queuing

The 95th percentile queues at the freeway ramps were reviewed to analyze whether the addition of the proposed Project traffic would cause queuing to extend back to the freeway mainline. The 95th percentile queue lengths represent the theoretical "maximum" queue that would form at the off-ramp.

Signal Warrants

A traffic signal warrant analysis was conducted at Driveways 1 and 2 on Redondo Avenue and any unsignalized study intersection where the addition of the proposed Project traffic would worsen the operating conditions from LOS D or better to LOS E or F. Traffic signal warrants are standards presented in the California Manual on Uniform Traffic Control Devices (CA MUTCD)[4] that provide guidelines in the determination of the need for a traffic signal. A traffic signal should not be installed if no warrants are met, since the installation of traffic signals may increase delays for the majority of through traffic and may increase the potential for accidents. Similarly, the satisfaction of traffic signal warrants shall not in itself require the installation of a traffic control signal. The following warrants were analysis for the purposes of this analysis:

- Warrant 1, Eight-Hour Vehicular Volume;
- Warrant 2, Four-Hour Vehicular Volume; and,
- Warrant 3, Peak Hour Vehicular Volume.

[4] California Manual on Uniform Traffic Control Devices, 2014 Edition, Caltrans, April 7, 2017.

Site Access and Circulation

A qualitative site access and circulation analysis was conducted. This included a review of the proposed Project access points and a review of truck turning movements expected to occur on the site and where the proposed Project site provided enough space to make the movements. Truck turning templates for WB-67 trucks were prepared using the AutoTURN software.

2.0 EXISTING CONDITIONS

A comprehensive data collection effort was undertaken to develop a detailed description of existing conditions in the vicinity of the proposed Project. The Existing Conditions analysis includes an assessment of the existing street system and an analysis of traffic volumes and current operating conditions.

2.1 ROADWAY NETWORK

The existing roadway network in the study area is comprised of the following street system:

Spring Street is a designated Major Avenue in the Mobility Element of the City's General Plan. It is located north of the proposed Project site and travels in the east-west direction. West of Temple Avenue and east of Redondo Avenue in the vicinity of the proposed Project site, it generally consists of four travel lanes (two in each direction). Between Temple Avenue and Redondo Avenue, it consists of six travel lanes (three in each direction).

Willow Street is a designated Boulevard in the Mobility Element of the City's General Plan. It is located north of the proposed Project site and travels in the east-west direction. West of Temple Avenue and east of Redondo Avenue in the vicinity of the proposed Project site, it generally consists of four travel lanes (two in each direction). Between Temple Avenue and Redondo Avenue, it consists of six travel lanes (three in each direction). In the proposed Project study area, it generally consists of six travel lanes (three in each direction).

Burnett Street is not designated in the Mobility Element of the City's General Plan. It is located adjacent to the north side of the proposed Project site and travels in the west-east direction. It consists of two travel lanes (one in each direction).

Industry Drive is not designated in the Mobility Element of the City's General Plan. It aligns with the southern proposed Project driveway on Redondo Avenue and serves as a connection to the industrial development across the street from the proposed Project. It consists of two travel lanes (one in each direction).

Hill Street is a designated Neighborhood Connector in the Mobility Element of the City's General Plan. It is located south of the proposed Project site and travels in the east-west direction. In the vicinity of the proposed Project site, it generally consists of two travel lanes (one in each direction).

Stearns Street is a designated Neighborhood Connector between Redondo Avenue and Clark Avenue/Los Coyotes Diagonal and a designated Minor Avenue east of Clark Avenue/Los Coyotes Diagonal in the Mobility Element of the City's General Plan. It is located south of the proposed Project site and travels in the east-west direction. Between Redondo Avenue and Clark Avenue/Los Coyotes Diagonal in the vicinity of the proposed Project site, it generally consists of two travel lanes (one in each

direction). East of Clark Avenue/Los Coyotes Diagonal, it consists of four travel lanes (two in each direction).

State Route 1 - Pacific Coast Highway (PCH) is a designated Regional Corridor in the Mobility Element of the City's General Plan. It is located south of the proposed Project site and travels in the east-west direction in the proposed Project study area (transitions to north-south direction in other areas). In the vicinity of the proposed Project site, it generally consists of six travel lanes (three in each direction).

Cherry Avenue is a designated Major Avenue in the Mobility Element of the City's General Plan. It is located west of the proposed Project site and travels in the north-south direction. North of Spring Street and south of Crescent Heights Streets, it generally consists of four travel lanes (two in each direction). Between Spring Street and Crescent Heights Streets, it consists of six travel lanes (three in each direction).

Temple Avenue is a designated Neighborhood Collector in the Mobility Element of the City's General Plan. It is located west of the proposed Project site and travels in the north-south direction. It generally consists of four travel lanes (two in each direction).

Redondo Avenue is a designated Major Avenue in the Mobility Element of the City's General Plan[5]. It is located immediately adjacent to the west side of the proposed Project site and travels in the north-south. Adjacent to the proposed Project site, south of Burnett Street, it consists of four travel lanes (two in each direction). Between Willow Street and Burnett Street, it consists of six travel lanes (three in each direction). Between Spring Street and Willow Street, it consists of five travel lanes (three in the northbound direction and two in the southbound direction).

Grand Avenue is not designated in the Mobility Element of the City's General Plan. It is located east of the proposed Project site and travels in the north-south direction. It consists of two travel lanes (one in each direction).

Lakewood Boulevard is a designated Regional Corridor in the Mobility Element of the City's General Plan. It is located east of the proposed Project site and travels in the north-south direction with a speed limit of 40 miles per hour. South of Spring Street and north of Conant Street in the vicinity of the proposed Project site, it generally consists of six travel lanes (three in each direction). Between Conant Street and Spring Street, it consists of eight travel lanes (four in each direction).

2.2 TRANSIT FACILITIES

The Long Beach Transit (LBT) provides transit service in the study area. The following routes operate in the vicinity of the proposed Project site:

[5] Mobility Element, City of Long Beach General Plan, City of Long Beach, October 2013.

LBT Route 131 extends from Seal Beach and provides connection to the Wardlow Metro Rail Blue Line station. Route 131 travels on Redondo Avenue in the vicinity of the proposed Project site. Bus stops for Route 131 are located on both sides of Redondo Avenue directly in front of the proposed Project site, at the corner of the intersection of Redondo Avenue/Burnett Street. During the weekday AM and PM commute period, Route 131 provides headways of approximately 45 minutes in the northbound and southbound direction.

LBT Route 111 extends from the Downtown Long Beach Metro Rail Blue Line Station to the Lakewood Regional Medical Center. Route 111 travels on Willow Street east of Redondo Avenue before turning on Redondo Avenue north of Willow Street in the vicinity of the proposed Project site. During the weekday AM and PM commute period, Route 111 provides headways of approximately 20 minutes in the northbound and southbound direction.

LBT Route 102/104 extends from the intersection of Santa Fe Avenue/25th Street to the Long Beach Civic Center. Route 102/104 travels on Willow Street in the vicinity of the proposed Project site. During the weekday AM commute period, Route 102/104 provides headways of approximately 30 minutes in the northbound and southbound direction. During the weekday PM commute period, Route 102/104 provides headways of approximately 40 minutes in the northbound and southbound direction.

2.3 BICYCLE AND PEDESTRIAN FACILITIES

Per the Mobility Plan of the City's General Plan, a Class III Bicycle Route/Sharrow facility is provided on PCH west of Lakewood Boulevard. No other bicycle facilities are provided in the immediate vicinity of the proposed Project site.

All of the roadways in the study area consist of sidewalks on both sides of the street, and all signalized intersections provide marked pedestrian crosswalks with pedestrian signals.

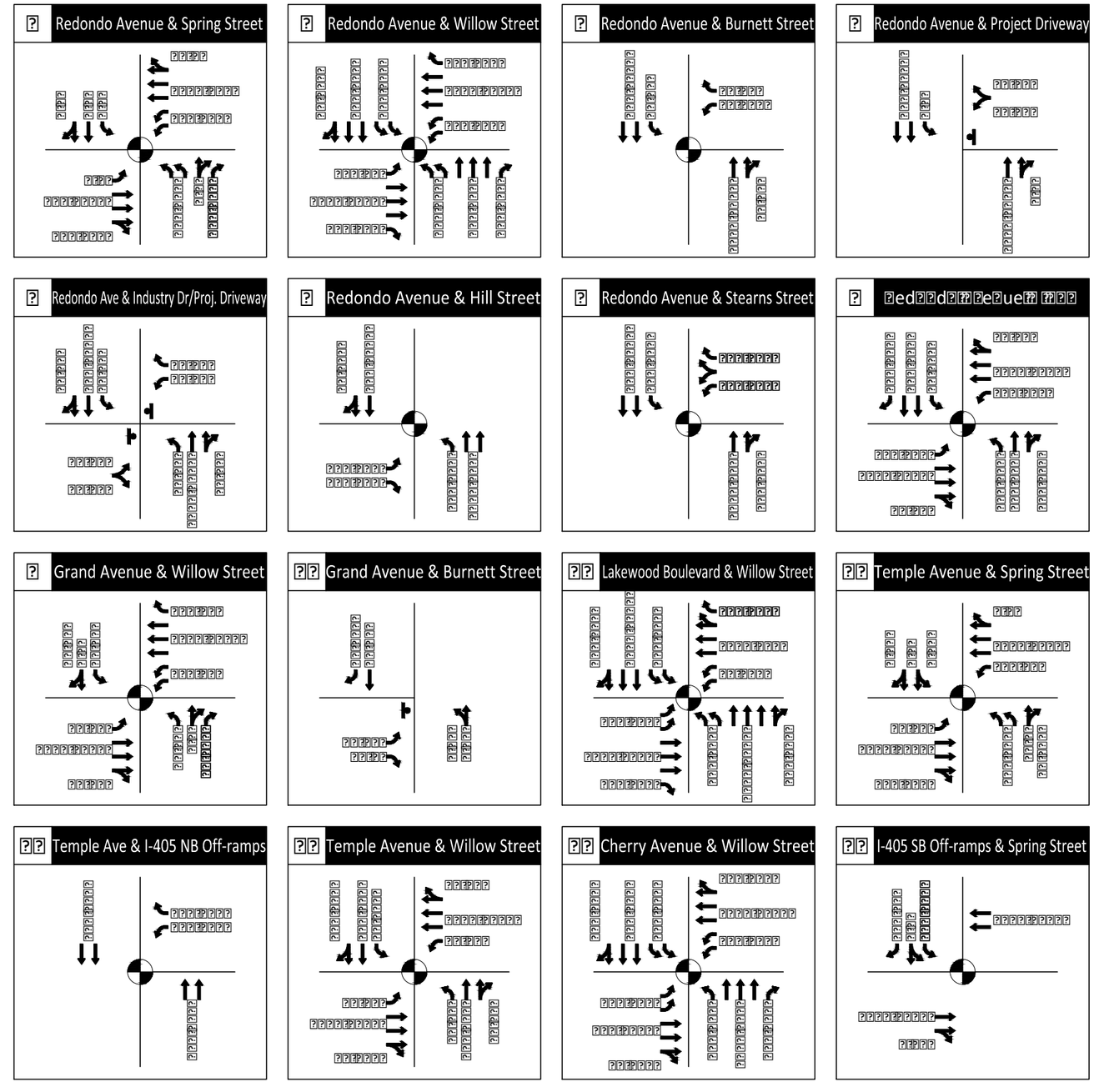
2.4 EXISTING TRAFFIC VOLUMES AND LEVELS OF SERVICE

This section presents the existing peak hour turning movement traffic volumes and the resulting operating conditions at each study intersection.

Existing Traffic Volumes

The existing operations of the study intersections were assessed for the weekday AM and PM peak hours. Existing traffic volume data was collected on Wednesday, September 23, 2017, which represents a typical weekday with local schools and colleges in session. Data was collected between 7:00 AM and 9:00 AM and between 4:00 PM and 6:00 PM. The peak hour volumes utilized in this analysis, shown in Figure 3, represent the highest hour during the weekday AM and PM data collection periods.

Appendix A provides the count sheets for each intersection.



- Traffic Volume
- Stop Sign
- Traffic Signal

Figure

Existing Intersection Levels of Service

Intersection turning movement volumes, lane configurations, and traffic control were used to calculate the levels of service at the study intersections for the weekday AM and PM peak hours. Table 3 shows the LOS results based on the V/C ratios or delay for the study intersections under Existing Conditions. As shown, all intersections currently operate at or better than the LOS D standard set forth by the City except for the following locations, which operate at LOS E or F during the weekday AM or PM peak hour:

- #5 – Redondo Avenue/Industry Drive (LOS E during the PM peak hour);
- #8 – Redondo Avenue/PCH (LOS E during the AM peak hour);
- #11 – Lakewood Boulevard/Willow Street (LOS F during the AM peak hour and LOS E during the PM peak hour); and,
- #15 – Cherry Avenue/Willow Street (LOS E during the PM peak hour).

Detailed LOS worksheets for Existing Conditions are presented in Appendix B.

Table 3: Intersection Level of Service - Existing Conditions

#	Intersection	Control	Peak Hour	Existing		
				V/C	Delay (s/veh)	LOS
1	Redondo Avenue/ Spring Street	Signalized	AM	0.749		C
			PM	0.836		D
2	Redondo Avenue/ Willow Street	Signalized	AM	0.806		D
			PM	0.867		D
3	Redondo Avenue/ Burnett Street	Signalized	AM	0.689		B
			PM	0.601		B
4	Redondo Avenue/ Project Driveway	TWSC	AM		27.9	D
			PM		17.5	C
5	Redondo Avenue/ Industry Drive-Project Driveway	TWSC	AM		32.2	D
			PM		**47.2**	**E**
6	Redondo Avenue/ Hill Street	Signalized	AM	0.734		C
			PM	0.784		C
7	Redondo Avenue/ Stearns Street	Signalized	AM	0.758		C
			PM	0.721		C
8	Redondo Avenue/ PCH	Signalized	**AM**		**56.3**	**E**
			PM		48.0	D
9	Grand Avenue/ Willow Street	Signalized	AM	0.648		B
			PM	0.757		C
10	Grand Avenue/ Burnett Street	TWSC	AM		9.0	A
			PM		9.4	A
11	Lakewood Boulevard/ Willow Street	Signalized	**AM**	**1.093**		**F**
			PM	**0.999**		**E**
12	Temple Avenue/ Spring Street	Signalized	AM	0.685		B
			PM	0.719		C
13	Temple Avenue/ I-405 Northbound Off-ramps	Signalized	AM		8.9	A
			PM		10.8	B

#	Intersection	Control	Peak Hour	Existing		
				V/C	Delay (s/veh)	LOS
14	Temple Avenue/ Willow Street	Signalized	AM	0.663		B
			PM	0.787		C
15	Cherry Avenue/ Willow Street	Signalized	AM	0.862		D
			PM	**0.932**		**E**
16	I-405 Southbound Off-ramps/ Spring Street	Signalized	AM		19.8	B
			PM		10.0	A

Notes:
LOS – Level of Service
Signalized – Signal Controlled Intersection (LOS based on V/C ratios)
TWSC – Two-Way Stop Controlled (LOS based on highest delay approach)
BOLD – Intersection operating at LOS E or F
Source: Kittelson & Associates, Inc., 2017

Existing Queuing at Freeway Ramps

The 95th percentile queues at the freeway ramps were reviewed to analyze whether queuing extends back to the freeway mainline. The 95th percentile queuing at the freeway ramps (Intersections 13 and 16) for Existing Conditions is presented in Table 4. As shown, queuing does not back up to the freeway mainline segments at either of the two freeway ramps under the Existing Conditions.

Table 4: 95th Percentile Queuing at Freeway Ramps – Existing Conditions

#	Intersection	Peak Hour	Ramp Storage Space (ft)	Queuing (ft)	
				Ramp Left-turn Lane	Ramp Right-turn Lane
13	Temple Avenue/ I-405 Northbound Off-ramps	AM	740	80	40
		PM		140	40
16	I-405 Southbound Off-ramps/ Spring Street	AM	860	250	210
		PM		100	50

Source: Kittelson & Associates, Inc., 2017.

3.0 PROPOSED PROJECT TRAVEL DEMAND

This chapter describes the assumptions and methodology used in developing the traffic volumes associated with the proposed Project within the Study Area.

3.1 PROPOSED PROJECT DESCRIPTION

The proposed Project includes the demolition of the existing USPS facility (323,933 square-foot mail processing building and an 11,456 square-foot vehicle maintenance facility). The new development would consist of 427,565 square feet (sf) of manufacturing space with office and warehousing space to support the manufacturing tenants.

3.2 PROPOSED PROJECT TRIP GENERATION

The number of trips expected to be generated by the proposed Project were estimated using rates published in the Institute of Transportation Engineer's (ITE) Trip Generation Manual[6]. These rates are provided as both daily rates and AM and PM peak hour rates. Overall, the rates relate the number of vehicle trips traveling to and from the Project Site to the size of development of each land use.

Based on discussions with the City staff, the Manufacturing land-use rates (ITE Code 140) were applied to determine the number of trips generated by the proposed Project. To account for the trucks expected to be generated by the proposed Project, it was estimated that 20% of the trips would be truck trips, based on recent studies in the area and truck rates presented in the ITE Trip Generation Manual. A passenger car equivalent (PCE) factor of 2.0 was applied to the expected number of truck trips to convert them into automobile trips.

As shown in Table 5, the proposed Project is expected to generate 1,966 trips on a weekday daily basis, including 374 trips in the AM peak hour (330 inbound and 44 outbound) and 382 trips in the PM peak hour (46 inbound and 336 outbound).

Appendix C includes the detailed Project trip generation rates and calculations.

[6] Institute of Transportation Engineer's (ITE) Trip Generation Manual (Ninth Edition, 2012)

Table 5: Project Trip Generation

Land Use	GLA	Units	Daily	AM			PM		
				In	Out	Total	In	Out	Total
Manufacturing (ITE Code 140)	427,565	sf	1,638	275	37	312	38	280	318
(1) Estimated Number of Passenger Vehicles (80% of total trips)			1,310	220	30	250	30	224	254
Estimated Number of Trucks (20% of total trips)			328	55	7	62	8	56	64
(2) Trucks Adjusted to Passenger Vehicles (assumed PCE 2.0)			656	110	14	124	16	112	128
(1)+(2) TOTAL			**1,966**	**330**	**44**	**374**	**46**	**336**	**382**

Notes:
ITE Rates Used:
Daily – Trips calculated by formula T = 3.88(X) – 20.70
AM – 0.73 trips per 1,000 sf
PM – Trips calculated by formula T = 0.78(X) – 15.97
GLA – Gross Leasable Area
sf – Square feet
Source: Kittelson & Associates, Inc., 2017

3.3 PROJECT TRIP DISTRIBUTION

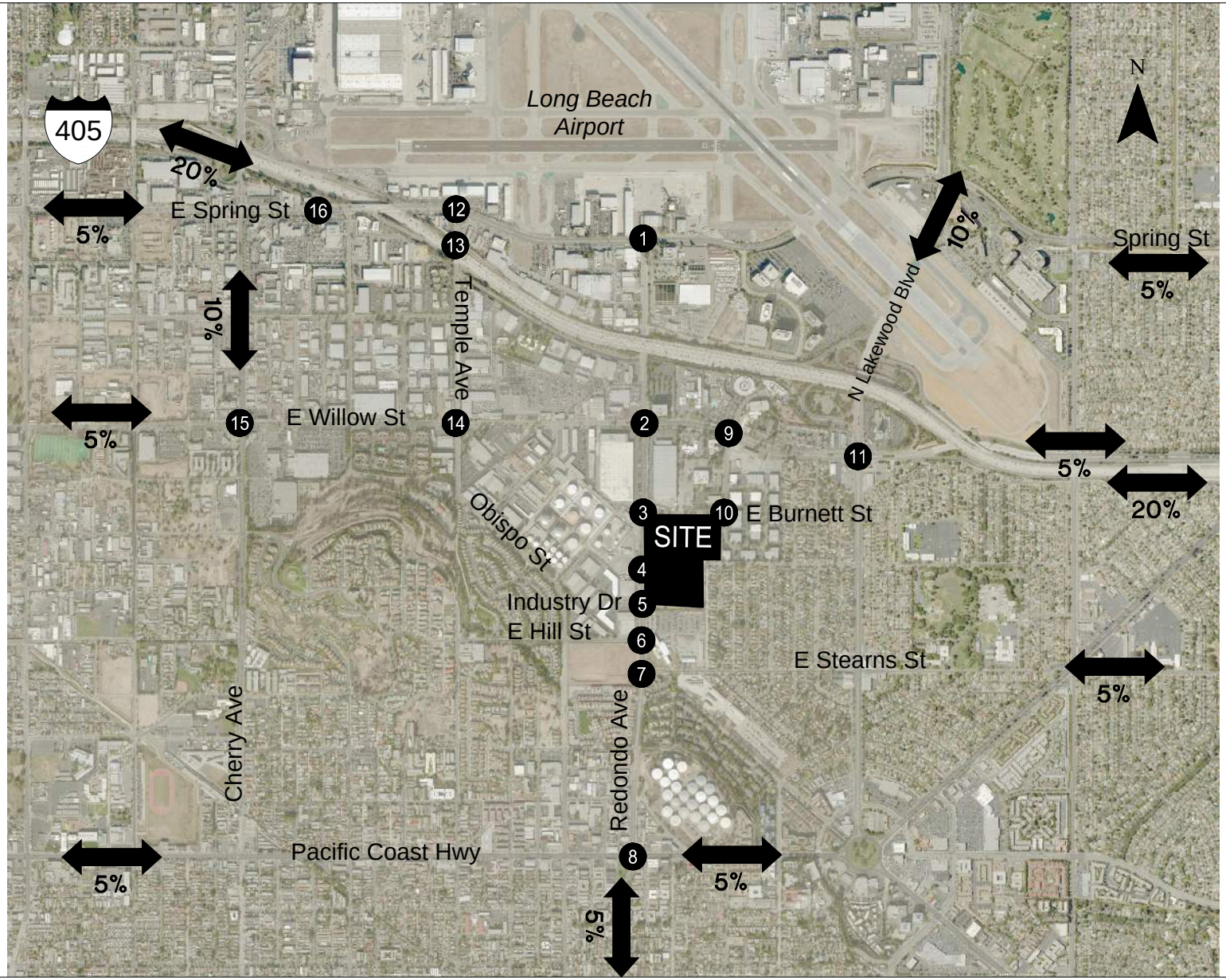
The geographic distribution of trips generated by the proposed Project is dependent on characteristics of the street system serving the proposed Project Site and the level of accessibility of the routes to and from the proposed Project Site. Due to their travel characteristics, different distribution patterns were prepared for passenger vehicles and trucks accessing the proposed Project site. In addition, the truck trip distribution was prepared in accordance with the designated City of Long Beach and City of Signal Hill truck routes.

In particular, access to Building 1 would be provided via the two driveways on Redondo Avenue (Driveways 1 and 2) and access to Buildings 2 and 3 would be provided via the driveways on Burnett Street (Driveways 3 to 6) as well as the Driveway 2 on Redondo Avenue.

The proposed Project trip distribution for passenger vehicles is presented in Figure 4 and the proposed Project distribution for trucks is provided in Figure 5.

3.4 PROJECT TRIP ASSIGNMENT

The trip distribution patterns shown in Figure 4 and Figure 5 were applied to the proposed Project trip generation estimates summarized in Table 5 to calculate Project-generated traffic through the study intersections. Figure 6 illustrates the Project-only traffic volumes at the study intersections during the weekday AM and PM peak hours.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SITE
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Industry Dr
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Figure

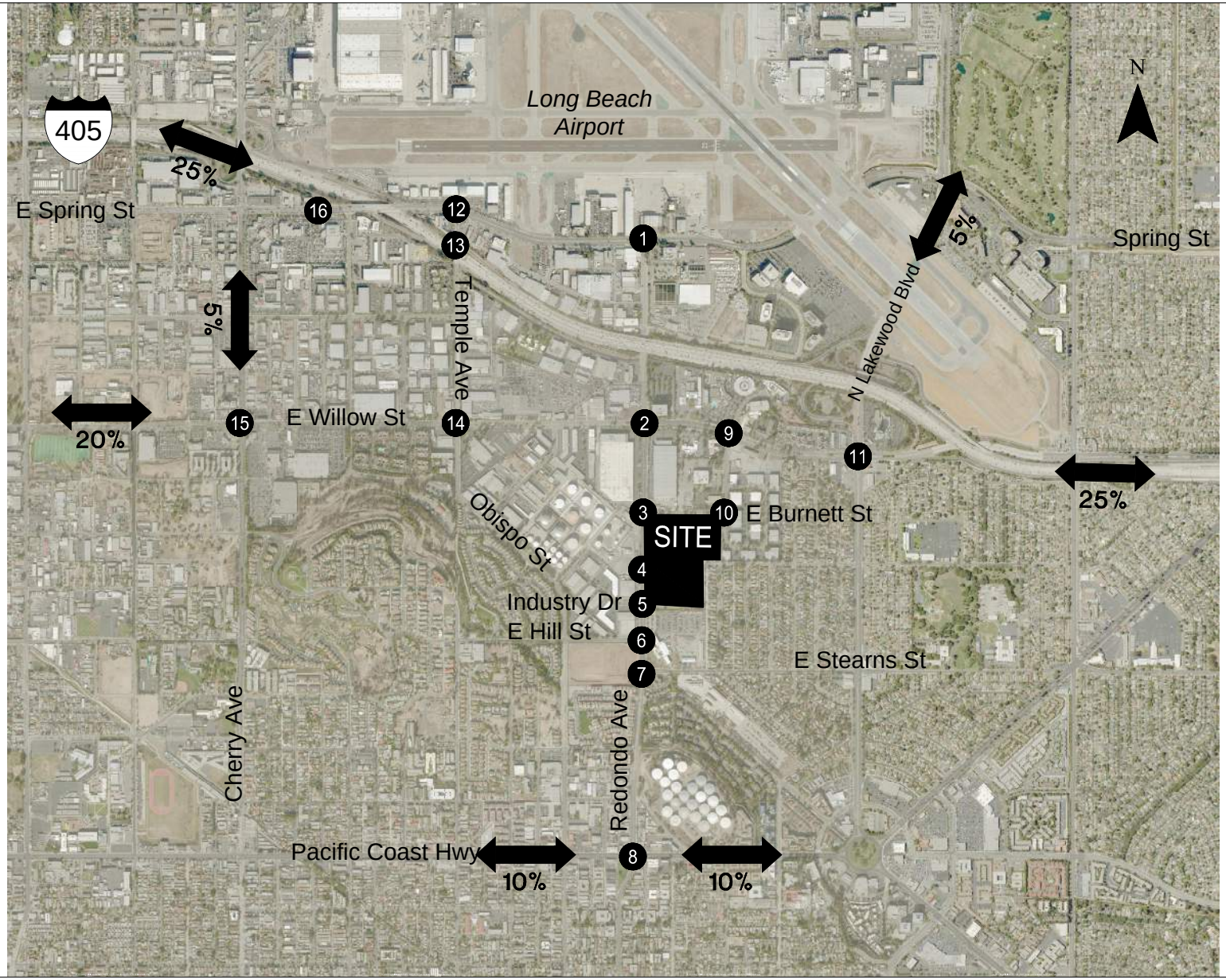
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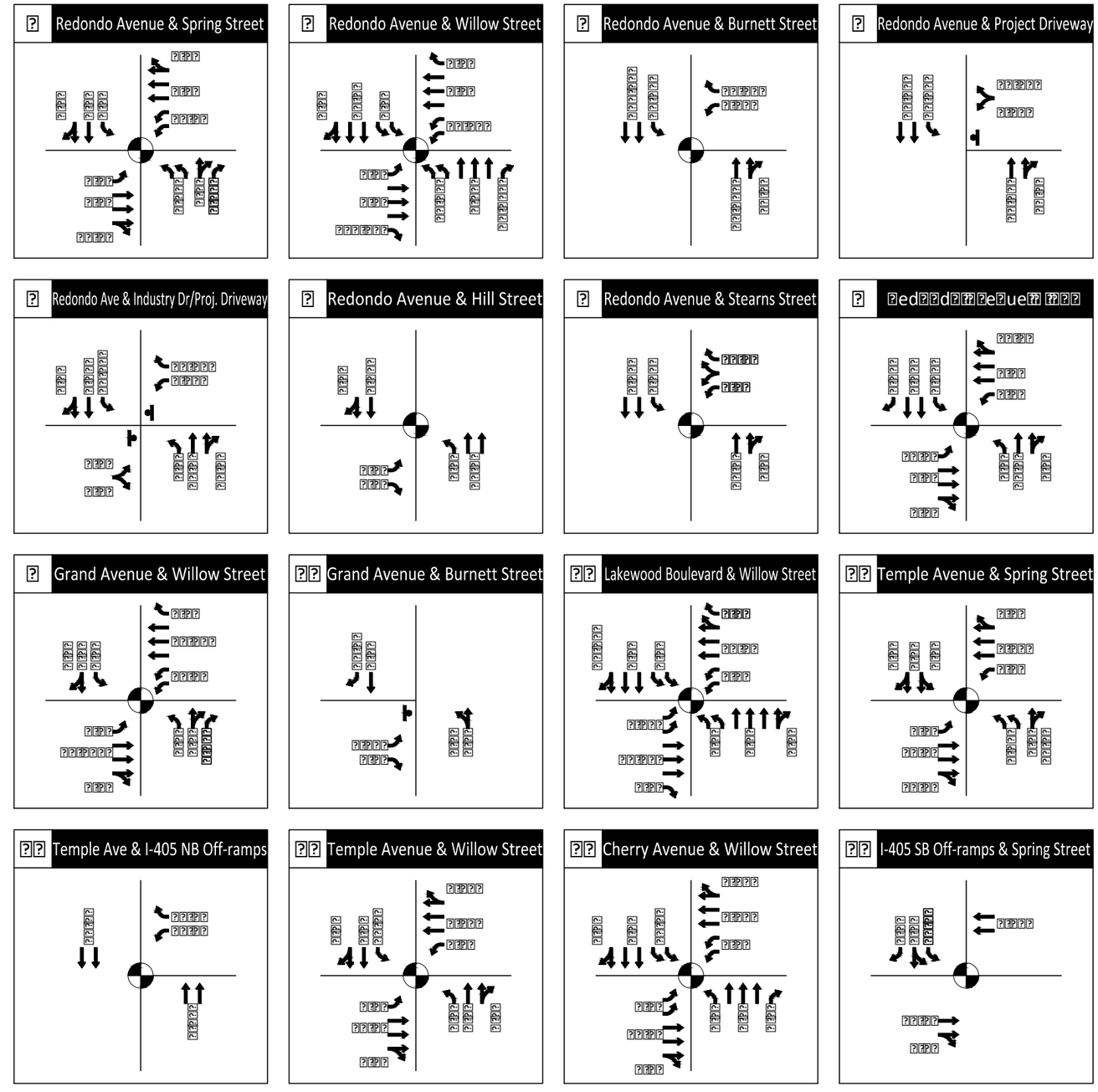
Figure



- M - Traffic Volume
- Stop Sign
- Traffic Signal

Figure

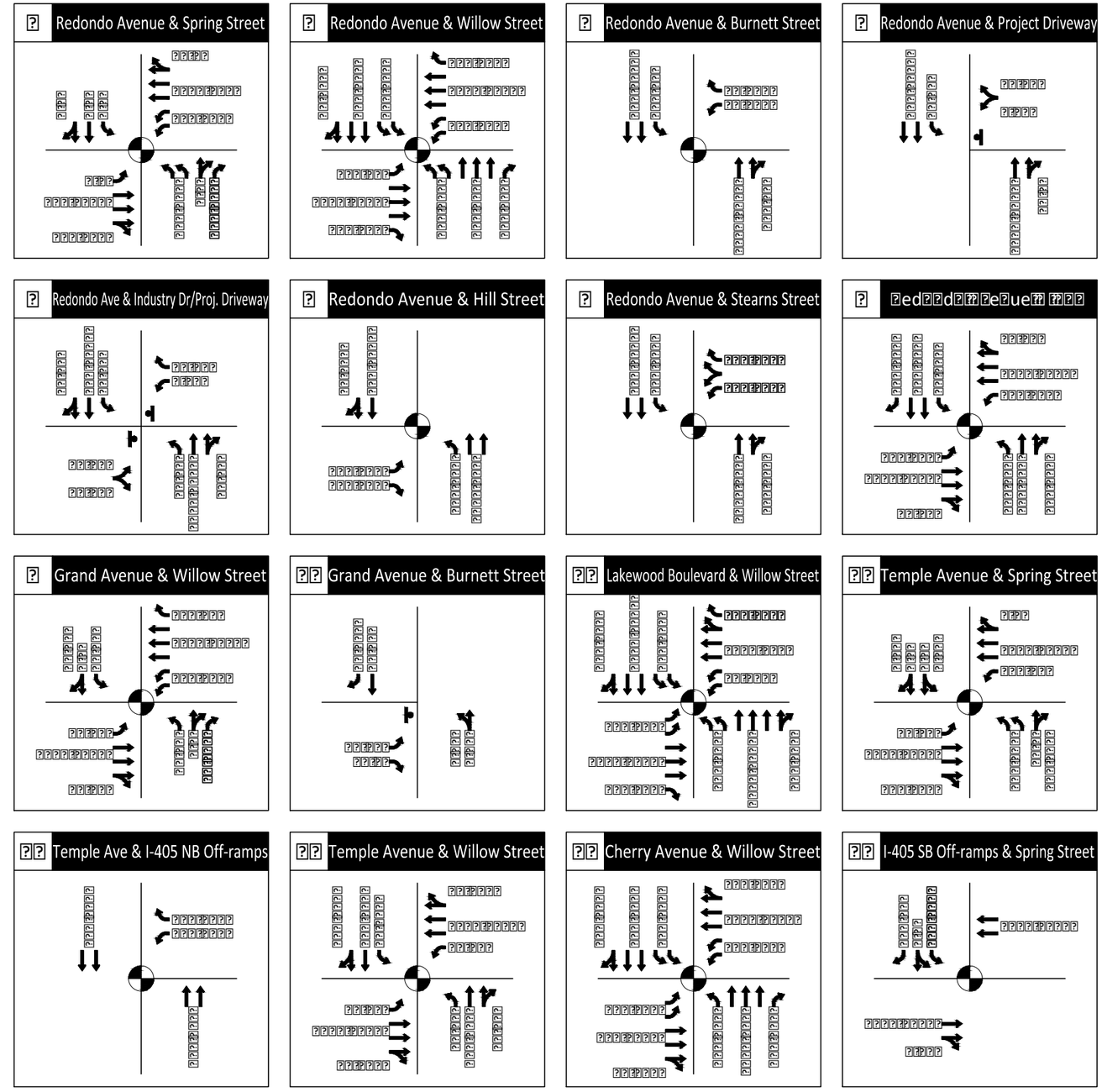
KITTELSON & ASSOCIATES

4.0 EXISTING PLUS PROJECT CONDITIONS

This section describes intersection operating conditions associated with the addition of the proposed Project traffic to the Existing Conditions. The analysis utilizes the data presented in the Existing Conditions section, plus the new activity generated by the proposed Project. The Existing Plus Project Conditions represent the existing traffic volumes and intersection configurations in year 2017 with the addition of the proposed Project traffic.

4.1 EXISTING PLUS PROJECT TRAFFIC VOLUMES

The weekday AM and PM peak hour traffic volumes generated by the proposed Project (as shown in Figure 6) were added to the Existing AM and PM peak hour traffic volumes (as shown in Figure 3). The resulting volumes are illustrated in Figure 7 and represent Existing Plus Project Conditions after addition of the proposed Project traffic to the Existing Conditions.



- Traffic Volume
- Stop Sign
- Traffic Signal

Figure

KITTELSON & ASSOCIATES

4.2 EXISTING PLUS PROJECT INTERSECTION LEVEL OF SERVICE

Existing lane configurations and traffic controls were used along with the Existing Plus Project traffic volumes to calculate the levels of service at the study intersections for the weekday AM and PM peak hours.

Table 6 shows the LOS results based on the V/C ratios or delay for the study intersections for Existing Plus Project Conditions. As shown, all intersections continue to operate at or better than the LOS D standard set forth by the City except for the following locations, which operate at LOS E or F during the weekday AM or PM peak hour after the addition of the proposed Project traffic:

- #2 – Redondo Avenue/Willow Street (LOS E during both peak hours);
- #5 – Redondo Avenue/Industry Drive-Project Driveway (LOS E during AM peak hour and LOS F during the PM peak hour);
- #8 – Redondo Avenue/PCH during (LOS E during the AM peak hour);
- #11 – Lakewood Boulevard/Willow Street (LOS F during both peak hours); and,
- #15 – Cherry Avenue/Willow Street (LOS E during the PM peak hour).

Based on the significant impact criteria presented in the methodology section, the addition of the proposed Project traffic results in a significant impact at the following locations:

- #2 – Redondo Avenue/Willow Street (LOS D worsens to LOS E during the PM peak hour);
- #5 – Redondo Avenue/Industry Drive-Project Driveway (LOS D worsens to LOS E during the AM peak hour and LOS E worsens to LOS F and signal warrants are met during the PM peak hour); and,
- #11 – Lakewood Boulevard/Willow Street (V/C ratio increases by 0.02 or more during both peak hours).

One or more signal warrants are satisfied at Intersection #5 during the PM peak hour. A significant impact does not occur at Intersection #8 as there is no change in the LOS grade after the addition of the proposed Project traffic. A significant impact does not occur at Intersection #15 as the increase in V/C caused by the addition of the proposed Project traffic is below the City's threshold of 0.02.

Mitigation measures proposed at the impacted locations are presented in the Mitigations section of this report. Detailed LOS worksheets for Existing Plus Project Conditions are presented in Appendix D.

Table 6: Intersection Level of Service - Existing Plus Project Conditions

#	Intersection	Control	Peak Hour	Existing			Existing Plus Project		
				V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS
1	Redondo Avenue/ Spring Street	Signalized	AM	0.749		C	0.775		C
			PM	0.836		D	0.859		D
2	Redondo Avenue/ Willow Street	Signalized	AM	0.806		D	0.789		C
			PM	**0.867**		**D**	**0.935**		**E**

#	Intersection	Control	Peak Hour	Existing			Existing Plus Project		
				V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS
3	Redondo Avenue/ Burnett Street	Signalized	AM	0.689		B	0.758		C
			PM	0.601		B	0.690		B
4	Redondo Avenue/ Project Driveway	TWSC	AM		27.9	D		21.9	C
			PM		17.5	C		23.6	D
5	Redondo Avenue/ Industry Drive-Project Driveway	TWSC	**AM**		**32.2**	**D**		**39.9**	**E**
			PM		**47.2**	**E**		**58.1**	**F**
6	Redondo Avenue/ Hill Street	Signalized	AM	0.734		C	0.755		C
			PM	0.784		C	0.806		D
7	Redondo Avenue/ Stearns Street	Signalized	AM	0.758		C	0.779		C
			PM	0.721		C	0.730		C
8	Redondo Avenue/ PCH	Signalized	**AM**		**56.3**	**E**		**62.2**	**E**
			PM		**48.0**	**D**		**49.3**	**D**
9	Grand Avenue/ Willow Street	Signalized	AM	0.648		B	0.667		B
			PM	0.757		C	0.784		C
10	Grand Avenue/ Burnett Street	TWSC	AM		9.0	A		9.0	A
			PM		9.4	A		9.5	A
11	Lakewood Boulevard/ Willow Street	Signalized	**AM**	**1.093**		**F**	**1.118**		**F**
			PM	**0.999**		**E**	**1.020**		**F**
12	Temple Avenue/ Spring Street	Signalized	AM	0.685		B	0.688		B
			PM	0.719		C	0.731		C
13	Temple Avenue/ I-405 Northbound Off-ramps	Signalized	AM		8.9	A		9.3	A
			PM		10.8	B		10.9	B
14	Temple Avenue/ Willow Street	Signalized	AM	0.663		B	0.689		B
			PM	0.787		C	0.789		C
15	Cherry Avenue/ Willow Street	Signalized	AM	0.862		D	0.864		D
			PM	**0.932**		**E**	**0.933**		**E**
16	I-405 Southbound Off-ramps/ Spring Street	Signalized	AM		19.8	B		20.1	C
			PM		10.0	A		10.0	A

Notes:
LOS – Level of Service
Signalized – Signal Controlled Intersection (LOS based on V/C ratios)
TWSC – Two-Way Stop Controlled (LOS based on highest delay approach)
BOLD – Intersection operating at LOS E or F
BOLD and Shaded – Significantly Impacted Intersections
Source: Kittelson & Associates, Inc., 2017

Existing Plus Project Queuing at Freeway Ramps

The 95th percentile queues at the freeway ramps were reviewed to analyze whether the addition of the proposed Project traffic would cause queuing to extend back to the freeway mainline. The 95th percentile queuing at the freeway ramps (Intersections 13 and 16) for Existing Plus Project Conditions is presented in Table 7. Similar to Existing Conditions, queuing would increase by a maximum of 20 feet and would not back up to the freeway mainline segments at either of the two freeway ramps during the Existing Plus Project Conditions.

Table 7: 95th Percentile Queuing at Freeway Ramps - Existing Plus Project Conditions

#	Intersection	Peak Hour	Ramp Storage Space (ft)	Queuing (ft)	
				Ramp Left-turn Lane	Ramp Right-turn Lane
13	Temple Avenue/ I-405 Northbound Off-ramps	AM	740	90	40
		PM		140	40
16	I-405 Southbound Off-ramps/ Spring Street	AM	860	270	210
		PM		110	50

Source: Kittelson & Associates, Inc.

Existing Plus Project Signal Warrant Analysis

At the two unsignalized study intersections, a signal warrant assessment was conducted to determine if traffic signals would be warranted due to the volume of traffic at the intersections. The results of the signal warrant analysis for the Existing Plus Project Conditions are presented in Table 8. As shown, all three signal warrants are met for both driveways on Redondo Avenue (Intersections 4 and 5). Although the signal warrants are met at Intersection 4 (Driveway 2), the intersection would operate at an acceptable LOS as a two way stop controlled intersection after the addition of the proposed Project traffic. As such, a signal is not proposed at this location. A signal is proposed at Intersection 5 (Driveway 2) as a mitigation measure.

Table 8: Signal Warrant Analysis - Existing Plus Project Conditions

#	Intersection	Peak Hour	Eight-Hour Met?	Four-Hour Met?	Peak Hour Met?
4	Redondo Avenue/ Project Driveway	AM	No	No	No
		PM	Yes	Yes	Yes
5	Redondo Avenue/ Industry Drive-Project Driveway	AM	No	No	No
		PM	Yes	Yes	Yes

Source: Kittelson & Associates, Inc.

5.0 CUMULATIVE (2019) CONDITIONS

The Cumulative (Year 2019) Conditions analysis forecasts how the study area's transportation system would operate with the full build-out of the proposed Project in combination with the growth and changes of the surrounding community by the year 2019. To derive the Cumulative (Year 2019) baseline traffic forecast volumes, approved and pending projects in the vicinity of the proposed Project site were considered.

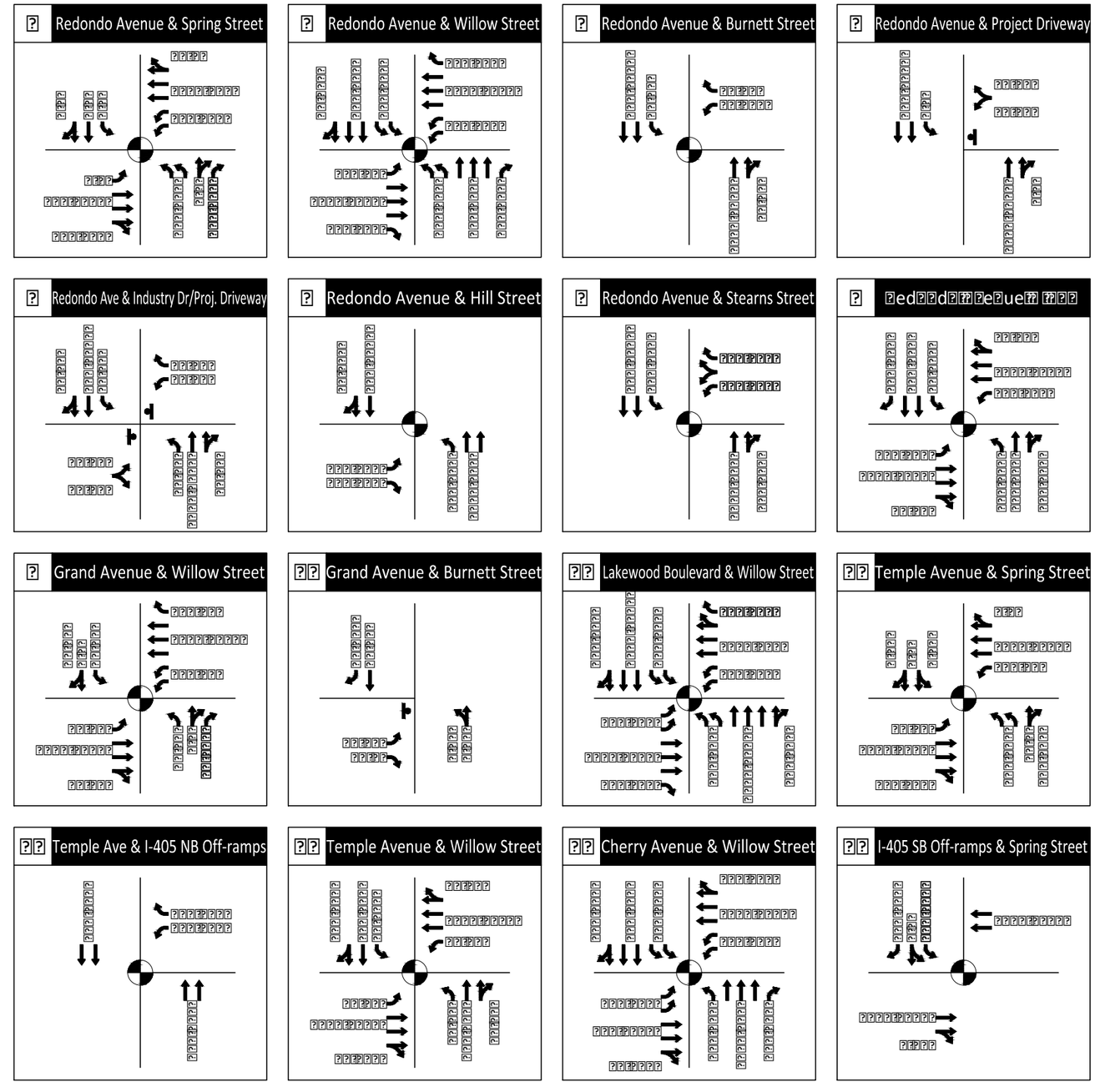
5.1 EXPECTED TRANSPORTATION IMPROVEMENTS

Based on conversations with the City staff, no roadway improvements or changes are expected to be implemented by the year 2019 in the study area. According to the City's Bicycle Master Plan[7], no improvements or changes are expected to be implemented to the bicycle facilities in the study area by the year 2019. Addition of bicycle facilities are proposed in the long-term on Lakewood Boulevard and Willow Street in the study area; however, these projects have not been funded or designed and thus were not considered in this analysis.

5.2 TRAFFIC VOLUME FORECASTING

Based on information provided by the City staff, the only approved/pending project proposed for the study area is the 125 guestroom Staybridge Suites Hotel project proposed for the northeast corner of the intersection of Lakewood Boulevard/Redondo Avenue. Per direction from the City staff, a 1% per year growth rate was applied to the Existing traffic volumes to account for the traffic expected to be generated by the future Staybridge Suites Hotel and other projects that may be proposed between now and the completion of the proposed Project in year 2019. The 1% per year growth rate applied to the Existing counts results in the Cumulative (Year 2019) Conditions traffic volumes as presented in Figure 8.

[7] Draft Bicycle Master Plan, City of Long Beach, December 2016.



- Traffic Volume
- Stop Sign
- Traffic Signal

Figure

5.3 CUMULATIVE (2019) INTERSECTION LEVEL OF SERVICE

The Cumulative (2019) Conditions traffic counts presented in Figure 9 were added to the existing street network to calculate the levels of service at the study intersections for the weekday AM and PM peak hours. Table 9 shows the LOS results based on the V/C ratios or delay for the study intersections for Cumulative (2019) Conditions. As shown, all intersections operate at or better than the LOS D standard set forth by the City except for the following locations, which operate at LOS E or F during the AM or PM peak hour:

- #5 – Redondo Avenue/Industry Drive (LOS F during the PM peak hour);
- #8 – Redondo Avenue/PCH (LOS E during the AM peak hour);
- #11 – Lakewood Boulevard/Willow Street (LOS F during both peak hours); and,
- #15 – Cherry Avenue/Willow Street (LOS E during the PM peak hour).

Detailed LOS worksheets for Cumulative (2019) Conditions are presented in Appendix E.

Table 9: Intersection Level of Service - Cumulative (2019) Conditions

#	Intersection	Control	Peak Hour	Cumulative (2019)		
				V/C	Delay (s/veh)	LOS
1	Redondo Avenue/ Spring Street	Signalized	AM	0.761		C
			PM	0.849		D
2	Redondo Avenue/ Willow Street	Signalized	AM	0.818		D
			PM	0.882		D
3	Redondo Avenue/ Burnett Street	Signalized	AM	0.701		C
			PM	0.610		B
4	Redondo Avenue/ Project Driveway	TWSC	AM		28.9	D
			PM		17.9	C
5	Redondo Avenue/ Industry Drive-Project Driveway	TWSC	AM		33.4	D
			PM		**52.1**	**F**
6	Redondo Avenue/ Hill Street	Signalized	AM	0.746		C
			PM	0.797		C
7	Redondo Avenue/ Stearns Street	Signalized	AM	0.770		C
			PM	0.734		C
8	Redondo Avenue/ PCH	Signalized	**AM**		**60.7**	**E**
			PM		50.2	D
9	Grand Avenue/ Willow Street	Signalized	AM	0.658		B
			PM	0.769		C
10	Grand Avenue/ Burnett Street	TWSC	AM		9.0	A
			PM		9.4	A
11	Lakewood Boulevard/ Willow Street	Signalized	**AM**	**1.112**		**F**
			PM	**1.017**		**F**
12	Temple Avenue/ Spring Street	Signalized	AM	0.696		B
			PM	0.730		C
13	Temple Avenue/ I-405 Northbound Off-ramps	Signalized	AM		9.0	A
			PM		11.0	B
14	Temple Avenue/ Willow Street	Signalized	AM	0.673		B
			PM	0.800		D
15	Cherry Avenue/ Willow Street	Signalized	AM	0.876		D
			PM	**0.947**		**E**
16	I-405 Southbound Off-ramps/ Spring Street	Signalized	AM		20.2	C
			PM		10.0	B

Notes:
LOS – Level of Service
Signalized – Signal Controlled Intersection (LOS based on V/C ratios)
TWSC – Two-Way Stop Controlled (LOS based on highest delay approach)
BOLD – Intersection operating at LOS E or F
Source: Kittelson & Associates, Inc., 2017

Cumulative (2019) Queuing at Freeway Ramps

The 95th percentile queues at the freeway ramps were reviewed to analyze whether queuing extends back to the freeway mainline. The 95th percentile queuing at the freeway ramps (Intersections 13 and 16) for Cumulative (2019) Conditions is presented in Table 10. As shown, queuing would not back up to the freeway mainline segments at either of the two freeway ramps during the Cumulative (2019) Conditions.

Table 10: 95th Percentile Queuing at Freeway Ramps - Cumulative (2019) Conditions

#	Intersection	Peak Hour	Ramp Storage Space (ft)	Queuing (ft)	
				Ramp Left-turn Lane	Ramp Right-turn Lane
13	Temple Avenue/ I-405 Northbound Off-ramps	AM	740	80	40
		PM		140	40
16	I-405 Southbound Off-ramps/ Spring Street	AM	860	260	220
		PM		110	50

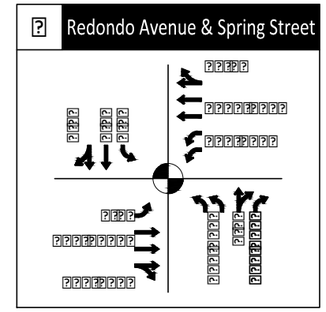
Source: Kittelson & Associates, Inc.

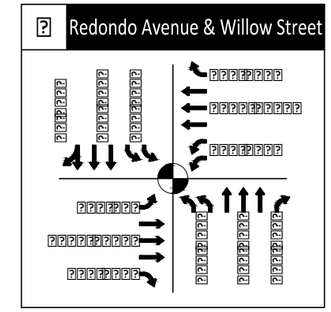
6.0 CUMULATIVE (2019) PLUS PROJECT CONDITIONS

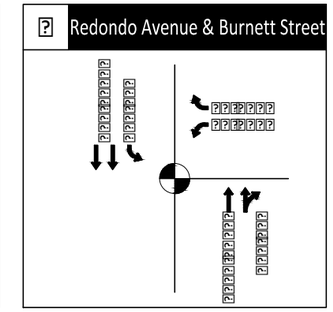
This section describes intersection operating conditions associated with the addition of the proposed Project traffic to the Cumulative (2019) Conditions.

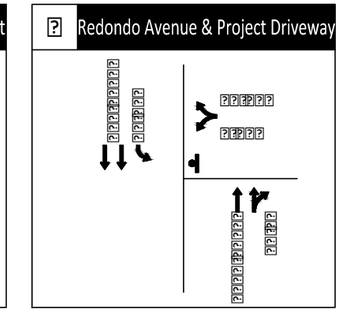
6.1 CUMULATIVE (2019) PLUS PROJECT TRAFFIC VOLUMES

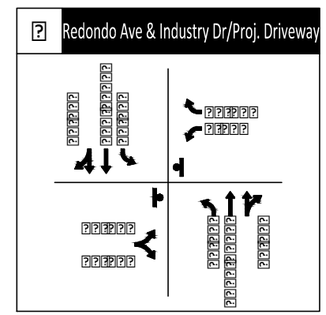
The weekday AM and PM peak hour traffic volumes generated by the proposed Project (as shown in Figure 6) were added to the Cumulative (2019) Conditions AM and PM peak hour traffic volumes (as shown in Figure 8). The resulting volumes are illustrated in Figure 9 and represent Cumulative (2019) Plus Project Conditions after addition of the proposed Project traffic to the Cumulative (2019) Conditions.

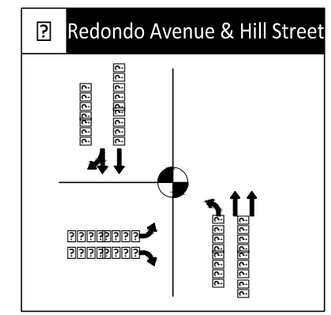


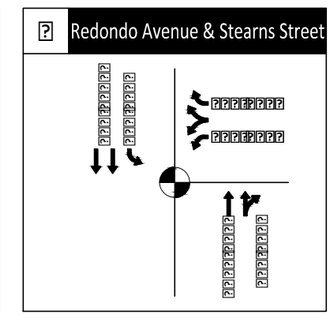


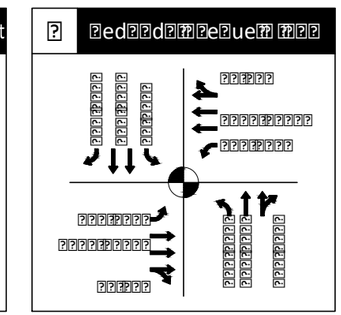


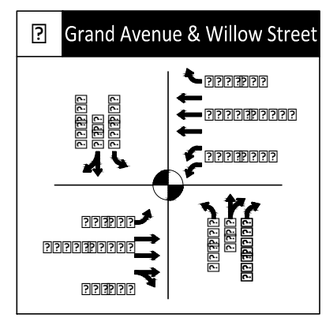


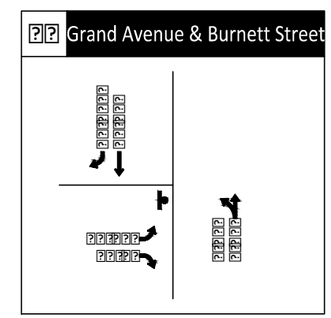


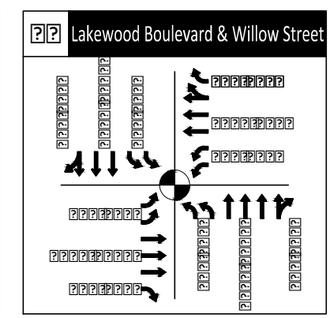


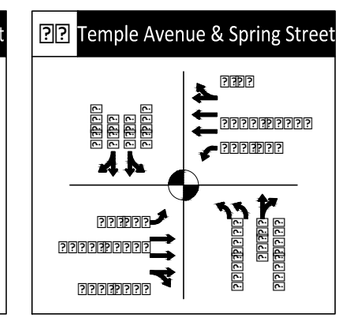


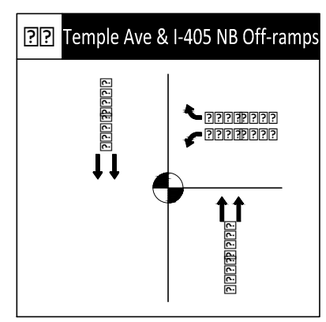


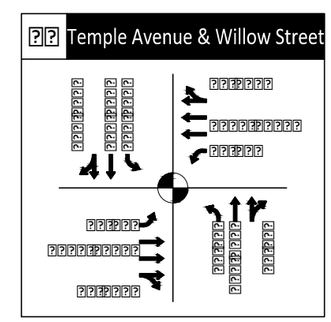


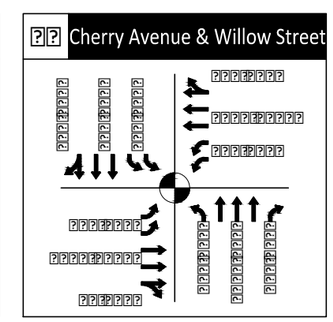


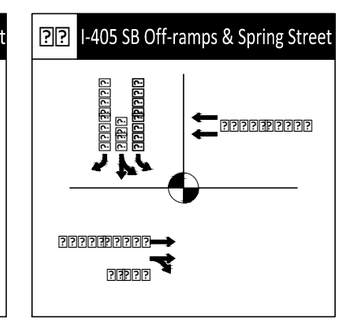












- Traffic Volume
- Stop Sign
- Traffic Signal

Figure

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6.2 CUMULATIVE (2019) PLUS PROJECT INTERSECTION LEVEL OF SERVICE

The Cumulative (2019) Plus Project traffic volumes were added to the existing street network to calculate the levels of service at the study intersections for the AM and PM peak hours.

Table 11 shows the LOS results based on the V/C ratios or delay for the study intersections for Cumulative (2019) Plus Project Conditions. As shown, all intersections continue to operate at or better than the LOS D standard set forth by the City except for the following locations, which operate at LOS E or F during the AM or PM peak hour after the addition of the proposed Project traffic:

- #2 – Redondo Avenue/Willow Street (LOS E during the PM peak hour);
- #5 – Redondo Avenue/Industry Drive (LOS E during the AM peak hour and LOS F during the PM peak hour);
- #8 – Redondo Avenue/PCH (LOS E during the AM peak hour);
- #11 – Lakewood Boulevard/Willow Street (LOS F during both peak hours);
- #15 – Cherry Avenue/Willow Street (LOS E during the PM peak hours).

Based on the significant impact criteria presented in the methodology section, the addition of the proposed Project traffic results in a significant impact at the following locations:

- #2 – Redondo Avenue/Willow Street (LOS D worsens to LOS E during the PM peak hour);
- #5 – Redondo Avenue/Industry Drive (LOS D worsens to LOS E during the AM peak hour and signal warrants are met with the intersection operating at LOS F during the PM peak hour); and,
- #11 – Lakewood Boulevard/Willow Street (V/C ratio increases by 0.02 or more during both peak hours).

A significant impact does not occur at Intersection #8 as there is no change in the LOS grade after the addition of the proposed Project traffic. A significant impact does not occur at Intersection #15 as the increase in V/C caused by the addition of the proposed Project traffic is below the City's threshold of 0.02.

Mitigation measures proposed at the impacted locations are presented in the Mitigations section of this report. Detailed LOS worksheets for Cumulative (2019) Plus Project Conditions are presented in Appendix F.

Table 11: Intersection Level of Service - Cumulative (2019) Plus Project Conditions

#	Intersection	Control	Peak Hour	Cumulative (2019)			Cumulative (2019) Plus Project		
				V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS
1	Redondo Avenue/ Spring Street	Signalized	AM	0.761		C	0.778		C
			PM	0.849		D	0.873		D
2	Redondo Avenue/ Willow Street	Signalized	AM	0.818		D	0.801		D
			PM	**0.882**		**D**	**0.949**		**E**
3	Redondo Avenue/ Burnett Street	Signalized	AM	0.701		C	0.769		C
			PM	0.610		B	0.698		B
4	Redondo Avenue/ Project Driveway	TWSC	AM		28.9	D		22.5	C
			PM		17.9	C		24.3	C
5	Redondo Avenue/ Industry Drive-Project Driveway	TWSC	**AM**		**33.4**	**D**		**42.0**	**E**
			PM		**52.1**	**F**		**64.9**	**F**
6	Redondo Avenue/ Hill Street	Signalized	AM	0.746		C	0.767		C
			PM	0.797		C	0.819		D
7	Redondo Avenue/ Stearns Street	Signalized	AM	0.770		C	0.791		C
			PM	0.734		C	0.742		C
8	Redondo Avenue/ PCH	Signalized	**AM**		**60.7**	**E**		**66.5**	**E**
			PM		50.2	D		51.5	D
9	Grand Avenue/ Willow Street	Signalized	AM	0.658		B	0.676		B
			PM	0.769		C	0.797		C
10	Grand Avenue/ Burnett Street	TWSC	AM		9.0	A		9.0	A
			PM		9.4	A		9.6	A
11	Lakewood Boulevard/ Willow Street	Signalized	**AM**	**1.112**		**F**	**1.138**		**F**
			PM	**1.017**		**F**	**1.037**		**F**
12	Temple Avenue/ Spring Street	Signalized	AM	0.696		B	0.699		B
			PM	0.730		C	0.741		C
13	Temple Avenue/ I-405 Northbound Off-ramps	Signalized	AM		9.0	A		9.4	A
			PM		11.0	B		11.1	B
14	Temple Avenue/ Willow Street	Signalized	AM	0.673		B	0.700		B
			PM	0.800		D	0.802		D
15	Cherry Avenue/ Willow Street	Signalized	AM	0.876		D	0.877		D
			PM	**0.947**		**E**	**0.949**		**E**
16	I-405 Southbound Off-ramps/ Spring Street	Signalized	AM		20.2	C		20.5	C
			PM		10.0	B		10.1	B

Notes:
LOS – Level of Service
Signalized – Signal Controlled Intersection (LOS based on volume weighted average of delay for all approaches)
TWSC – Two-Way Stop Controlled (LOS based on highest delay approach)
BOLD – Intersections operating at LOS E or F
BOLD and Shaded – Significantly Impacted Intersections
Source: Kittelson & Associates, Inc., 2017

Cumulative (2019) Plus Project Queuing at Freeway Ramps

The 95th percentile queues at the freeway ramps were reviewed to analyze whether the addition of the proposed Project traffic would cause queuing to extend back to the freeway mainline. The 95th percentile queuing at the freeway ramps (Intersections 13 and 16) for Cumulative (2019) Plus Project Conditions is presented in Table 12. Similar to Cumulative (2019) Conditions, queuing would increase by a maximum of 20 feet and would not back up to the freeway mainline segments at either of the two freeway ramps during the Cumulative (2019) Plus Project Conditions.

Table 12: 95th Percentile Queuing at Freeway Ramps - Cumulative (2019) Plus Project Conditions

#	Intersection	Peak Hour	Ramp Storage Space (ft)	Queuing (ft)	
				Ramp Left-turn Lane	Ramp Right-turn Lane
13	Temple Avenue/ I-405 Northbound Off-ramps	AM	740	90	40
		PM		140	40
16	I-405 Southbound Off-ramps/ Spring Street	AM	860	280	220
		PM		110	50

Source: Kittelson & Associates, Inc.

Cumulative (2019) Plus Project Signal Warrant Analysis

At the two unsignalized study intersections, a signal warrant assessment was conducted to determine if traffic signals would be warranted due to the volume of traffic at the intersections. The results of the signal warrant analysis for the Cumulative (2019) Plus Project Conditions are presented in Table 13. As shown, all three signal warrants are met for both driveways on Redondo Avenue (Intersections 4 and 5) during the PM peak hour. Although the signal warrants are met at Intersection 4 (Driveway 2), the intersection would operate at an acceptable LOS as a two way stop controlled intersection after the addition of the proposed Project traffic. As such, a signal is not proposed at this location. A signal is proposed at Intersection 5 (Driveway 2) as a mitigation measure.

Table 13: Signal Warrant Analysis - Cumulative (2019) Plus Project Conditions

#	Intersection	Peak Hour	Eight-Hour Met?	Four-Hour Met?	Peak Hour Met?
4	Redondo Avenue/ Project Driveway	AM	No	No	No
		PM	Yes	Yes	Yes
5	Redondo Avenue/ Industry Drive-Project Driveway	AM	No	No	No
		PM	Yes	Yes	Yes

Source: Kittelson & Associates, Inc.

7.0 MITIGATIONS

This section presents the proposed mitigation measures to alleviate the significant impacts caused by adding the proposed Project trips to the study intersections. The operating conditions with the mitigation measures implemented were analyzed and compared with the significant impacts found for the Existing Plus Project and Cumulative (2019) Plus Project Conditions.

7.1 SIGNIFICANT IMPACTS

The addition of the proposed Project traffic would result in significant impacts at the following study intersections during the Existing Plus Project and Cumulative (2019) Plus Project Conditions:

- #2 – Redondo Avenue/Willow Street (PM peak hour);
- #5 – Redondo Avenue/Industry Drive (PM peak hour); and,
- #11 – Lakewood Boulevard/Willow Street (both peak hours).

7.2 SPECIFIC INTERSECTION IMPROVEMENTS

Intersection improvements designed to alleviate the significant impacts at study intersections were considered and are identified in this section.

The following is a list of specific mitigations identified for the significantly impacted study intersections:

- #2 – Redondo Avenue/Willow Street: The signal timing should be modified to accommodate the traffic expected at this location. The signal currently operates at a cycle length of 120 seconds. Preliminary analysis shows that the cycle length should be extended to 180 seconds; however, a detailed signal timing study would need to be conducted to confirm the optimal cycle length.
- #5 – Redondo Avenue/Industry Drive: The intersection meets traffic signal warrants for both Existing Plus Project and Cumulative (2019) Plus Project Conditions. As such, a two-phase traffic signal should be installed at this location. The existing two-way left-turn lane in the southbound direction would be converted into a left-turn lane but no additional right of way would be required to implement the installation of a signal. For the purposes of this analysis, the signal timing for the proposed signal was optimized in the Vistro software. However, a detailed signal timing study should be conducted before installation of the signal. Queuing analysis at this location with the proposed signal shows that queues will not back up to adjacent intersections.
- #11 – The signal timing should be modified to accommodate the traffic expected at this location. The signal currently operates at a cycle length of 120 seconds. Preliminary analysis shows that the cycle length should be extended to 130 seconds; however, a detailed signal timing study would need to be conducted to confirm the optimal cycle length.

7.3 INTERSECTION LEVEL OF SERVICE WITH MITIGATION

This section provides the change in the level of service results after implementation of the proposed mitigations measures at the impacted study intersections for Existing Plus Project and Cumulative (2019) Plus Project Conditions.

Existing Plus Project Conditions

Table 14 shows a comparison between results under the Existing Condition and the results with the proposed mitigation measures implemented at the study intersections. As shown, the proposed mitigation measures improve the LOS to an acceptable level based on City standards and reduce the impacts to less-than-significant levels during the Existing Plus Project Conditions.

Detailed LOS worksheets for Existing Plus Project with Mitigation Conditions are presented in Appendix G.

Table 14: Intersection Level of Service - Existing Plus Project with Mitigation Conditions

#	Intersection	Peak Hour	Existing			Existing Plus Project with Mitigation		
			V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS
2	Redondo Avenue/ Willow Street	AM	0.806		D	0.739		C
		PM	0.867		D	0.885		D
5	Redondo Avenue/ Industry Drive-Project Driveway	AM		32.2	D		4.8	A
		PM		**47.2**	**E**		7.4	A
11	Lakewood Boulevard/ Willow Street	**AM**	**1.093**		**F**	**1.107**		**F**
		PM	**0.999**		**E**	**1.009**		**F**

Notes:
LOS – Level of Service
BOLD – Intersections operating at LOS E or F
Source: Kittelson & Associates, Inc., 2017

Cumulative (2019) Plus Project Conditions

Table 15 shows a comparison between results under the Cumulative (2019) Conditions and the results with the proposed mitigation measures implemented at the study intersections. As shown, the proposed mitigation measures improve the LOS to an acceptable level based on City standards and reduce the impacts to less-than-significant levels during the Cumulative (2019) Plus Project Conditions.

Detailed LOS worksheets for Cumulative (2019) Plus Project with Mitigation Conditions are presented in Appendix H.

Table 15: Intersection Level of Service - Cumulative (2019) Plus Project with Mitigation Conditions

#	Intersection	Peak Hour	Cumulative (2019)			Cumulative (2019) Plus Project with Mitigation		
			V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS
2	Redondo Avenue/ Willow Street	AM	0.818		D	0.751		C
		PM	0.882		D	0.899		D
5	Redondo Avenue/ Industry Drive-Project Driveway	AM		33.4	D		5.0	A
		PM		**52.1**	**F**		7.5	A
11	Lakewood Boulevard/ Willow Street	**AM**	**1.112**		**F**	**1.126**		**F**
		PM	**1.017**		**F**	**1.026**		**F**

Notes:
LOS – Level of Service
BOLD – Intersections operating at LOS E or F
Source: Kittelson & Associates, Inc., 2017

8.0 SITE ACCESS AND CIRCULATION

This section describes the access and on-site circulation for the proposed Project site.

8.1 SITE ACCESS

As shown in the site plan provided in Figure 2, site access would be provided via two driveways on Redondo Avenue and four driveways on Burnett Street (referred to as Driveways 1 to 6). The driveways provide access to the proposed Project site as follows:

- Driveway 1
  - Located on Redondo Avenue and aligned with Industry Drive
  - Access to Building 1 parking spaces and circulation aisles
  - Primary truck access to Building 1 loading areas
- Driveway 2
  - Located midblock between Burnett Street and Industry Drive on Redondo Avenue
  - Access to the entire site
- Driveway 3
  - Located on Burnett Street
  - Access to Building 2 parking spaces and circulation aisles
- Driveway 4
  - Located on Burnett Street
  - Access to Building 2 parking spaces and circulation aisles
  - Primary truck access to Building 2 loading areas
- Driveway 5
  - Located on Burnett Street
  - Access to Building 3 parking spaces and circulation aisles
- Driveway 6
  - Located on Burnett Street
  - Access to Building 3 parking spaces and circulation aisles
  - Primary truck access to Building 3 loading areas

The surface parking spaces and circulating aisles surround all three buildings. As currently proposed, all inbound movements on Redondo Avenue and Burnett Street would remain uncontrolled at the proposed Project driveways. All outbound movements at the driveways would be stop controlled.

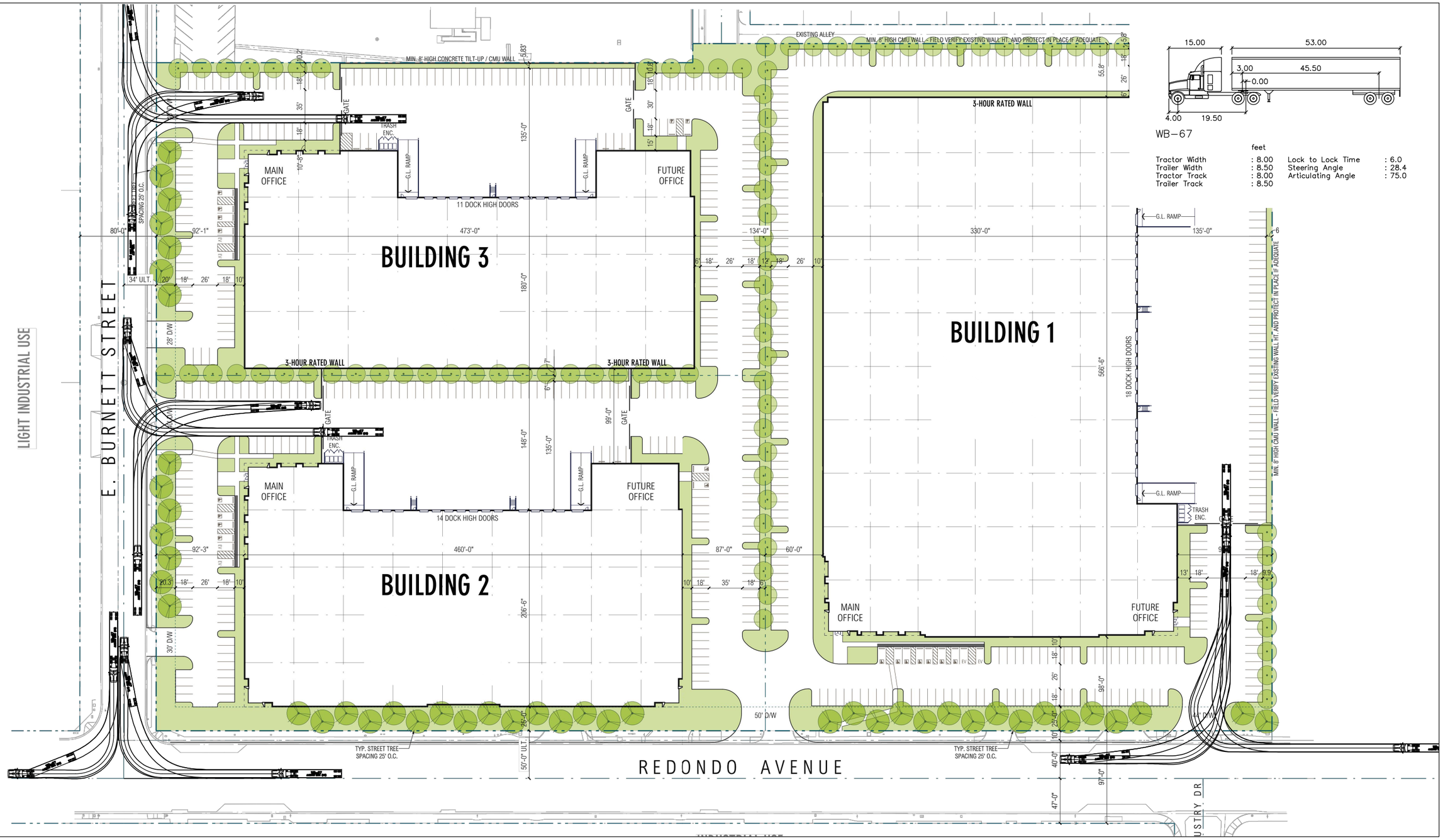
A qualitative review of the access points found that inbound vehicles making a right-turn into the proposed Project site at any of the driveways are not expected to experience any queuing as these inbound movements would be uncontrolled internal to the proposed Project site. Inbound vehicles making a left-turn into the proposed Project site at either of the driveways are expected to experience minimal queuing. Any queuing that would occur for the outbound movements will occur on the proposed Project site and would not affect City streets.

8.2 SITE CIRCULATION

As shown in the site plan in Figure 2, the surface parking spaces and circulation areas for Building 1 would be located on all four sides of the building and the surface parking spaces and circulation areas for Buildings 2 and 3 would be located on the north, east and south sides of each building. The proposed Project site consists of planted medians that would prevent connectivity between the three buildings. Connection between Building 1 and Buildings 2 and 3 would be provided next to Driveway 2. Connection between Building 2 and Building 3 would be provided in the circulation aisle located south of both buildings.

The truck loading area for Building 1 is located on the south side of the building, the truck loading area for Building 2 is located on the east side of the building, and the truck loading area for Building 3 is located on the east side of the building. Gates are located at the truck loading areas for each building delineating these loading areas from the rest of the parking areas. For the purposes of this analysis, it was assumed that these gates would remain open during the day and not hinder the circulation of the proposed Project site.

Truck turning movements for WB-67 trucks were analyzed using the AutoTURN software to ensure that the proposed Project site plan provided enough space for large trucks to turn into and out of the proposed Project site. Truck turning templates for right-turning movements are provided in Figure 10, truck turning templates for left-turning movements are provided in Figure 11, and truck turning templates for internal loading movements are provided in Figure 12. As shown in these figures, the proposed site plan provides adequate space for all trucks to turn into and out of the proposed Project site in one movement without crossing the centerline on City streets. The proposed site plan also provides enough internal enough for trucks to reverse into the loading and unloading areas.



Truck Turns Right In/Right Out
S.E. Corner Of Redondo Ave. & Burnett Street

Figure
10

KITTELSON & ASSOCIATES

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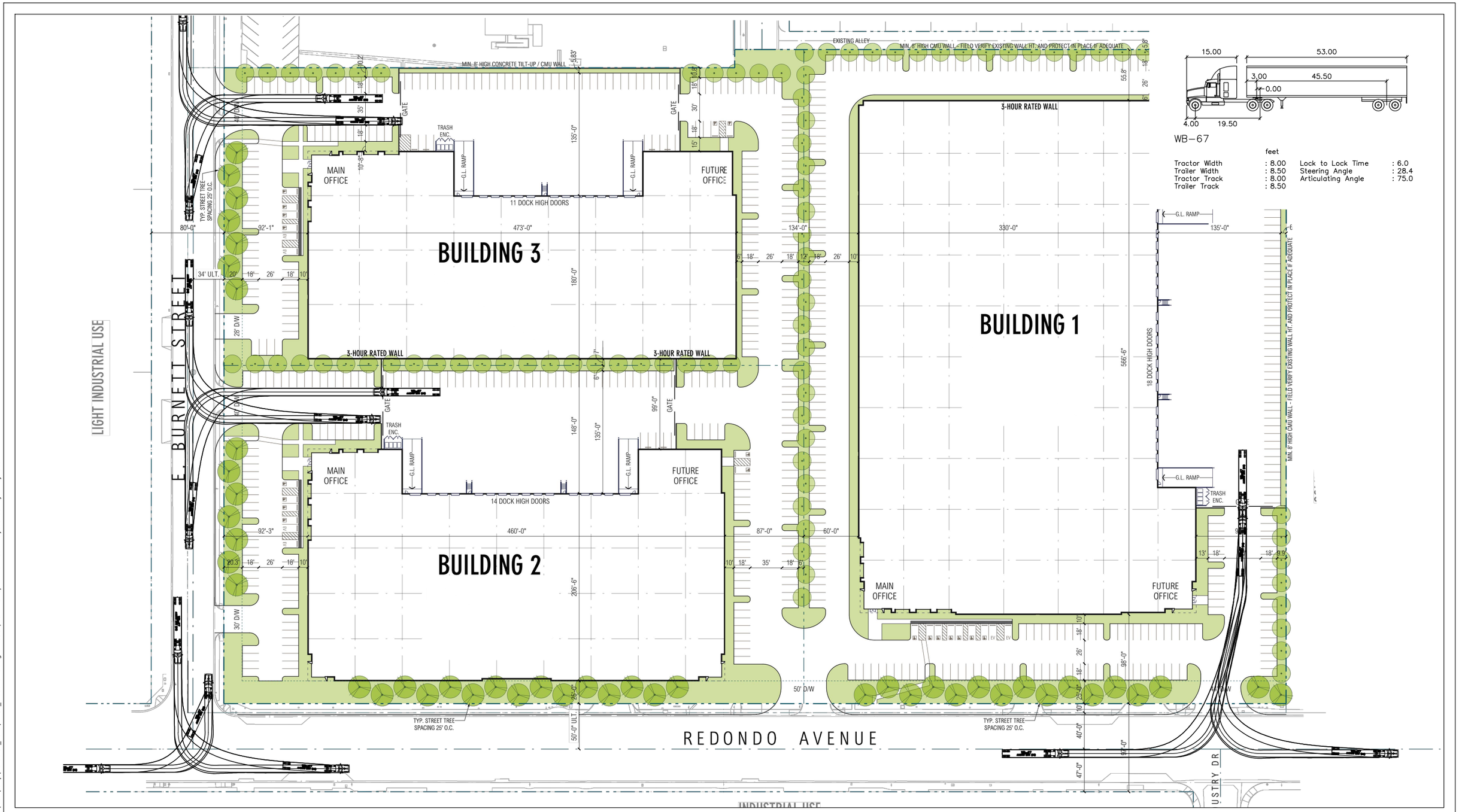

Truck Turns Left In/Left Out
S.E. Corner Of Redondo Ave. & Burnett Street

Figure **11**

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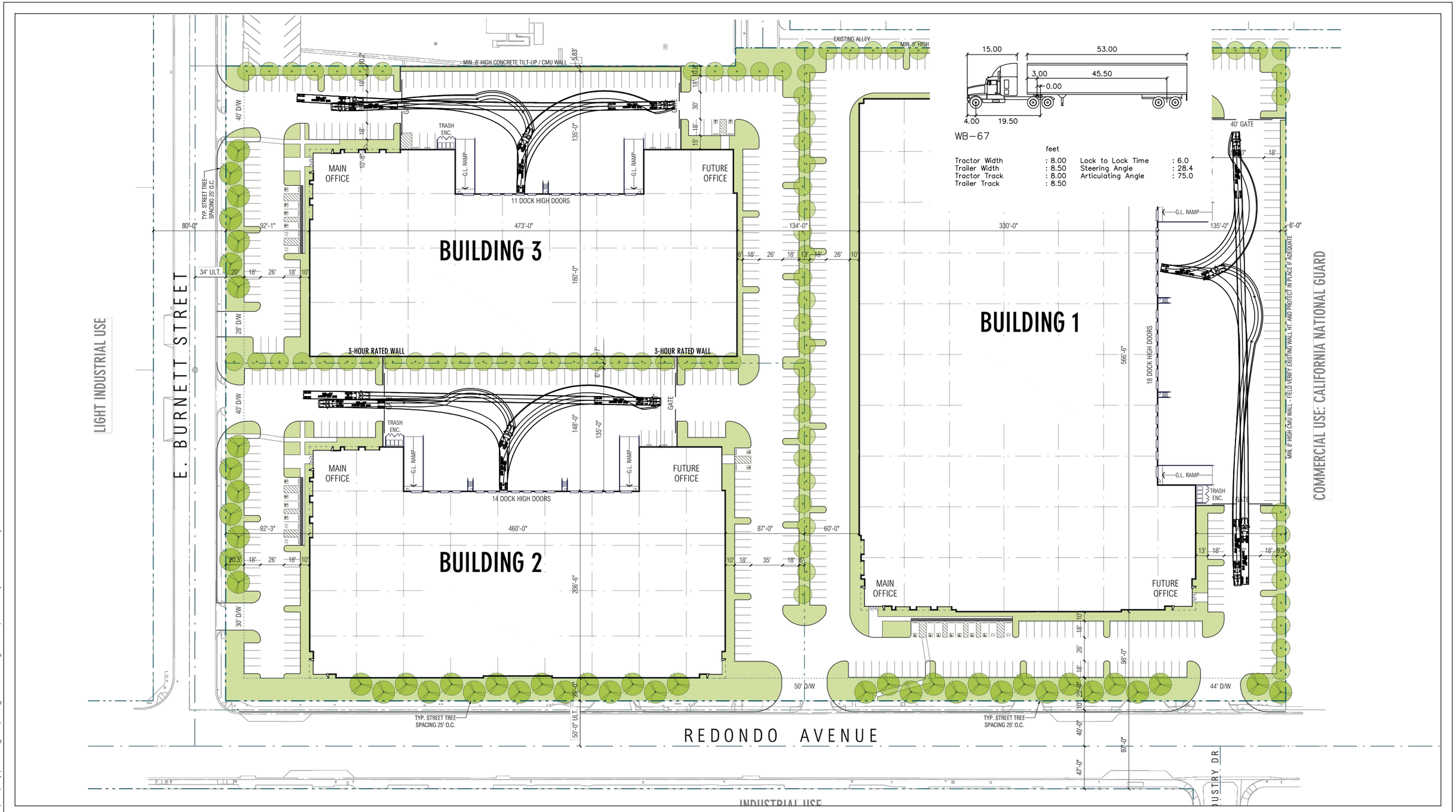

Truck Turns Within Site
S.E. Corner Of Redondo Ave. & Burnett Street

Figure **12**

C:\Users\hahmed\appdata\local\temp\AcPublish_7020\21730_Truck Turns.dwg Dec 07, 2017 - 3:23pm - hahmed Layout Tab: Site Movements

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9.0 CONCLUSIONS AND FINDINGS

The proposed Project includes the demolition of the existing USPS facility (323,933 square-foot mail processing building and an 11,456 square-foot vehicle maintenance facility). The new development would consist of three buildings with 427,565 square feet (sf) of manufacturing space with office and warehousing space to support the manufacturing tenants. In addition, 638 parking spaces would be provided.

Based on the City's significant impact criteria, it is expected that the addition of the proposed Project traffic would cause a significant impact at the following study intersections during Existing Plus Project Conditions and the Cumulative (2019) Plus Project Conditions:

- #2 – Redondo Avenue/Willow Street (PM peak hour);
- #5 – Redondo Avenue/Industry Drive (PM peak hour); and,
- #11 – Lakewood Boulevard/Willow Street (both peak hours).

To mitigate the significant impacts, modification to the signal timing was proposed at Intersections #2 and #11 and the installation of a traffic signal is proposed at Intersection #5, which is currently unsignalized. The implementation of these mitigation measures would reduce the impacts to less-than-significant levels during both Existing Plus Project and Cumulative (2019) Plus Project conditions. The proposed traffic signal at Intersection #5 would be warranted during both scenarios and queuing analysis showed that queues will not extend to adjacent intersections.

Based on the proposed Project site plan, no issues were identified with site access and circulation and no excessive queuing at the proposed Project driveways is expected to occur on any City streets.

Appendix A

Traffic Count Data

Prepared by National Data & Surveying Services

Redondo Ave & Spring St

Peak Hour Turning Movement Count

ID: 17-5595-001
City: Long Beach

Day: Wednesday
Date: 09/13/2017

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

SOUTHBOUND (Redondo Ave)

AM	1	2	5	0	15	AM
NOON	0	0	0	0	0	NOON
PM	3	3	5	0	9	PM
	0.5	1.5	1	0		

EASTBOUND (Spring St)

AM	NOON	PM		
1832	0	1457		
0	0	5	0	
3	0	4	1	
729	0	1085	3	
338	0	388	0	

WESTBOUND (Spring St)

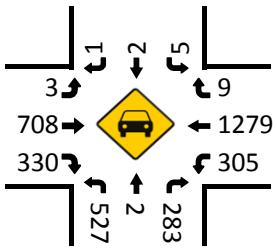
	PM	NOON	AM
0	5	0	10
3	894	0	1296
2	237	0	313
0	0	1	
	1469	0	1021

NORTHBOUND (Redondo Ave)

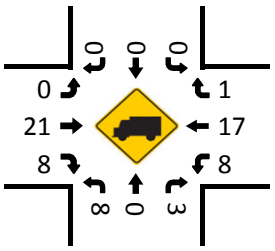
	0	2	0.5	1.5		
PM	628	0	555	0	379	PM
NOON	0	0	0	0	0	NOON
AM	653	0	535	2	286	AM

CONTROL			
Signalized			
TEV	3521	0	3563
	AM	NOON	PM
PHF	0.91		0.89

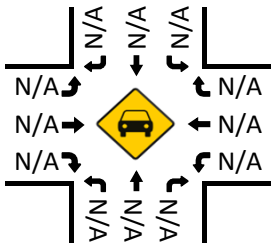
Cars (AM)



HT (AM)



Cars (NOON)



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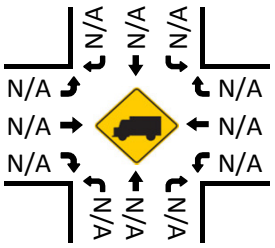

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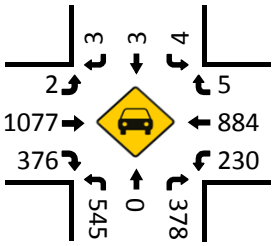

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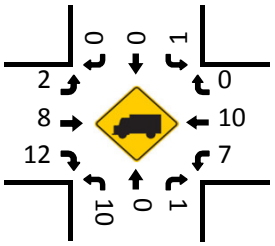
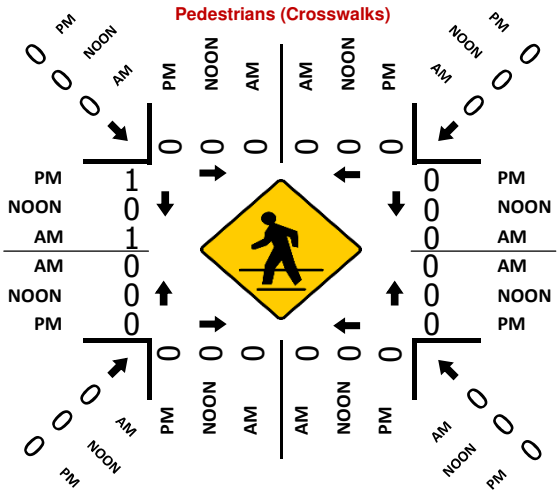


Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Redondo Ave & Willow St

Peak Hour Turning Movement Count

ID: 17-5595-002
City: Long Beach

Day: Wednesday
Date: 09/13/2017

PEAK HOURS	COUNT PERIODS
07:15 AM - 08:15 AM	07:00 AM - 09:00 AM
NONE	NONE
04:45 PM - 05:45 PM	04:00 PM - 06:00 PM

SOUTHBOUND (Redondo Ave)

AM	48	358	108	0	1320	AM
NOON	0	0	0	0	0	NOON
PM	124	641	271	0	771	PM
	0	3	2	0		

EASTBOUND (Willow St)

AM	NOON	PM	
1625	0	1365	
2	0	2	0
116	0	66	1
1020	0	1521	3
159	0	285	1

WESTBOUND (Willow St)

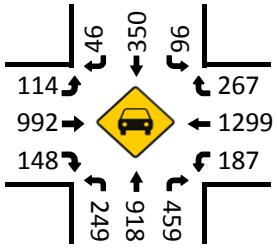
	PM	NOON	AM
1	122	0	275
3	1030	0	1322
2	247	0	196
0	0	0	0
	2200	0	1593

NORTHBOUND (Redondo Ave)

PM	1173	0	209	583	408	PM
NOON	0	0	0	0	0	NOON
AM	714	1	253	929	465	AM
		0	2	3	1	

CONTROL			
Signalized			
TEV	5252 AM	0 NOON	5509 PM
PHF	0.94		0.94

Cars (AM)



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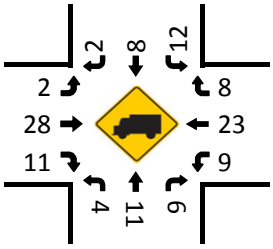
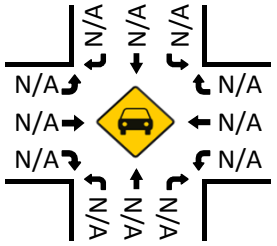
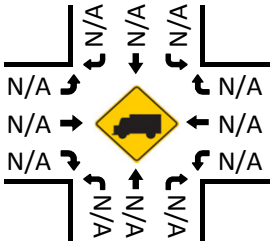


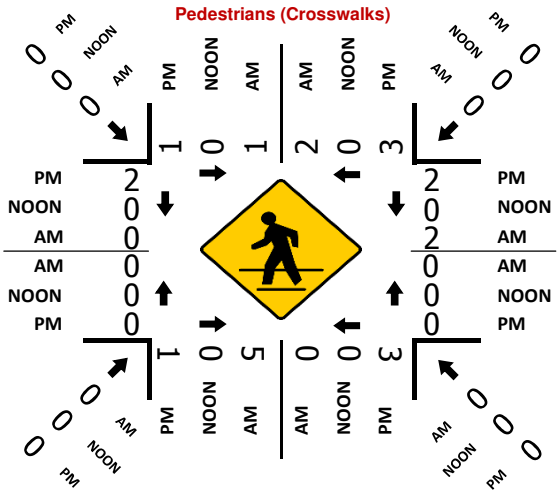
Cars (NOON)



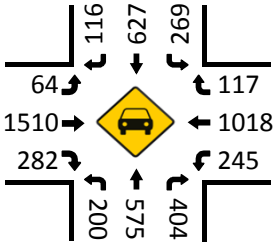
HT (NOON)



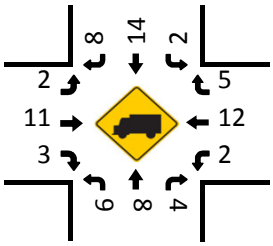
Pedestrians (Crosswalks)



Cars (PM)



HT (PM)



Prepared by National Data & Surveying Services

Redondo Ave & Burnett St

Peak Hour Turning Movement Count

ID: 17-5595-003
City: Long Beach

Day: Wednesday
Date: 09/13/2017

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

Redondo Ave – SOUTHBOUND

	U-Turn	Left	Through	Right	Northbound departure (approach volume total)
AM	0	787	31	0	1547
NOON	0	0	0	0	0
PM	0	1190	10	0	1204
Lanes	0	2	1	0	

Burnett St – EASTBOUND

	AM	NOON	PM	Lanes
Departure	0	0	0	
U-Turn	0	0	0	0
Left	0	0	0	0
Through	0	0	0	0
Right	0	0	0	0

Burnett St – WESTBOUND

	Lanes	PM	NOON	AM
Right	1	52	0	23
Through	0	0	0	0
Left	1	103	0	29
U-Turn	0	0	0	0
Departure		48	0	115

Redondo Ave – NORTHBOUND

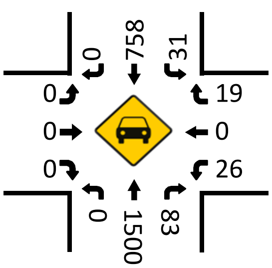
	Departure	U-Turn	Left	Through	Right
Lanes		0	0	2	0
PM	1293	0	0	1152	38
NOON	0	0	0	0	0
AM	816	0	0	1524	84

CONTROL

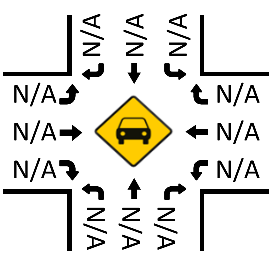
Signalized

	AM	NOON	PM
TEV	2478	0	2545
PHF	0.95		0.92

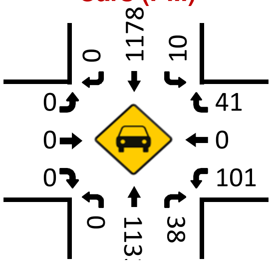
Cars (AM)



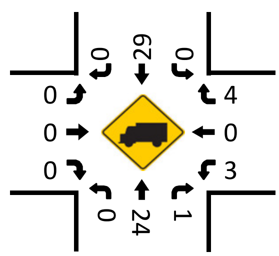
Cars (NOON)



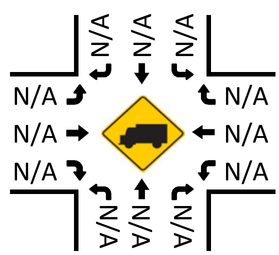
Cars (PM)



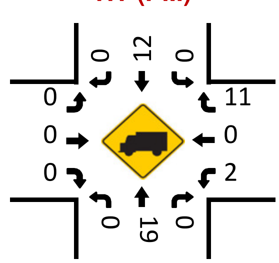
HT (AM)



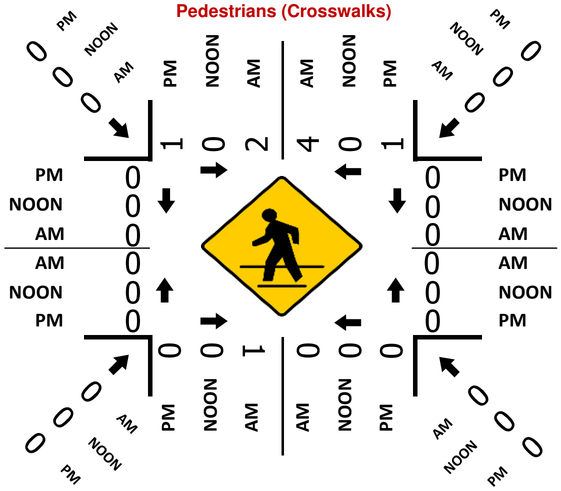
HT (NOON)



HT (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Redondo Ave & Project Dwy

Peak Hour Turning Movement Count

ID: 17-5595-004
City: Long Beach

Day: Wednesday
Date: 09/13/2017

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

Redondo Ave — SOUTHBOUND

	Right	Through	Left	U-Turn	Departing
AM	0	820	0	0	1619
NOON	0	0	0	0	0
PM	0	1247	0	0	1206
	0	2	0	0	

Project Dwy — WESTBOUND

	PM	NOON	AM	
Right	62	0	31	0
Through	0	0	0	1
Left	10	0	15	0
U-Turn	0	0	0	0
Departing	0	0	0	

Project Dwy — EASTBOUND

	AM	NOON	PM	
Departing	0	0	0	
U-Turn	0	0	0	0
Left	3	0	2	0
Through	0	0	0	1
Right	0	0	0	0

CONTROL

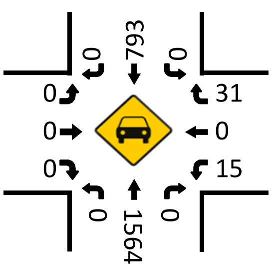
1-Way Stop (WB)

	AM	NOON	PM
TEV	2454	0	2466
PHF	0.96		0.94

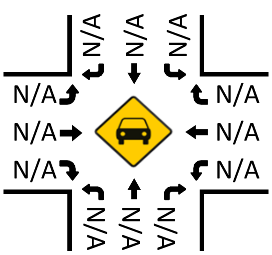
Redondo Ave — NORTHBOUND

	Departing	U-Turn	Left	Through	Right
		0	0	2	0
PM	1260	3	0	1142	0
NOON	0	0	0	0	0
AM	835	0	0	1585	0

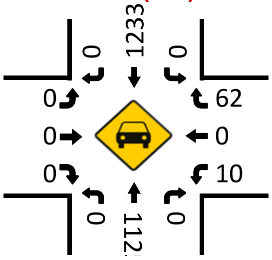
Cars (AM)



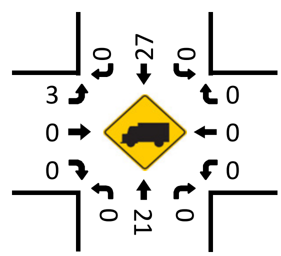
Cars (NOON)



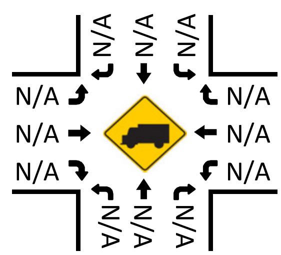
Cars (PM)



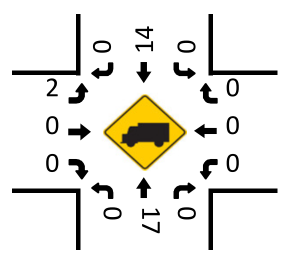
HT (AM)



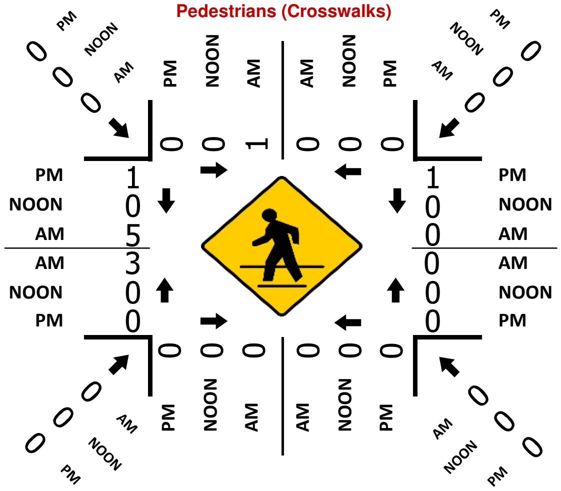
HT (NOON)



HT (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Redondo Ave & Industry Dr

Peak Hour Turning Movement Count

ID: 17-5595-005
City: Long Beach

Day: Wednesday
Date: 09/13/2017

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

SOUTHBOUND (Redondo Ave)

AM	56	705	41	0	1619	AM
NOON	0	0	0	0	0	NOON
PM	47	1197	19	0	1159	PM

EASTBOUND (Industry Dr)

AM	NOON	PM	
100	0	79	
0	0	0	0
20	0	31	0
0	0	0	1
25	0	54	0

WESTBOUND (Industry Dr)

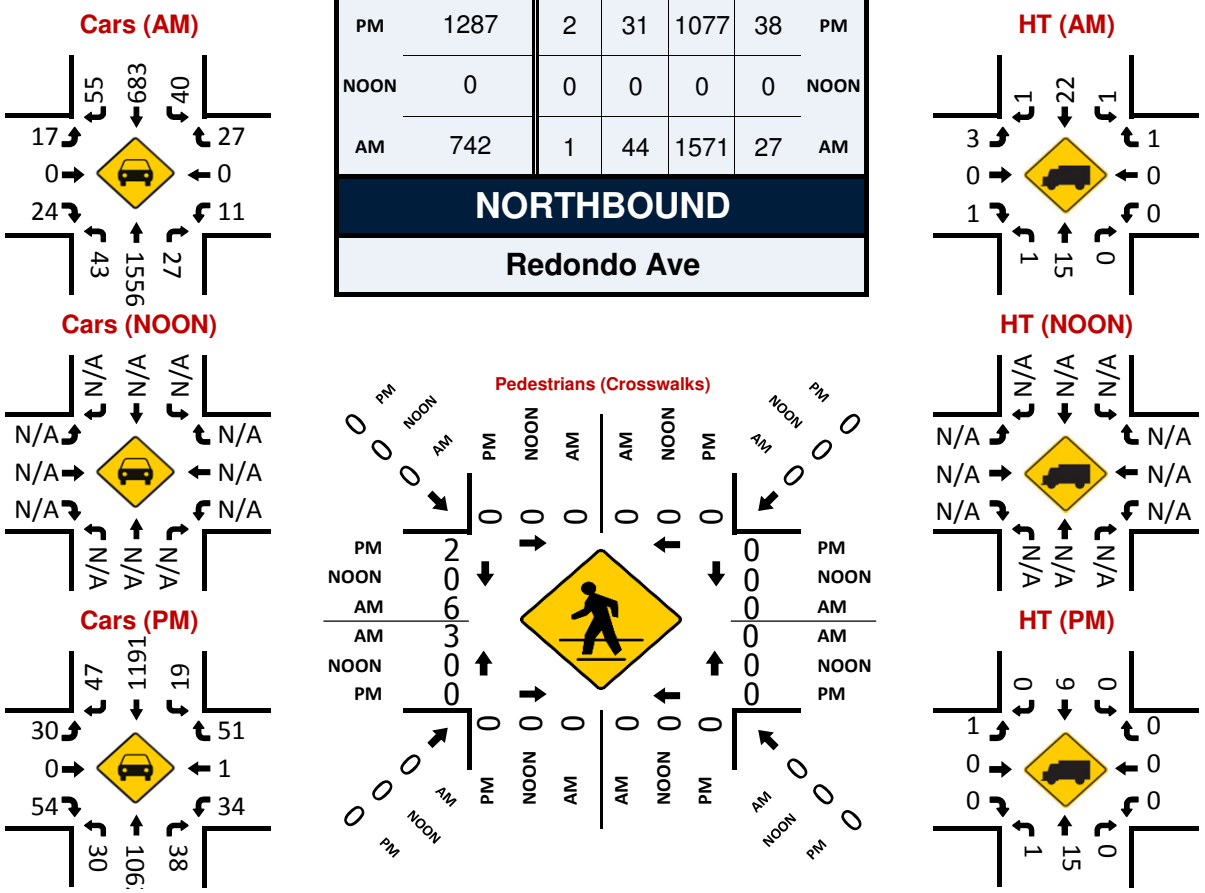
	PM	NOON	AM
1	51	0	28
0	1	0	0
1	34	0	11
0	0	0	0
	57	0	68

NORTHBOUND (Redondo Ave)

PM	1287	2	31	1077	38	PM
NOON	0	0	0	0	0	NOON
AM	742	1	44	1571	27	AM

0	2	0	0
0	1	2	0

CONTROL			
2-Way Stop (EB/WB)			
TEV	2529	0	2582
	AM	NOON	PM
PHF	0.97		0.91



Prepared by National Data & Surveying Services

Redondo Ave & Hill St

Peak Hour Turning Movement Count

ID: 17-5595-006
City: Long Beach

Day: Wednesday
Date: 09/13/2017

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

SOUTHBOUND (Redondo Ave)

AM	74	664	0	0	1645	AM
NOON	0	0	0	0	0	NOON
PM	114	1172	0	0	1152	PM
	0	2	0	0		

EASTBOUND (Hill St)

AM	NOON	PM	
213	0	241	
0	0	0	0
240	0	194	1
0	0	0	0
149	0	228	1

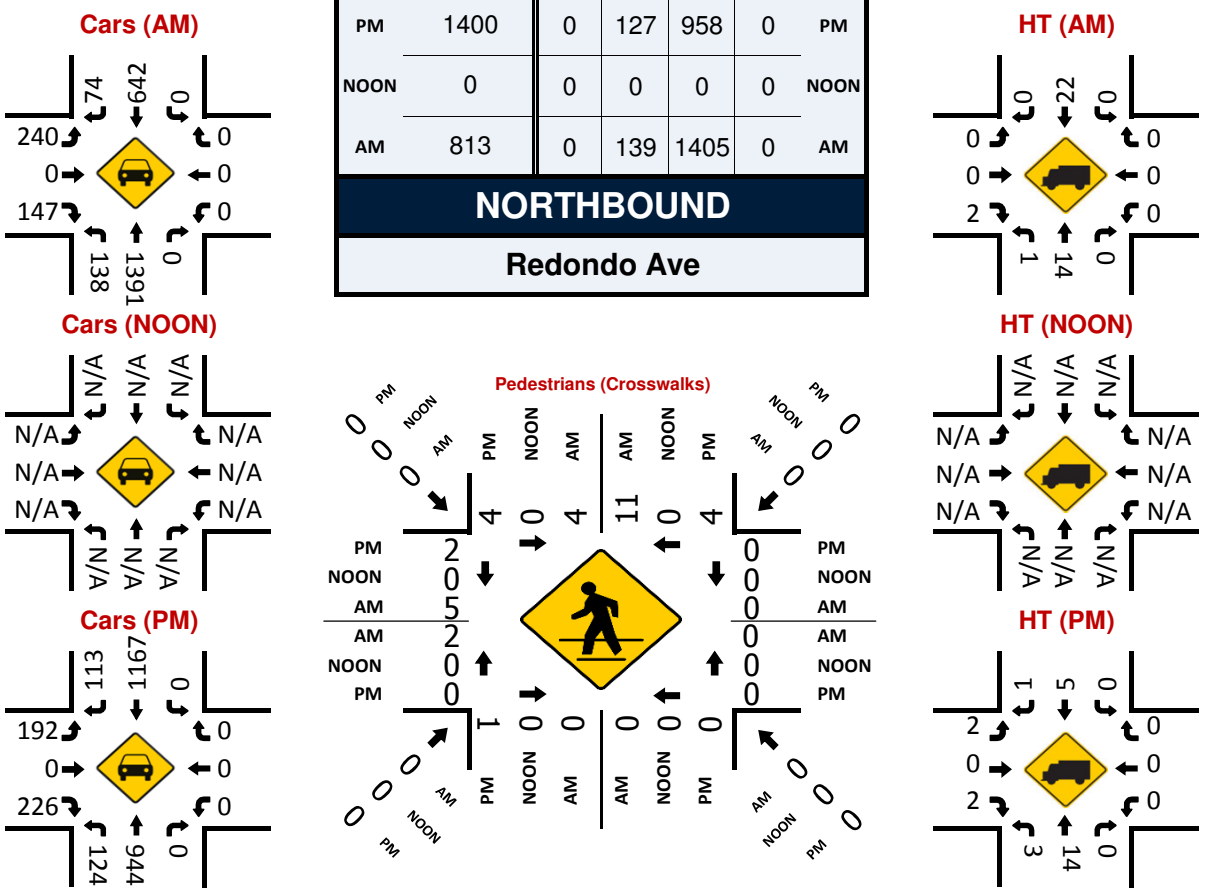
WESTBOUND (Hill St)

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

NORTHBOUND (Redondo Ave)

PM	1400	0	127	958	0	PM
NOON	0	0	0	0	0	NOON
AM	813	0	139	1405	0	AM
		0	1	2	0	

CONTROL			
Signalized			
TEV	2671	0	2793
	AM	NOON	PM
PHF	0.96		0.94



Prepared by National Data & Surveying Services

Redondo Ave & Stearns St

Peak Hour Turning Movement Count

ID: 17-5595-007
City: Long Beach

Day: Wednesday
Date: 09/13/2017

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

Redondo Ave — SOUTHBOUND

AM	0	698	118	0	1530	AM
NOON	0	0	0	0	0	NOON
PM	0	1164	233	0	1078	PM

Stearns St — EASTBOUND

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

Stearns St — WESTBOUND

PM	NOON	AM	
154	0	178	1.5
0	0	0	0
207	0	216	1.5
0	0	0	0
430	0	269	
PM	NOON	AM	

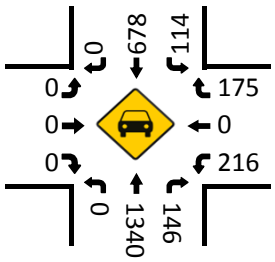
Redondo Ave — NORTHBOUND

PM	1371	0	0	924	197	PM
NOON	0	0	0	0	0	NOON
AM	914	0	0	1352	151	AM

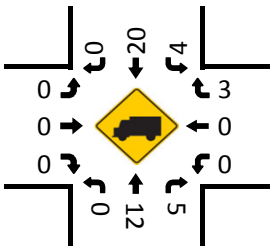
Turning movements (red): 0 2 1 0 (southbound); 1.5 0 1.5 0 (westbound); 0 0 2 0 (northbound); 0 0 0 0 (eastbound).

CONTROL			
Signalized			
TEV	2713	0	2879
	AM	NOON	PM
PHF	0.98		0.95

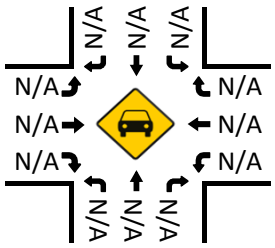
Cars (AM)



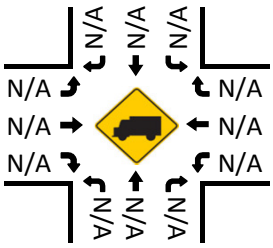
HT (AM)



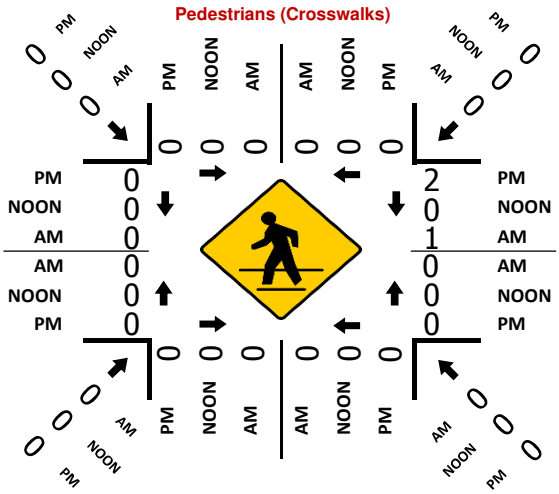
Cars (NOON)



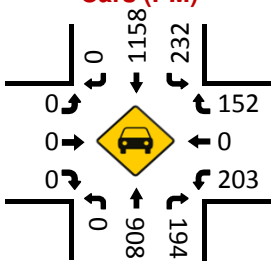
HT (NOON)



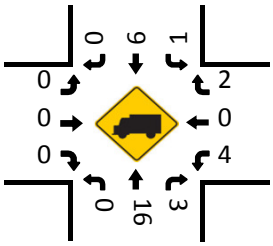
Pedestrians (Crosswalks)



Cars (PM)



HT (PM)



Prepared by National Data & Surveying Services

Redondo Ave & Pacific Coast Hwy (SR-1)

Peak Hour Turning Movement Count

ID: 17-5595-008
City: Long Beach

Day: Wednesday
Date: 09/13/2017

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

Redondo Ave — SOUTHBOUND

AM	150	426	88	0	1241	AM
NOON	0	0	0	0	0	NOON
PM	196	813	169	0	958	PM
	1	2	1	0		

Pacific Coast Hwy (SR-1) — EASTBOUND

AM	NOON	PM	
1596	0	1517	
0	0	0	0
221	0	211	1
1032	0	1246	3
10	0	17	0
AM	NOON	PM	

CONTROL

Signalized

	AM	NOON	PM
TEV	4859	0	5294
PHF	0.97		0.99

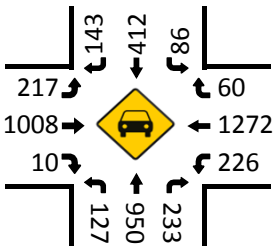
Pacific Coast Hwy (SR-1) — WESTBOUND

	PM	NOON	AM
0	42	0	62
3	1182	0	1318
1	284	0	231
0	0	0	0
	1705	0	1355
	PM	NOON	AM

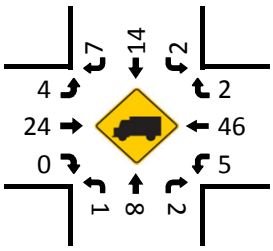
Redondo Ave — NORTHBOUND

	0	1	2	0		
PM	1114	0	139	705	290	PM
NOON	0	0	0	0	0	NOON
AM	667	0	128	958	235	AM

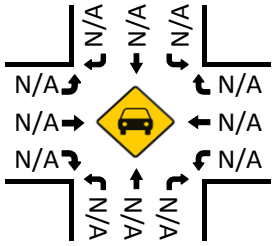
Cars (AM)



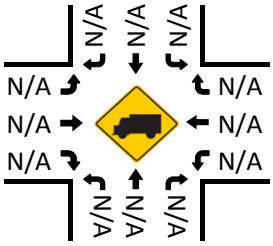
HT (AM)



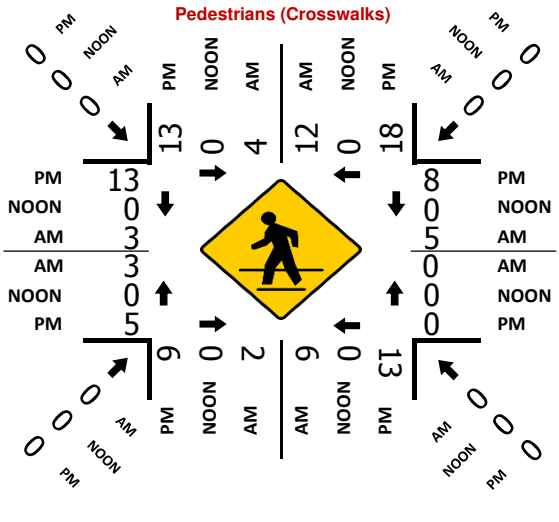
Cars (NOON)



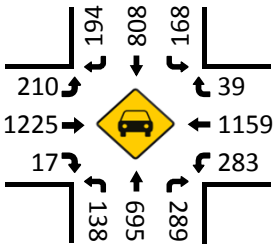
HT (NOON)



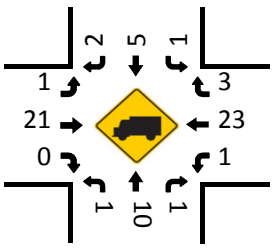
Pedestrians (Crosswalks)



Cars (PM)



HT (PM)



Prepared by National Data & Surveying Services

Grand Ave & Willow St

Peak Hour Turning Movement Count

ID: 17-5595-009
City: Long Beach

Day: Wednesday
Date: 09/13/2017

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

SOUTHBOUND (Grand Ave)

AM	40	4	28	0	185	AM
NOON	0	0	0	0	0	NOON
PM	58	3	94	0	117	PM
	0	1	1	0		

EASTBOUND (Willow St)

AM	NOON	PM	
1903	0	1361	
3	0	22	0
68	0	52	1
1293	0	2093	3
71	0	26	0
AM	NOON	PM	

WESTBOUND (Willow St)

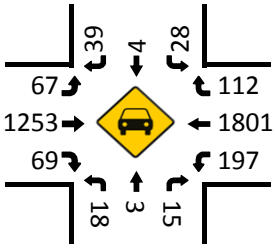
PM	NOON	AM	
60	0	114	1
1237	0	1839	3
58	0	201	2
37	0	12	0
2358	0	1353	
PM	NOON	AM	

NORTHBOUND (Grand Ave)

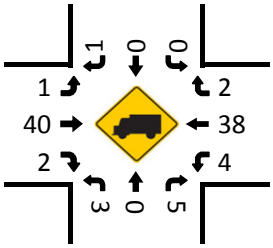
PM	87	0	44	5	134	PM
NOON	0	0	0	0	0	NOON
AM	276	0	21	3	20	AM
		0	1	0.5	1.5	

CONTROL			
Signalized			
TEV	3717 AM	0 NOON	3923 PM
PHF	0.94		0.95

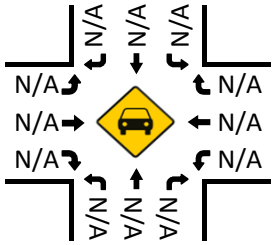
Cars (AM)



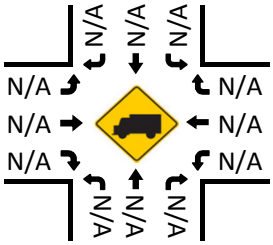
HT (AM)



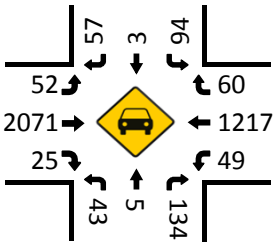
Cars (NOON)



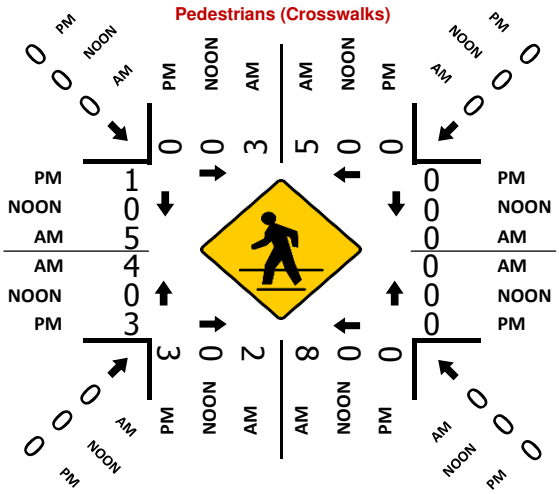
HT (NOON)



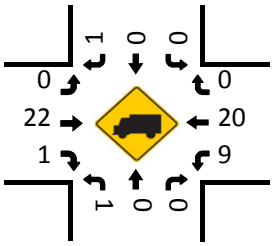
Cars (PM)



Pedestrians (Crosswalks)



HT (PM)



Prepared by National Data & Surveying Services

Grand Ave & Burnett St

Peak Hour Turning Movement Count

ID: 17-5595-010
City: Long Beach

Day: Wednesday
Date: 09/13/2017

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

SOUTHBOUND (Grand Ave)

AM	67	43	0	2	48	AM
NOON	0	0	0	0	0	NOON
PM	100	17	0	1	51	PM
	1	1	0	0		

EASTBOUND (Burnett St)

AM	NOON	PM	
74	0	129	
0	0	0	0
41	0	21	1
0	0	0	0
24	0	7	1
AM	NOON	PM	

WESTBOUND (Burnett St)

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

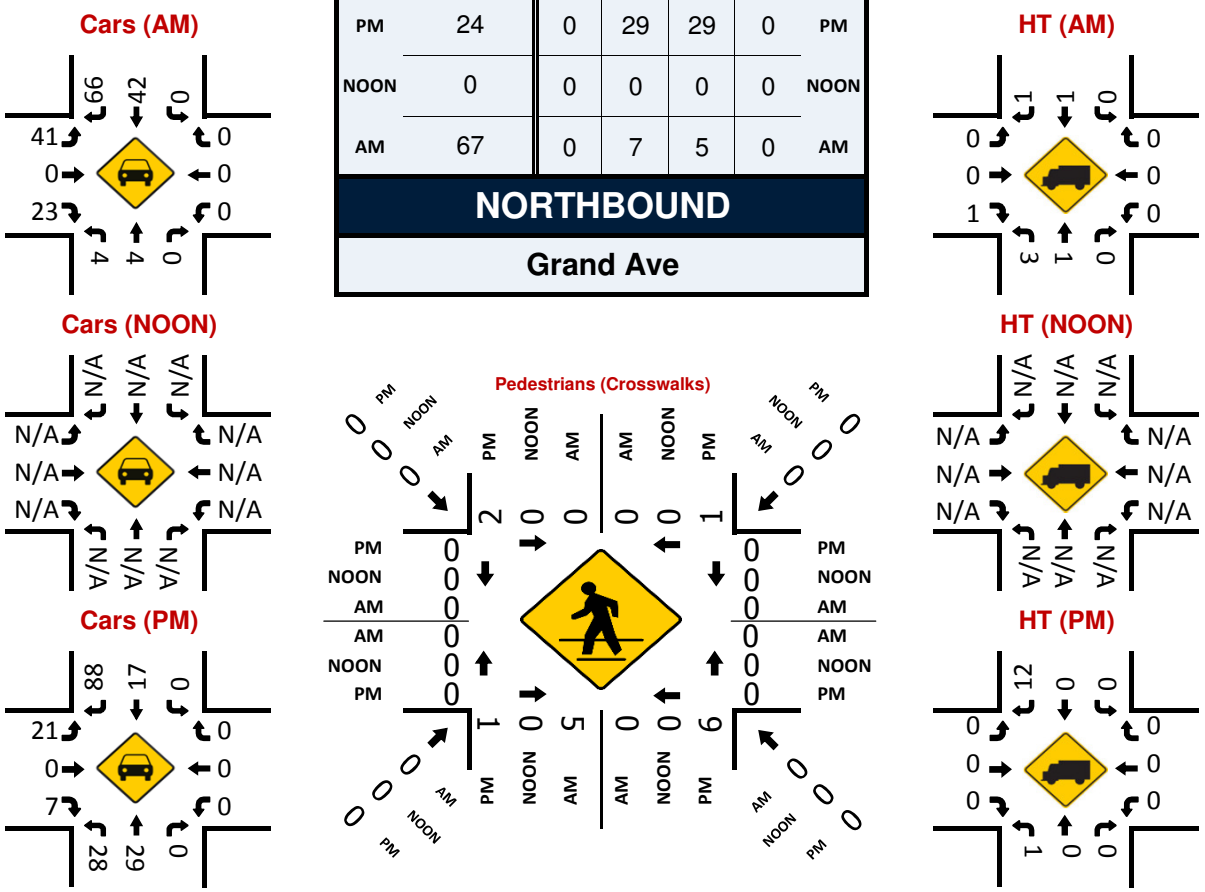
NORTHBOUND (Grand Ave)

PM	24	0	29	29	0	PM
NOON	0	0	0	0	0	NOON
AM	67	0	7	5	0	AM
		0	0	1	0	

CONTROL

1-Way Stop (EB)

TEV	189	0	204
	AM	NOON	PM
PHF	0.89		0.67



Prepared by National Data & Surveying Services

Lakewood Blvd (SR-19) & Willow St

Peak Hour Turning Movement Count

ID: 17-5595-011
City: Long Beach

Day: Wednesday
Date: 09/13/2017

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

SOUTHBOUND (Lakewood Blvd (SR-19))

AM	501	1239	89	16	2321	AM
NOON	0	0	0	0	0	NOON
PM	278	1309	111	30	1900	PM
	0	3	2	0		

EASTBOUND (Willow St)

AM	NOON	PM		
2227	0	1447		
23	0	24	0	
176	0	293	2	
1097	0	1725	3	
134	0	295	1	

WESTBOUND (Willow St)

	PM	NOON	AM
1.5	535	0	793
2.5	947	0	1411
2	172	0	91
0	16	0	7
	2013	0	1400

NORTHBOUND (Lakewood Blvd (SR-19))

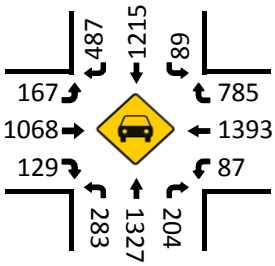
PM	1776	0	198	1042	161	PM
NOON	0	0	0	0	0	NOON
AM	1464	0	292	1336	207	AM
		0	2	4	0	

CONTROL

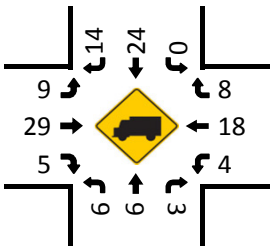
Signalized

TEV	7412	0	7136
	AM	NOON	PM
PHF	0.93		0.97

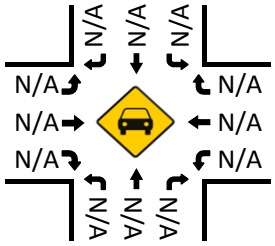
Cars (AM)



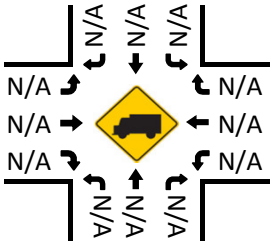
HT (AM)



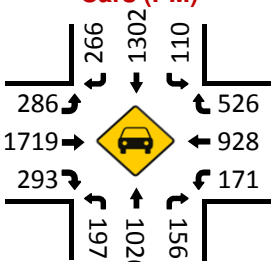
Cars (NOON)



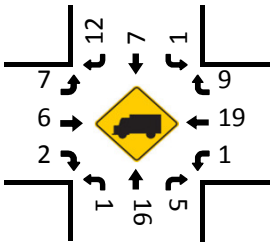
HT (NOON)



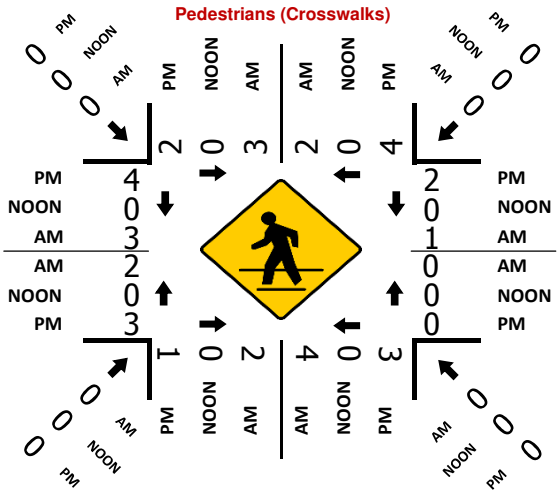
Cars (PM)



HT (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Temple Ave & Spring St

Peak Hour Turning Movement Count

ID: 17-5595-012
City: Long Beach

Day: Wednesday
Date: 09/13/2017

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

Temple Ave — SOUTHBOUND

	Right	Thru	Left	U-Turn	Departing
AM	4	2	3	0	36
NOON	0	0	0	0	0
PM	11	6	29	0	12
Lanes	0.5	1	0.5	0	

Spring St — EASTBOUND

	AM	NOON	PM	Lanes
Departing	2064	0	1881	
U-Turn	17	0	15	0
Left	16	0	8	1
Thru	1075	0	1329	3
Right	240	0	269	0

Spring St — WESTBOUND

	PM	NOON	AM	Lanes
Right	3	0	3	0
Thru	1467	0	1650	3
Left	65	0	112	1
U-Turn	1	0	1	0
Departing	1481	0	1177	

Temple Ave — NORTHBOUND

	Departing	U-Turn	Left	Thru	Right
Lanes		0	2	0.5	0.5
PM	346	6	388	1	122
NOON	0	0	0	0	0
AM	357	3	393	17	98

CONTROL

Signalized

	AM	NOON	PM
TEV	3634	0	3720
PHF	0.89		0.86

Cars and HT

	Cars (AM)	Cars (NOON)	Cars (PM)	HT (AM)	HT (NOON)	HT (PM)
SB Right	4	N/A	11	0	N/A	0
SB Thru	2	N/A	6	0	N/A	0
SB Left	3	N/A	29	0	N/A	0
EB Left	16	N/A	8	0	N/A	0
EB Thru	1048	N/A	1308	27	N/A	21
EB Right	233	N/A	264	7	N/A	5
WB Right	3	N/A	3	0	N/A	0
WB Thru	1633	N/A	1442	17	N/A	25
WB Left	107	N/A	65	5	N/A	0
NB Left	370	N/A	378	23	N/A	10
NB Thru	16	N/A	1	1	N/A	0
NB Right	95	N/A	116	3	N/A	6

Pedestrians (Crosswalks)

Crosswalk	AM	NOON	PM
North	0	0	0
South	0	0	1
East	0	0	0
West	0	0	0
Diagonals	0	0	0

Prepared by National Data & Surveying Services

Temple Ave & I-405 NB Off-ramps

Peak Hour Turning Movement Count

ID: 17-5595-013
City: Long Beach

Day: Wednesday
Date: 09/13/2017

PEAK HOURS	COUNT PERIODS
07:45 AM - 08:45 AM	07:00 AM - 09:00 AM
NONE	NONE
04:15 PM - 05:15 PM	04:00 PM - 06:00 PM

SOUTHBOUND (Temple Ave)

AM	0	346	0	0	504	AM
NOON	0	0	0	0	0	NOON
PM	0	295	0	0	595	PM

EASTBOUND (I-405 NB Off-ramps)

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

WESTBOUND (I-405 NB Off-ramps)

	PM	NOON	AM
1	136	0	127
0	0	0	0
1	346	0	233
0	0	0	0
	0	0	0
	PM	NOON	AM

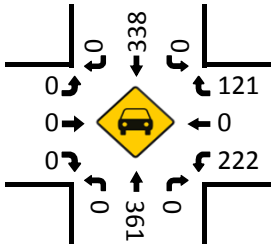
NORTHBOUND (Temple Ave)

PM	641	0	0	459	0	PM
NOON	0	0	0	0	0	NOON
AM	579	0	0	377	0	AM

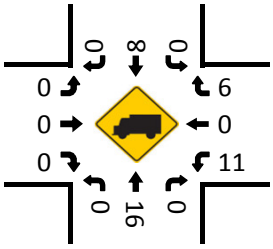
Turning movements (red): 0 2 0 0 (Southbound); 0 0 2 0 (Northbound)

CONTROL			
Signalized			
TEV	1083	0	1236
	AM	NOON	PM
PHF	0.89		0.86

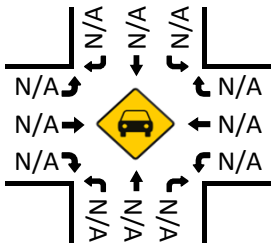
Cars (AM)



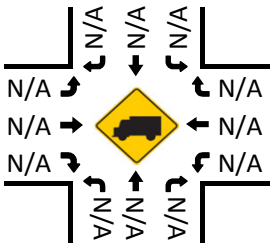
HT (AM)



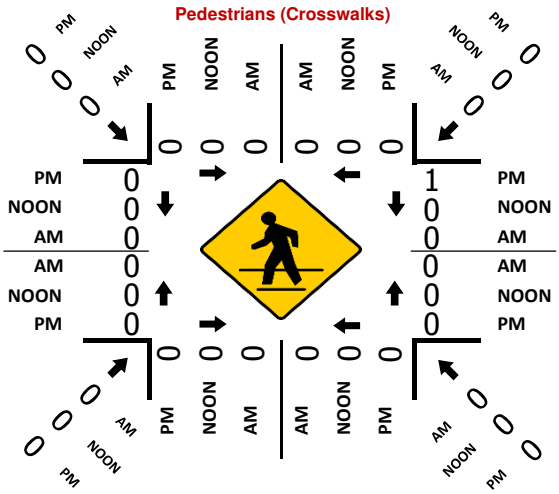
Cars (NOON)



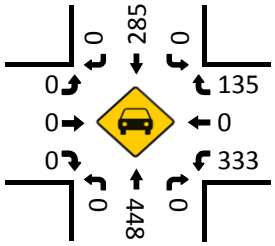
HT (NOON)



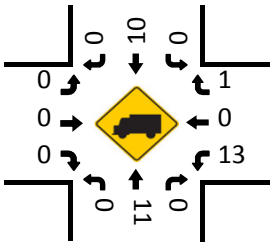
Pedestrians (Crosswalks)



Cars (PM)



HT (PM)



Prepared by National Data & Surveying Services

Temple Ave & Willow St

Peak Hour Turning Movement Count

ID: 17-5595-014
City: Long Beach

Day: Wednesday
Date: 09/13/2017

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

Temple Ave — SOUTHBOUND

AM	138	192	61	0	490	AM
NOON	0	0	0	0	0	NOON
PM	238	417	149	0	328	PM
	0	2	1	0		

Willow St — EASTBOUND

AM	NOON	PM	
1672	0	1567	
3	0	1	0
61	0	44	1
1165	0	1589	3
81	0	141	0
AM	NOON	PM	

Willow St — WESTBOUND

PM	NOON	AM	
71	0	81	0
1271	0	1439	3
38	0	23	1
3	0	6	0
1787	0	1304	
PM	NOON	AM	

CONTROL

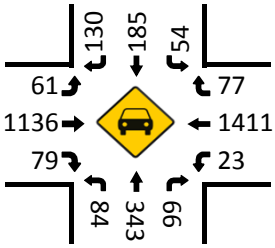
Signalized

TEV	3762	0	4278
	AM	NOON	PM
PHF	0.97		0.94

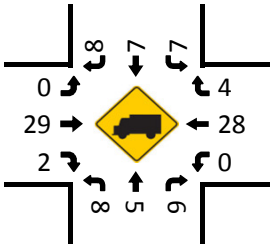
Temple Ave — NORTHBOUND

PM	596	0	57	213	46	PM
NOON	0	0	0	0	0	NOON
AM	296	0	92	348	72	AM
		0	1	2	0	

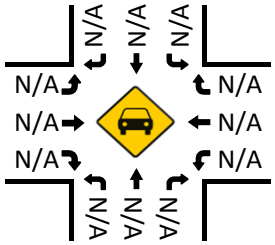
Cars (AM)



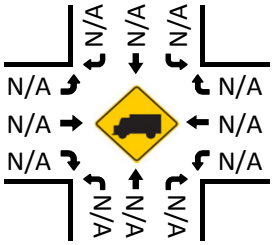
HT (AM)



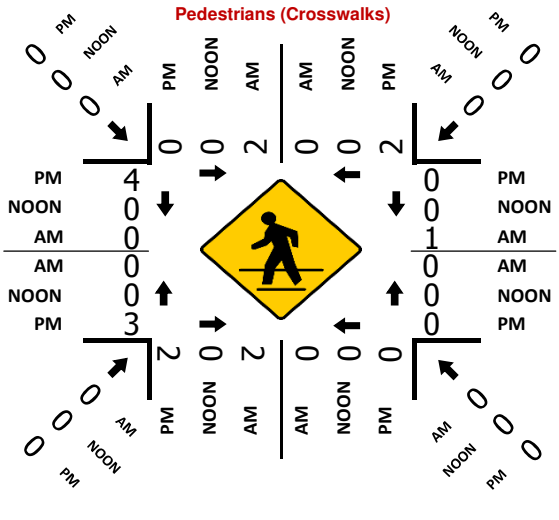
Cars (NOON)



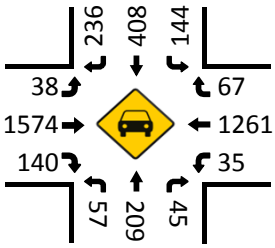
HT (NOON)



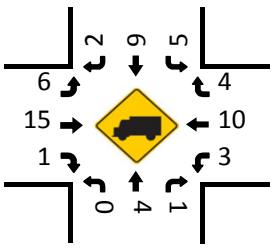
Pedestrians (Crosswalks)



Cars (PM)



HT (PM)



Prepared by National Data & Surveying Services

Cherry Ave & Willow St

Peak Hour Turning Movement Count

ID: 17-5595-015
City: Long Beach

Day: Wednesday
Date: 09/13/2017

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

SOUTHBOUND (Cherry Ave)

AM	146	850	210	0	1374	AM
NOON	0	0	0	0	0	NOON
PM	195	904	288	0	1296	PM
	0	3	2	0		

EASTBOUND (Willow St)

AM	NOON	PM	
1422	0	1464	
0	0	0	0
204	0	227	2
947	0	1345	3
94	0	134	0

WESTBOUND (Willow St)

	PM	NOON	AM
0	218	0	131
3	1139	0	1143
2	271	0	219
0	3	0	0
	1849	0	1359

NORTHBOUND (Cherry Ave)

PM	1335	26	130	851	213	PM
NOON	0	0	0	0	0	NOON
AM	1186	23	133	1039	202	AM
		0	1	3	1	

CONTROL			
Signalized			
TEV	5341	0	5944
	AM	NOON	PM
PHF	0.94		0.97

Cars (AM)

202	145	823	204
926			126
89			1109
	131	1023	199	210

HT (AM)

2	1	27	9
21			5
5			34
	2	16	3	9

Cars (NOON)

N/A	N/A	N/A	N/A
N/A			N/A
N/A			N/A
	N/A	N/A	N/A	N/A

HT (NOON)

N/A	N/A	N/A	N/A
N/A			N/A
N/A			N/A
	N/A	N/A	N/A	N/A

Cars (PM)

225	191	668	287
1333			218
134			1131
	130	833	207	267

HT (PM)

2	4	5	1
12			0
0			8
	0	18	6	4

Pedestrians (Crosswalks)

PM	2	0	3	2	0	1	5	0	8	3	0	3
NOON	0	0	0	0	0	0	0	0	0	0	0	0
AM	3	0	1	0	0	0	0	0	0	0	0	0
	AM	NOON	PM	AM	NOON	PM	AM	NOON	PM	AM	NOON	PM
	0	0	0	0	0	0	0	0	0	0	0	0
	7	0	3	0	0	0	3	0	3	0	0	0
	PM	NOON	AM	AM	NOON	PM	AM	NOON	PM	AM	NOON	PM

Prepared by National Data & Surveying Services

I-405 SB Off-ramps & Spring St

Peak Hour Turning Movement Count

ID: 17-5595-016
City: Long Beach

Day: Wednesday
Date: 09/13/2017

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

I-405 SB Off-ramps — SOUTHBOUND

AM	255	2	683	0	0	AM
NOON	0	0	0	0	0	NOON
PM	98	3	423	0	0	PM
	1	0.5	1.5	0		

Spring St — EASTBOUND

AM	NOON	PM	
1747	0	1365	
0	0	0	0
0	0	0	0
1087	0	1298	2
4	0	10	0

Spring St — WESTBOUND

	PM	NOON	AM
0	0	0	0
2	1267	0	1492
0	0	0	0
0	0	0	0
	1736	0	1775

CONTROL

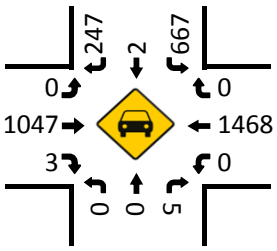
Signalized

TEV	3528	0	3114
	AM	NOON	PM
PHF	0.90		0.91

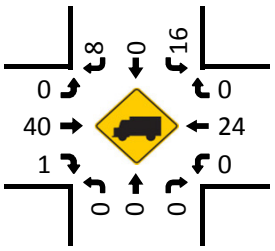
I-405 SB Off-ramps — NORTHBOUND

PM	13	0	0	0	15	PM
NOON	0	0	0	0	0	NOON
AM	6	0	0	0	5	AM
	0	0	1	0		

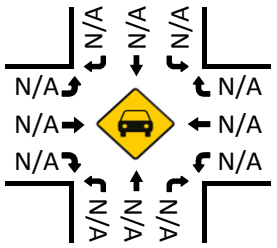
Cars (AM)



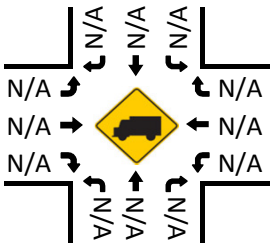
HT (AM)



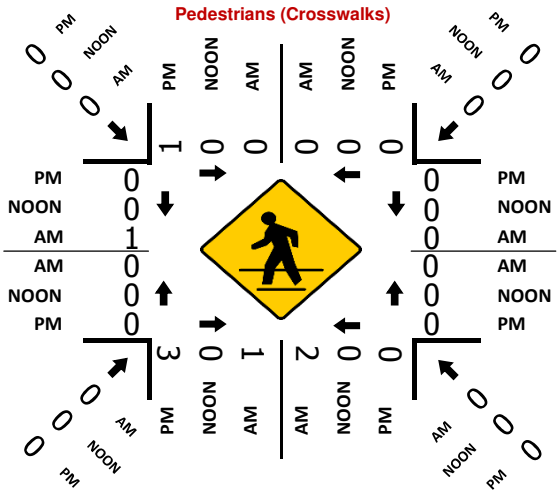
Cars (NOON)



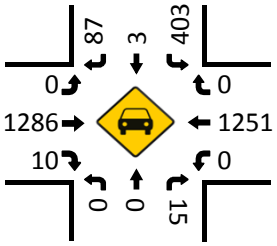
HT (NOON)



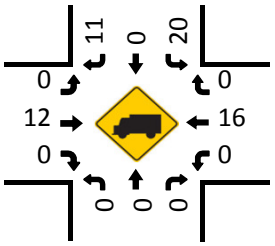
Pedestrians (Crosswalks)



Cars (PM)



HT (PM)



Appendix B

LOS Worksheets – Existing Conditions

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Intersection Level Of Service Report

Intersection 1: Redondo Avenue & Spring Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.749

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	1	0	0	2	0	0
Pocket Length [ft]	250.00	100.00	100.00	100.00	100.00	100.00	120.00	100.00	100.00	220.00	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]	535	2	286	5	2	1	3	729	338	314	1296	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 [%]	1.00	0.00	1.00	0.00	0.00	0.00	0.00	3.00	2.00	3.00	1.00	10.00
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]	535	2	286	5	2	1	3	729	338	314	1296	10
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	147	1	79	1	1	0	1	200	93	86	356	3
Total Analysis Volume [veh/h]	588	2	314	5	2	1	3	801	371	345	1424	11
Pedestrian Volume [ped/h]	0			1			0			0		
Bicycle Volume [bicycles/h]	1			0			1			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.18	0.10	0.10	0.00	0.00	0.00	0.00	0.24	0.24	0.11	0.30	0.30
Intersection LOS	C											
Intersection V/C	0.749											

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Intersection Level Of Service Report
Intersection 2: Redondo Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.806

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	0	1	0	1	2	0	1
Pocket Length [ft]	175.00	100.00	150.00	145.00	100.00	100.00	190.00	100.00	190.00	160.00	100.00	160.00
Speed [mph]	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]	254	929	465	108	358	48	118	1020	159	196	1322	275
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	1.00	11.00	2.00	4.00	2.00	3.00	7.00	5.00	2.00	3.00
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]	254	929	465	108	358	48	118	1020	159	196	1322	275
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	68	247	124	29	95	13	31	271	42	52	352	73
Total Analysis Volume [veh/h]	270	988	495	115	381	51	126	1085	169	209	1406	293
Pedestrian Volume [ped/h]	5			3			0			2		
Bicycle Volume [bicycles/h]	3			0			1			0		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.21	0.24	0.04	0.09	0.09	0.08	0.23	0.11	0.07	0.29	0.18
Intersection LOS	D											
Intersection V/C	0.806											

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Intersection Level Of Service Report
Intersection 3: Redondo Avenue & Burnett Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.689

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1
Pocket Length [ft]	100.00	100.00	120.00	100.00	100.00	140.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	1524	84	31	787	29	23
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	0.00	4.00	10.00	17.00
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]	1524	84	31	787	29	23
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	401	22	8	207	8	6
Total Analysis Volume [veh/h]	1604	88	33	828	31	24
Pedestrian Volume [ped/h]	0		6		0	
Bicycle Volume [bicycles/h]	4		0		0	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	3	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.53	0.53	0.02	0.26	0.02	0.02
Intersection LOS	B					
Intersection V/C	0.689					

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Intersection Level Of Service Report

Intersection 4: Redondo Avenue & Project Driveway

Control Type:	Two-way stop	Delay (sec / veh):	40.6
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.134

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	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	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	1585	0	0	820	15	31
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	0.00	0.00	3.00	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]	1585	0	0	820	15	31
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	413	0	0	214	4	8
Total Analysis Volume [veh/h]	1651	0	0	854	16	32
Pedestrian Volume [ped/h]	0		0		1	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.01	0.13	0.10
d_M, Delay for Movement [s/veh]	0.00	0.00	14.10	0.00	40.57	21.61
Movement LOS	A	A	B	A	E	C
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.88	0.88
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	22.02	22.02
d_A, Approach Delay [s/veh]	0.00		0.00		27.93	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	0.53					
Intersection LOS	E					

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Intersection Level Of Service Report

Intersection 5: Redondo Avenue & Industry Drive

Control Type:	Two-way stop	Delay (sec / veh):	70.3
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.167

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	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	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	150.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	45	1571	27	41	705	56	20	0	25	11	0	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	0.00	2.00	3.00	2.00	15.00	0.00	4.00	0.00	2.00	4.00
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]	45	1571	27	41	705	56	20	0	25	11	0	28
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	1.0000	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	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	405	7	11	182	14	5	0	6	3	0	7
Total Analysis Volume [veh/h]	46	1620	28	42	727	58	21	0	26	11	0	29
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			Yes	Yes
Number of Storage Spaces in Median	0	0	1	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.02	0.00	0.11	0.01	0.00	0.19	0.00	0.04	0.17	0.00	0.09
d_M, Delay for Movement [s/veh]	9.60	0.00	0.00	15.40	0.00	0.00	43.26	67.44	16.42	70.32	0.00	17.72
Movement LOS	A	A	A	C	A	A	E	F	C	F		C
95th-Percentile Queue Length [veh]	0.18	0.00	0.00	0.36	0.00	0.00	0.88	0.88	0.88	0.56	0.00	0.30
95th-Percentile Queue Length [ft]	4.40	0.00	0.00	9.02	0.00	0.00	22.00	22.00	22.00	13.91	0.00	7.62
d_A, Approach Delay [s/veh]	0.26			0.78			28.41			32.18		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	1.42											
Intersection LOS	F											

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Intersection Level Of Service Report
Intersection 6: Redondo Avenue & Hill Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.734

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	70.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	139	1405	664	74	240	149
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	1.00	3.00	0.00	0.00	1.00
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]	139	1405	664	74	240	149
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	366	173	19	63	39
Total Analysis Volume [veh/h]	145	1464	692	77	250	155
Pedestrian Volume [ped/h]	0		0		7	
Bicycle Volume [bicycles/h]	5		0		1	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	2	6	0	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.46	0.24	0.24	0.16	0.10
Intersection LOS	C					
Intersection V/C	0.734					

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Intersection Level Of Service Report
Intersection 7: Redondo Avenue & Stearns Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.758

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	1	1
Pocket Length [ft]	100.00	100.00	110.00	100.00	70.00	70.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	1352	151	118	698	216	178
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	3.00	3.00	3.00	0.00	2.00
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]	1352	151	118	698	216	178
Peak Hour Factor	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	345	39	30	178	55	45
Total Analysis Volume [veh/h]	1380	154	120	712	220	182
Pedestrian Volume [ped/h]	0		0		1	
Bicycle Volume [bicycles/h]	3		2		2	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	3	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.48	0.48	0.08	0.22	0.07	0.08
Intersection LOS	C					
Intersection V/C	0.758					

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Intersection Level Of Service Report

Intersection 8: Redondo Avenue & Pacific Coast Highway

Control Type:	Signalized	Delay (sec / veh):	56.3
Analysis Method:	HCM 2010	Level Of Service:	E
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	0	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	200.00	100.00	100.00	150.00	100.00	65.00	160.00	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]	128	958	235	88	426	150	221	1032	10	231	1318	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 [%]	1.00	1.00	1.00	2.00	3.00	5.00	2.00	2.00	0.00	2.00	3.00	3.00
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]	128	958	235	88	426	150	221	1032	10	231	1318	62
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	247	61	23	110	39	57	266	3	60	340	16
Total Analysis Volume [veh/h]	132	988	242	91	439	155	228	1064	10	238	1359	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
Pedestrian Volume [ped/h]	5			6			8			16		
Bicycle Volume [bicycles/h]	3			1			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	47.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	7	4	0	3	8	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	10	0	7	10	0	7	8	0	7	8	0
Maximum Green [s]	20	50	0	20	50	0	20	33	0	20	33	0
Amber [s]	4.0	4.1	0.0	4.0	4.1	0.0	4.0	4.4	0.0	4.0	4.4	0.0
All red [s]	1.0	1.4	0.0	1.0	1.4	0.0	1.0	1.4	0.0	1.0	1.4	0.0
Split [s]	25	42	0	25	42	0	17	36	0	17	36	0
Vehicle Extension [s]	2.5	3.5	0.0	2.5	3.5	0.0	2.5	3.5	0.0	2.5	3.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	6	0
Pedestrian Clearance [s]	0	16	0	0	16	0	0	20	0	0	20	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]	3.0	3.5	0.0	3.0	3.5	0.0	3.0	3.8	0.0	3.0	3.8	0.0
Minimum Recall	No	Yes		No	Yes		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]	5.0	5.0	0.0	5.0	5.0	0.0	5.0	5.0	0.0	5.0	5.0	0.0
Detector Length [ft]	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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]	126	126	126	126	126	126	126	126	126	126	126	126
L, Total Lost Time per Cycle [s]	5.50	5.50	5.50	5.50	5.50	5.50	5.00	5.80	5.80	5.00	5.80	5.80
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	3.50	3.50	0.00	3.50	3.50	3.00	3.80	3.80	3.00	3.80	3.80
g_i, Effective Green Time [s]	59	47	47	59	46	46	18	32	32	19	33	33
g / C, Green / Cycle	0.47	0.37	0.37	0.47	0.37	0.37	0.14	0.26	0.26	0.15	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.12	0.34	0.34	0.14	0.12	0.10	0.13	0.20	0.20	0.13	0.27	0.27
s, saturation flow rate [veh/h]	1107	1881	1735	672	3512	1509	1774	3547	1854	1774	3512	1801
c, Capacity [veh/h]	515	702	647	249	1285	552	255	907	474	264	917	470
d1, Uniform Delay [s]	20.03	37.46	37.90	27.46	29.04	28.32	53.20	43.72	43.72	52.89	46.72	46.72
k, delay calibration	0.13	0.35	0.36	0.29	0.13	0.13	0.25	0.13	0.27	0.28	0.13	0.44
I, Upstream Filtering Factor	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	12.77	16.37	2.36	0.19	0.33	21.10	1.78	6.64	22.87	22.23	46.17
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

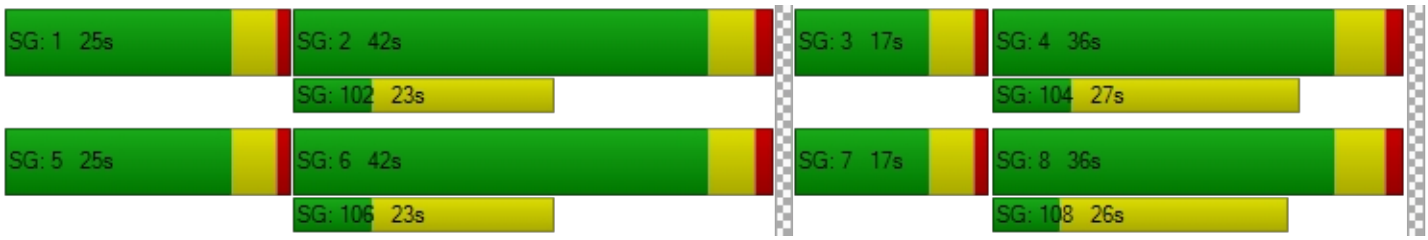
X, volume / capacity	0.26	0.90	0.92	0.37	0.34	0.28	0.89	0.78	0.78	0.90	1.03	1.03
d, Delay for Lane Group [s/veh]	20.34	50.23	54.27	29.81	29.23	28.65	74.30	45.50	50.36	75.76	68.95	92.89
Lane Group LOS	C	D	D	C	C	C	E	D	D	E	F	F
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	2.30	20.72	20.34	1.68	4.89	3.39	8.60	10.44	11.55	9.09	17.11	20.66
50th-Percentile Queue Length [ft]	57.55	517.95	508.49	42.06	122.24	84.87	214.93	260.99	288.86	227.28	427.63	516.58
95th-Percentile Queue Length [veh]	4.14	28.18	27.74	3.03	8.52	6.11	13.41	15.74	17.13	14.04	24.26	28.59
95th-Percentile Queue Length [ft]	103.60	704.57	693.39	75.72	212.91	152.77	335.15	393.46	428.23	350.90	606.52	714.87

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	20.34	51.68	54.27	29.81	29.23	28.65	74.30	47.14	50.36	75.76	76.33	92.89
Movement LOS	C	D	D	C	C	C	E	D	D	E	E	F
d_A, Approach Delay [s/veh]	49.10			29.18			51.92			76.88		
Approach LOS	D			C			D			E		
d_I, Intersection Delay [s/veh]	56.32											
Intersection LOS	E											
Intersection V/C	0.772											

Sequence

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



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Intersection Level Of Service Report

Intersection 9: Grand Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.648

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	0	1	0	0	1	0	0	2	0	1
Pocket Length [ft]	160.00	100.00	100.00	170.00	100.00	100.00	120.00	100.00	100.00	170.00	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			No		

Volumes

Name												
Base Volume Input [veh/h]	21	3	20	28	4	40	71	1293	71	213	1839	114
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	14.00	0.00	25.00	0.00	0.00	3.00	1.00	3.00	3.00	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
Total Hourly Volume [veh/h]	21	3	20	28	4	40	71	1293	71	213	1839	114
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	1	5	7	1	11	19	344	19	57	489	30
Total Analysis Volume [veh/h]	22	3	21	30	4	43	76	1376	76	227	1956	121
Pedestrian Volume [ped/h]	0			9			10			0		
Bicycle Volume [bicycles/h]	0			0			2			1		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	15.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.02	0.03	0.03	0.05	0.30	0.30	0.07	0.41	0.08
Intersection LOS	B											
Intersection V/C	0.648											

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Intersection Level Of Service Report
Intersection 10: Grand Avenue & Burnett Street

Control Type:	Two-way stop	Delay (sec / veh):	9.1
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.050

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	90.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	7	5	43	67	41	24
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	43.00	20.00	2.00	1.00	0.00	4.00
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]	7	5	43	67	41	24
Peak Hour Factor	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	1	12	19	12	7
Total Analysis Volume [veh/h]	8	6	48	75	46	27
Pedestrian Volume [ped/h]	0		0		5	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
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	0.00	0.00	0.00	0.05	0.03
d_M, Delay for Movement [s/veh]	7.94	0.00	0.00	0.00	9.11	8.68
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.03	0.03	0.00	0.00	0.16	0.08
95th-Percentile Queue Length [ft]	0.86	0.86	0.00	0.00	3.93	2.07
d_A, Approach Delay [s/veh]	4.54		0.00		8.95	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.41					
Intersection LOS	A					

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Intersection Level Of Service Report

Intersection 11: Lakewood Boulevard & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.093

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	0	2	0	1	2	0	0
Pocket Length [ft]	175.00	100.00	100.00	140.00	100.00	100.00	175.00	100.00	300.00	150.00	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]	292	1336	207	105	1239	501	199	1097	134	98	1411	793
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	1.00	1.00	0.00	2.00	3.00	5.00	3.00	4.00	4.00	1.00	1.00
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]	292	1336	207	105	1239	501	199	1097	134	98	1411	793
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	78	359	56	28	333	135	53	295	36	26	379	213
Total Analysis Volume [veh/h]	314	1437	223	113	1332	539	214	1180	144	105	1517	853
Pedestrian Volume [ped/h]	6			5			5			1		
Bicycle Volume [bicycles/h]	0			0			0			2		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.26	0.26	0.04	0.39	0.39	0.07	0.25	0.00	0.03	0.37	0.37
Intersection LOS	F											
Intersection V/C	1.093											

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Intersection Level Of Service Report

Intersection 12: Temple Avenue & Spring Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.685

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	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	150.00	100.00	100.00	130.00	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			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	396	17	98	3	2	4	33	1075	240	113	1650	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	6.00	3.00	0.00	0.00	0.00	6.00	3.00	3.00	4.00	1.00	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]	396	17	98	3	2	4	33	1075	240	113	1650	3
Peak Hour Factor	1.0000	0.8900	0.8900	0.8900	0.8900	1.0000	1.0000	1.0000	1.0000	0.8900	1.0000	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	99	5	28	1	1	1	8	269	60	32	413	1
Total Analysis Volume [veh/h]	396	19	110	3	2	4	33	1075	240	127	1650	3
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			4			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.08	0.08	0.00	0.00	0.00	0.02	0.27	0.27	0.08	0.34	0.34
Intersection LOS	B											
Intersection V/C	0.685											

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Intersection Level Of Service Report
Intersection 13: Temple Avenue & I-405 Northbound Off-Ramps

Control Type:	Signalized	Delay (sec / veh):	8.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.304

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
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	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	377	0	0	346	233	127
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.00	2.00	2.00	2.00	5.00	5.00
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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	377	0	0	346	233	127
Peak Hour Factor	0.8900	1.0000	1.0000	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	106	0	0	97	65	36
Total Analysis Volume [veh/h]	424	0	0	389	262	143
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	2		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	4	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	10	0	0	10	10	0
Maximum Green [s]	30	0	0	30	25	0
Amber [s]	4.4	0.0	0.0	4.4	4.1	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	55	0	0	55	35	0
Vehicle Extension [s]	4.0	0.0	0.0	4.0	4.0	0.0
Walk [s]	7	0	0	0	0	0
Pedestrian Clearance [s]	10	0	0	0	0	0
Rest In Walk	Yes			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.4	0.0	0.0	3.4	3.1	0.0
Minimum Recall	Yes			Yes	No	
Maximum Recall	No			No	No	
Pedestrian Recall	Yes			No	No	
Detector Location [ft]	5.0	0.0	0.0	5.0	5.0	0.0
Detector Length [ft]	20.0	0.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	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	R
C, Cycle Length [s]	38	38	38	38
L, Total Lost Time per Cycle [s]	5.40	5.40	5.10	5.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.10	3.10
g_i, Effective Green Time [s]	17	17	10	10
g / C, Green / Cycle	0.45	0.45	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.14	0.12	0.17	0.10
s, saturation flow rate [veh/h]	3131	3192	1551	1384
c, Capacity [veh/h]	1422	1450	414	370
d1, Uniform Delay [s]	6.49	6.39	12.17	11.28
k, delay calibration	0.15	0.15	0.15	0.15
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.17	0.14	2.27	0.94
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.30	0.27	0.63	0.39
d, Delay for Lane Group [s/veh]	6.65	6.53	14.45	12.22
Lane Group LOS	A	A	B	B
Critical Lane Group	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	0.72	0.65	1.76	0.86
50th-Percentile Queue Length [ft]	17.97	16.20	44.12	21.43
95th-Percentile Queue Length [veh]	1.29	1.17	3.18	1.54
95th-Percentile Queue Length [ft]	32.34	29.15	79.42	38.58

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	6.65	0.00	0.00	6.53	14.45	12.22
Movement LOS	A			A	B	B
d_A, Approach Delay [s/veh]	6.65		6.53		13.66	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	8.94					
Intersection LOS	A					
Intersection V/C	0.304					

Sequence

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

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Intersection Level Of Service Report
Intersection 14: Temple Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.663

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	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	130.00	100.00	100.00	130.00	100.00	100.00	200.00	100.00	100.00	195.00	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]	92	348	72	61	192	138	64	1165	81	29	1439	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 [%]	9.00	1.00	8.00	11.00	4.00	6.00	0.00	2.00	2.00	0.00	2.00	5.00
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]	92	348	72	61	192	138	64	1165	81	29	1439	81
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	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	90	19	16	49	36	16	300	21	7	371	21
Total Analysis Volume [veh/h]	95	359	74	63	198	142	66	1201	84	30	1484	84
Pedestrian Volume [ped/h]	1			0			2			2		
Bicycle Volume [bicycles/h]	3			0			2			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.14	0.14	0.04	0.11	0.11	0.04	0.27	0.27	0.02	0.33	0.33
Intersection LOS	B											
Intersection V/C	0.663											

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Intersection Level Of Service Report
Intersection 15: Cherry Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.862

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	2	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	105.00	175.00	100.00	100.00	245.00	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]	156	1039	202	210	850	146	204	947	94	219	1143	131
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	2.00	1.00	3.00	3.00	1.00	1.00	2.00	5.00	4.00	3.00	4.00
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]	156	1039	202	210	850	146	204	947	94	219	1143	131
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	41	276	54	56	226	39	54	252	25	58	304	35
Total Analysis Volume [veh/h]	166	1105	215	223	904	155	217	1007	100	233	1216	139
Pedestrian Volume [ped/h]	3			5			11			3		
Bicycle Volume [bicycles/h]	1			0			2			1		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.23	0.06	0.07	0.22	0.22	0.07	0.23	0.23	0.07	0.28	0.28
Intersection LOS	D											
Intersection V/C	0.862											

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Intersection Level Of Service Report

Intersection 16: I-405 Southbound Off-Ramps & Spring Street

Control Type:	Signalized	Delay (sec / veh):	19.8
Analysis Method:	HCM 2010	Level Of Service:	B
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	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	180.00	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			Yes			Yes			No		

Volumes

Name												
Base Volume Input [veh/h]	0	0	0	683	2	255	0	1087	4	0	1492	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	0.00	3.00	2.00	4.00	25.00	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]	0	0	0	683	2	255	0	1087	4	0	1492	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	171	1	71	0	272	1	0	373	0
Total Analysis Volume [veh/h]	0	0	0	683	2	283	0	1087	4	0	1492	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			1			0			0		
Bicycle Volume [bicycles/h]	0			0			3			1		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	15.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	0	0	0	4	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	0	10	0	0	17	0	0	17	0
Maximum Green [s]	0	0	0	0	30	0	0	50	0	0	50	0
Amber [s]	0.0	0.0	0.0	0.0	4.1	0.0	0.0	4.4	0.0	0.0	4.4	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	0	0	0	35	0	0	55	0	0	55	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	2.5	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Walk [s]	0	0	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	23	0	0	0	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	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	0.0	0.0	0.0	3.1	0.0	0.0	3.4	0.0	0.0	3.4	0.0
Minimum Recall					No			Yes			Yes	
Maximum Recall					No			No			No	
Pedestrian Recall					Yes			No			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group		L	C	R	C	C	C
C, Cycle Length [s]		88	88	88	88	88	88
L, Total Lost Time per Cycle [s]		5.10	5.10	5.10	5.40	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		3.10	3.10	3.10	3.40	3.40	3.40
g_i, Effective Green Time [s]		30	30	30	48	48	48
g / C, Green / Cycle		0.34	0.34	0.34	0.54	0.54	0.54
(v / s)_i Volume / Saturation Flow Rate		0.21	0.21	0.20	0.33	0.33	0.47
s, saturation flow rate [veh/h]		1597	1629	1411	1644	1642	3192
c, Capacity [veh/h]		544	555	481	888	887	1725
d1, Uniform Delay [s]		24.32	24.32	23.96	13.93	13.94	17.48
k, delay calibration		0.13	0.13	0.11	0.19	0.19	0.15
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.47	1.44	1.16	1.20	1.21	2.00
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.62	0.62	0.59	0.61	0.61	0.87
d, Delay for Lane Group [s/veh]		25.79	25.76	25.12	15.13	15.15	19.48
Lane Group LOS		C	C	C	B	B	B
Critical Lane Group		Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]		5.92	6.03	4.84	7.12	7.13	12.20
50th-Percentile Queue Length [ft]		147.98	150.81	120.97	178.11	178.28	304.91
95th-Percentile Queue Length [veh]		9.91	10.06	8.45	11.50	11.51	17.92
95th-Percentile Queue Length [ft]		247.73	251.51	211.15	287.54	287.77	448.09

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	25.78	25.76	25.12	0.00	15.14	15.15	0.00	19.48	0.00
Movement LOS				C	C	C		B	B		B	
d_A, Approach Delay [s/veh]	0.00			25.58			15.14			19.48		
Approach LOS	A			C			B			B		
d_I, Intersection Delay [s/veh]	19.81											
Intersection LOS	B											
Intersection V/C	0.680											

Sequence

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

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Intersection Level Of Service Report
Intersection 1: Redondo Avenue & Spring Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.836

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	1	0	0	2	0	0
Pocket Length [ft]	250.00	100.00	100.00	100.00	100.00	100.00	120.00	100.00	100.00	220.00	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]	555	0	379	5	3	3	9	1085	388	237	894	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	20.00	0.00	0.00	22.00	1.00	3.00	3.00	1.00	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]	555	0	379	5	3	3	9	1085	388	237	894	5
Peak Hour Factor	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	156	0	106	1	1	1	3	305	109	67	251	1
Total Analysis Volume [veh/h]	624	0	426	6	3	3	10	1219	436	266	1004	6
Pedestrian Volume [ped/h]	0			1			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.20	0.00	0.13	0.00	0.00	0.00	0.01	0.34	0.34	0.08	0.21	0.21
Intersection LOS	D											
Intersection V/C	0.836											

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Intersection Level Of Service Report
Intersection 2: Redondo Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.867

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	0	1	0	1	2	0	1
Pocket Length [ft]	175.00	100.00	150.00	145.00	100.00	100.00	190.00	100.00	190.00	160.00	100.00	160.00
Speed [mph]	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]	209	583	408	271	641	124	68	1521	285	247	1030	122
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.00	1.00	1.00	1.00	2.00	6.00	3.00	1.00	1.00	1.00	1.00	4.00
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]	209	583	408	271	641	124	68	1521	285	247	1030	122
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	56	155	109	72	170	33	18	405	76	66	274	32
Total Analysis Volume [veh/h]	222	620	434	288	682	132	72	1618	303	263	1096	130
Pedestrian Volume [ped/h]	4			4			2			2		
Bicycle Volume [bicycles/h]	0			1			3			1		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.13	0.19	0.09	0.17	0.17	0.05	0.34	0.19	0.08	0.23	0.08
Intersection LOS	D											
Intersection V/C	0.867											

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Intersection Level Of Service Report
Intersection 3: Redondo Avenue & Burnett Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.601

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1
Pocket Length [ft]	100.00	100.00	120.00	100.00	100.00	140.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	1152	38	10	1190	103	52
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	1.00	2.00	21.00
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]	1152	38	10	1190	103	52
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	313	10	3	323	28	14
Total Analysis Volume [veh/h]	1252	41	11	1293	112	57
Pedestrian Volume [ped/h]	0		2		0	
Bicycle Volume [bicycles/h]	0		2		1	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	3	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.40	0.40	0.01	0.40	0.07	0.04
Intersection LOS	B					
Intersection V/C	0.601					

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Intersection Level Of Service Report
Intersection 4: Redondo Avenue & Project Driveway

Control Type:	Two-way stop	Delay (sec / veh):	28.2
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.063

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	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	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	1142	0	0	1247	10	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	0.00	0.00	1.00	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]	1142	0	0	1247	10	62
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	304	0	0	332	3	16
Total Analysis Volume [veh/h]	1215	0	0	1327	11	66
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.01	0.06	0.15
d_M, Delay for Movement [s/veh]	0.00	0.00	11.20	0.00	28.23	15.74
Movement LOS	A	A	B	A	D	C
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.79	0.79
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	19.69	19.69
d_A, Approach Delay [s/veh]	0.00		0.00		17.53	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.52					
Intersection LOS	D					

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Intersection Level Of Service Report

Intersection 5: Redondo Avenue & Industry Drive

Control Type:	Two-way stop	Delay (sec / veh):	67.4
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.386

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	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	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	150.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	33	1077	38	19	1197	47	31	0	54	34	0	51
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	1.00	0.00	0.00	1.00	0.00	3.00	0.00	0.00	0.00	2.00	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]	33	1077	38	19	1197	47	31	0	54	34	0	51
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	1.0000	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	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	296	10	5	329	13	9	0	15	9	0	14
Total Analysis Volume [veh/h]	36	1184	42	21	1315	52	34	0	59	37	0	56
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			Yes	Yes
Number of Storage Spaces in Median	0	0	1	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.01	0.00	0.04	0.01	0.00	0.39	0.00	0.15	0.38	0.00	0.13
d_M, Delay for Movement [s/veh]	12.87	0.00	0.00	11.49	0.00	0.00	67.35	64.28	35.62	63.73	0.00	14.36
Movement LOS	B	A	A	B	A	A	F	F	E	F		B
95th-Percentile Queue Length [veh]	0.24	0.00	0.00	0.11	0.00	0.00	2.72	2.72	2.72	1.54	0.00	0.43
95th-Percentile Queue Length [ft]	5.88	0.00	0.00	2.84	0.00	0.00	67.89	67.89	67.89	38.57	0.00	10.83
d_A, Approach Delay [s/veh]	0.37			0.17			47.23			34.00		
Approach LOS	A			A			E			D		
d_I, Intersection Delay [s/veh]	2.91											
Intersection LOS	F											

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Intersection Level Of Service Report
Intersection 6: Redondo Avenue & Hill Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.784

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	70.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	127	958	1172	114	194	228
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	0.00	1.00	1.00	1.00
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]	127	958	1172	114	194	228
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	255	312	30	52	61
Total Analysis Volume [veh/h]	135	1019	1247	121	206	243
Pedestrian Volume [ped/h]	1		0		2	
Bicycle Volume [bicycles/h]	0		3		2	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	2	6	0	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.32	0.43	0.43	0.13	0.15
Intersection LOS	C					
Intersection V/C	0.784					

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Intersection Level Of Service Report

Intersection 7: Redondo Avenue & Stearns Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.721

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	1	1
Pocket Length [ft]	100.00	100.00	110.00	100.00	70.00	70.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	924	197	233	1164	207	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	0.00	1.00	2.00	1.00
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]	924	197	233	1164	207	154
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	243	52	61	306	54	41
Total Analysis Volume [veh/h]	973	207	245	1225	218	162
Pedestrian Volume [ped/h]	0		0		2	
Bicycle Volume [bicycles/h]	0		5		3	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	3	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.37	0.37	0.15	0.38	0.07	0.08
Intersection LOS	C					
Intersection V/C	0.721					

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Intersection Level Of Service Report

Intersection 8: Redondo Avenue & Pacific Coast Highway

Control Type:	Signalized	Delay (sec / veh):	48.0
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.747

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	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	1	0	0	1	0	0
Pocket Length [ft]	200.00	100.00	100.00	150.00	100.00	65.00	160.00	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]	139	705	290	169	813	196	211	1246	17	284	1182	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	1.00	0.00	1.00	1.00	1.00	0.00	2.00	0.00	0.00	2.00	7.00
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]	139	705	290	169	813	196	211	1246	17	284	1182	42
Peak Hour Factor	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	178	73	43	205	49	53	315	4	72	298	11
Total Analysis Volume [veh/h]	140	712	293	171	821	198	213	1259	17	287	1194	42
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	8			18			19			31		
Bicycle Volume [bicycles/h]	2			1			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	64.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	7	4	0	3	8	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	10	0	7	10	0	7	8	0	7	8	0
Maximum Green [s]	20	50	0	20	50	0	20	33	0	20	33	0
Amber [s]	4.0	4.1	0.0	4.0	4.1	0.0	4.0	4.4	0.0	4.0	4.4	0.0
All red [s]	1.0	1.4	0.0	1.0	1.4	0.0	1.0	1.4	0.0	1.0	1.4	0.0
Split [s]	25	39	0	25	39	0	17	39	0	17	39	0
Vehicle Extension [s]	2.5	3.5	0.0	2.5	3.5	0.0	2.5	3.5	0.0	2.5	3.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	6	0
Pedestrian Clearance [s]	0	16	0	0	16	0	0	20	0	0	20	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]	3.0	3.5	0.0	3.0	3.5	0.0	3.0	3.8	0.0	3.0	3.8	0.0
Minimum Recall	No	Yes		No	Yes		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]	5.0	5.0	0.0	5.0	5.0	0.0	5.0	5.0	0.0	5.0	5.0	0.0
Detector Length [ft]	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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]	123	123	123	123	123	123	123	123	123	123	123	123
L, Total Lost Time per Cycle [s]	5.50	5.50	5.50	5.50	5.50	5.50	5.00	5.80	5.80	5.00	5.80	5.80
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	3.50	3.50	0.00	3.50	3.50	3.00	3.80	3.80	3.00	3.80	3.80
g_i, Effective Green Time [s]	55	40	40	55	42	42	16	32	32	20	35	35
g / C, Green / Cycle	0.45	0.33	0.33	0.45	0.34	0.34	0.13	0.26	0.26	0.16	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.16	0.28	0.29	0.20	0.23	0.13	0.12	0.24	0.24	0.16	0.23	0.23
s, saturation flow rate [veh/h]	898	1881	1651	843	3582	1552	1810	3547	1849	1810	3547	1826
c, Capacity [veh/h]	356	617	542	310	1214	526	242	921	480	293	1022	526
d1, Uniform Delay [s]	23.50	38.60	39.07	27.13	34.88	30.81	52.32	44.14	44.15	51.32	40.47	40.50
k, delay calibration	0.13	0.24	0.25	0.50	0.13	0.13	0.19	0.13	0.35	0.37	0.13	0.33
I, Upstream Filtering Factor	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]	0.85	7.34	10.43	6.91	0.80	0.54	15.97	4.64	18.19	40.23	1.78	8.25
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

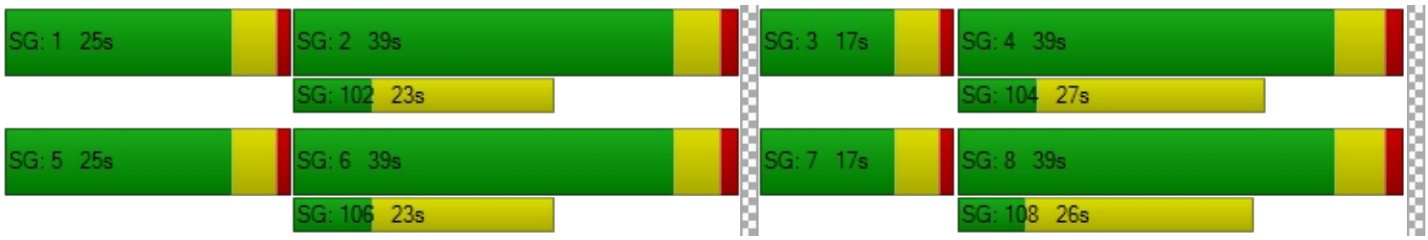
X, volume / capacity	0.39	0.85	0.88	0.55	0.68	0.38	0.88	0.91	0.91	0.98	0.80	0.80
d, Delay for Lane Group [s/veh]	24.35	45.94	49.50	34.04	35.68	31.35	68.29	48.79	62.34	91.55	42.25	48.74
Lane Group LOS	C	D	D	C	D	C	E	D	E	F	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	2.52	15.97	15.05	3.63	10.62	4.55	7.52	12.89	15.25	12.05	11.58	12.90
50th-Percentile Queue Length [ft]	63.05	399.21	376.15	90.74	265.55	113.68	187.94	322.21	381.35	301.15	289.43	322.60
95th-Percentile Queue Length [veh]	4.54	22.52	21.41	6.53	15.97	8.04	12.01	18.78	21.66	17.74	17.16	18.80
95th-Percentile Queue Length [ft]	113.50	563.04	535.19	163.33	399.18	201.11	300.35	469.40	541.48	443.45	428.94	469.89

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.35	46.86	49.50	34.04	35.68	31.35	68.29	53.31	62.34	91.55	44.31	48.74
Movement LOS	C	D	D	C	D	C	E	D	E	F	D	D
d_A, Approach Delay [s/veh]	44.79			34.72			55.56			53.33		
Approach LOS	D			C			E			D		
d_I, Intersection Delay [s/veh]	47.98											
Intersection LOS	D											
Intersection V/C	0.747											

Sequence

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



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Intersection Level Of Service Report

Intersection 9: Grand Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.757

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	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	2	0	1
Pocket Length [ft]	160.00	100.00	100.00	170.00	100.00	100.00	120.00	100.00	100.00	170.00	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			No		

Volumes

Name												
Base Volume Input [veh/h]	44	5	134	94	3	58	74	2093	26	95	1237	60
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	0.00	0.00	2.00	0.00	1.00	4.00	9.00	2.00	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	5	134	94	3	58	74	2093	26	95	1237	60
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	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	1	35	25	1	15	19	551	7	25	326	16
Total Analysis Volume [veh/h]	46	5	141	99	3	61	78	2203	27	100	1302	63
Pedestrian Volume [ped/h]	0			4			3			0		
Bicycle Volume [bicycles/h]	0			1			2			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	15.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.05	0.05	0.06	0.04	0.04	0.05	0.46	0.46	0.03	0.27	0.04
Intersection LOS	C											
Intersection V/C	0.757											

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Intersection Level Of Service Report
Intersection 10: Grand Avenue & Burnett Street

Control Type:	Two-way stop	Delay (sec / veh):	9.7
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.039

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	90.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	29	29	17	100	21	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	0.00	0.00	12.00	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]	29	29	17	100	21	7
Peak Hour Factor	0.6700	0.6700	0.6700	0.6700	0.6700	0.6700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	11	6	37	8	3
Total Analysis Volume [veh/h]	43	43	25	149	31	10
Pedestrian Volume [ped/h]	0		0		7	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
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	0.00	0.00	0.00	0.04	0.01
d_M, Delay for Movement [s/veh]	7.69	0.00	0.00	0.00	9.67	8.49
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.20	0.20	0.00	0.00	0.12	0.03
95th-Percentile Queue Length [ft]	4.98	4.98	0.00	0.00	3.01	0.73
d_A, Approach Delay [s/veh]	3.85		0.00		9.38	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.38					
Intersection LOS	A					

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Intersection Level Of Service Report

Intersection 11: Lakewood Boulevard & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.999

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	0	2	0	1	2	0	0
Pocket Length [ft]	175.00	100.00	100.00	140.00	100.00	100.00	175.00	100.00	300.00	150.00	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]	198	1042	161	141	1309	278	317	1725	295	188	947	535
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	2.00	3.00	1.00	1.00	4.00	2.00	0.00	1.00	1.00	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
Total Hourly Volume [veh/h]	198	1042	161	141	1309	278	317	1725	295	188	947	535
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	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	269	41	36	337	72	82	445	76	48	244	138
Total Analysis Volume [veh/h]	204	1074	166	145	1349	287	327	1778	304	194	976	552
Pedestrian Volume [ped/h]	4			6			7			2		
Bicycle Volume [bicycles/h]	2			1			2			2		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.19	0.19	0.05	0.34	0.34	0.10	0.37	0.13	0.06	0.24	0.24
Intersection LOS	E											
Intersection V/C	0.999											

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Intersection Level Of Service Report
Intersection 12: Temple Avenue & Spring Street

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

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	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	150.00	100.00	100.00	130.00	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			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	394	1	122	29	6	11	23	1329	269	66	1467	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00	2.00	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]	394	1	122	29	6	11	23	1329	269	66	1467	3
Peak Hour Factor	1.0000	0.8600	0.8600	0.8600	0.8600	1.0000	1.0000	1.0000	1.0000	0.8600	1.0000	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	99	0	35	8	2	3	6	332	67	19	367	1
Total Analysis Volume [veh/h]	394	1	142	34	7	11	23	1329	269	77	1467	3
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			1			1			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.09	0.09	0.02	0.01	0.01	0.01	0.33	0.33	0.05	0.31	0.31
Intersection LOS	C											
Intersection V/C	0.719											

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Intersection Level Of Service Report
Intersection 13: Temple Avenue & I-405 Northbound Off-Ramps

Control Type:	Signalized	Delay (sec / veh):	10.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.424

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
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	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	459	0	0	295	346	136
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	3.00	4.00	1.00
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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	459	0	0	295	346	136
Peak Hour Factor	0.8600	1.0000	1.0000	0.8600	0.8600	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	133	0	0	86	101	40
Total Analysis Volume [veh/h]	534	0	0	343	402	158
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		1	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	4	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	10	0	0	10	10	0
Maximum Green [s]	30	0	0	30	25	0
Amber [s]	4.4	0.0	0.0	4.4	4.1	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	55	0	0	55	35	0
Vehicle Extension [s]	4.0	0.0	0.0	4.0	4.0	0.0
Walk [s]	7	0	0	0	0	0
Pedestrian Clearance [s]	10	0	0	0	0	0
Rest In Walk	Yes			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.4	0.0	0.0	3.4	3.1	0.0
Minimum Recall	Yes			Yes	No	
Maximum Recall	No			No	No	
Pedestrian Recall	Yes			No	No	
Detector Location [ft]	5.0	0.0	0.0	5.0	5.0	0.0
Detector Length [ft]	20.0	0.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	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	R
C, Cycle Length [s]	42	42	42	42
L, Total Lost Time per Cycle [s]	5.40	5.40	5.10	5.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.10	3.10
g_i, Effective Green Time [s]	17	17	14	14
g / C, Green / Cycle	0.41	0.41	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.17	0.11	0.26	0.11
s, saturation flow rate [veh/h]	3192	3161	1566	1439
c, Capacity [veh/h]	1304	1291	532	489
d1, Uniform Delay [s]	8.77	8.19	12.23	10.21
k, delay calibration	0.15	0.15	0.15	0.15
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.29	0.16	3.12	0.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.41	0.27	0.76	0.32
d, Delay for Lane Group [s/veh]	9.06	8.35	15.36	10.75
Lane Group LOS	A	A	B	B
Critical Lane Group	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	1.32	0.79	3.04	0.92
50th-Percentile Queue Length [ft]	32.99	19.69	75.93	22.96
95th-Percentile Queue Length [veh]	2.38	1.42	5.47	1.65
95th-Percentile Queue Length [ft]	59.38	35.44	136.67	41.33

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	9.06	0.00	0.00	8.35	15.36	10.75
Movement LOS	A			A	B	B
d_A, Approach Delay [s/veh]	9.06		8.35		14.06	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	10.84					
Intersection LOS	B					
Intersection V/C	0.424					

Sequence

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

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Intersection Level Of Service Report
Intersection 14: Temple Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.787

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]	130.00	100.00	100.00	130.00	100.00	100.00	200.00	100.00	100.00	195.00	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]	57	213	46	149	417	238	45	1589	141	41	1271	71
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	2.00	3.00	2.00	1.00	13.00	1.00	1.00	10.00	1.00	6.00
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]	57	213	46	149	417	238	45	1589	141	41	1271	71
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	57	12	40	111	63	12	423	38	11	338	19
Total Analysis Volume [veh/h]	61	227	49	159	444	253	48	1690	150	44	1352	76
Pedestrian Volume [ped/h]	0			7			2			2		
Bicycle Volume [bicycles/h]	2			2			3			2		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.09	0.09	0.10	0.22	0.22	0.03	0.38	0.38	0.03	0.30	0.30
Intersection LOS	C											
Intersection V/C	0.787											

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Intersection Level Of Service Report

Intersection 15: Cherry Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.932

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	2	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	105.00	175.00	100.00	100.00	245.00	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]	156	851	213	288	904	195	227	1345	134	274	1139	218
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	3.00	0.00	1.00	2.00	1.00	1.00	0.00	1.00	1.00	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]	156	851	213	288	904	195	227	1345	134	274	1139	218
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	40	219	55	74	233	50	59	347	35	71	294	56
Total Analysis Volume [veh/h]	161	877	220	297	932	201	234	1387	138	282	1174	225
Pedestrian Volume [ped/h]	7			3			8			6		
Bicycle Volume [bicycles/h]	0			4			4			3		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.18	0.05	0.09	0.24	0.24	0.07	0.32	0.32	0.09	0.29	0.29
Intersection LOS	E											
Intersection V/C	0.932											

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Intersection Level Of Service Report

Intersection 16: I-405 Southbound Off-Ramps & Spring Street

Control Type:	Signalized	Delay (sec / veh):	9.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.527

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	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	180.00	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			Yes			Yes			No		

Volumes

Name												
Base Volume Input [veh/h]	0	0	0	423	3	98	0	1298	10	0	1267	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	5.00	0.00	11.00	2.00	1.00	0.00	2.00	1.00	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]	0	0	0	423	3	98	0	1298	10	0	1267	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	0.9100	0.9100	1.0000	1.0000	0.9100	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	106	1	27	0	325	3	0	317	0
Total Analysis Volume [veh/h]	0	0	0	423	3	108	0	1298	11	0	1267	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			3			0		
Bicycle Volume [bicycles/h]	0			0			1			1		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	30.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	0	0	0	4	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	0	10	0	0	17	0	0	17	0
Maximum Green [s]	0	0	0	0	30	0	0	50	0	0	50	0
Amber [s]	0.0	0.0	0.0	0.0	4.1	0.0	0.0	4.4	0.0	0.0	4.4	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	0	0	0	35	0	0	55	0	0	55	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	2.5	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Walk [s]	0	0	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	23	0	0	0	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	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	0.0	0.0	0.0	3.1	0.0	0.0	3.4	0.0	0.0	3.4	0.0
Minimum Recall					No			Yes			Yes	
Maximum Recall					No			No			No	
Pedestrian Recall					No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group		L	C	R	C	C	C
C, Cycle Length [s]		51	51	51	51	51	51
L, Total Lost Time per Cycle [s]		5.10	5.10	5.10	5.40	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		3.10	3.10	3.10	3.40	3.40	3.40
g_i, Effective Green Time [s]		10	10	10	30	30	30
g / C, Green / Cycle		0.21	0.21	0.21	0.59	0.59	0.59
(v / s)_i Volume / Saturation Flow Rate		0.13	0.13	0.08	0.39	0.39	0.39
s, saturation flow rate [veh/h]		1551	1630	1309	1693	1687	3224
c, Capacity [veh/h]		319	335	269	996	993	1896
d1, Uniform Delay [s]		18.55	18.55	17.51	7.04	7.05	7.11
k, delay calibration		0.08	0.08	0.08	0.15	0.15	0.15
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.68	1.60	0.72	1.06	1.07	0.59
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.65	0.65	0.40	0.66	0.66	0.67
d, Delay for Lane Group [s/veh]		20.23	20.15	18.23	8.10	8.12	7.70
Lane Group LOS		C	C	B	A	A	A
Critical Lane Group		Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]		2.15	2.25	1.03	3.42	3.43	3.22
50th-Percentile Queue Length [ft]		53.65	56.19	25.85	85.58	85.81	80.40
95th-Percentile Queue Length [veh]		3.86	4.05	1.86	6.16	6.18	5.79
95th-Percentile Queue Length [ft]		96.58	101.14	46.53	154.04	154.47	144.73

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	20.19	20.15	18.23	0.00	8.11	8.12	0.00	7.70	0.00
Movement LOS				C	C	B		A	A		A	
d_A, Approach Delay [s/veh]	0.00			19.79			8.11			7.70		
Approach LOS	A			B			A			A		
d_I, Intersection Delay [s/veh]	9.95											
Intersection LOS	A											
Intersection V/C	0.527											

Sequence

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

Appendix C

Proposed Project Trip Generation Calculations

TRIP GENERATION
2300 REDONDO AVENUE PROJECT

Table 1: Trip Generation Rates								
Land Use	**Rate**	**Daily**	**AM Peak Hour**			**PM Peak Hour**		
			In	**Out**	**Total**	**In**	**Out**	**Total**
Manufacturing (ITE Code 140)	per 1,000 sf	[a]	88%	12%	0.73	12%	88%	[b]

Table 2: Trip Generation Estimates								
Land Use	**Size**	**Daily**	**AM Peak Hour**			**PM Peak Hour**		
			In	**Out**	**Total**	**In**	**Out**	**Total**
Manufacturing (ITE Code 140)	427,565 sf	1,638	275	37	312	38	280	318
(1) Estimated Number of Passenger Vehicles (assumed to be 80%)	-- --	1,310	220	30	250	30	224	254
Estimated Number of Trucks (assumed to be 20%)	-- --	328	55	7	62	8	56	64
(2) Trucks adjusted to Passenger Vehicles (assumed PCE 2.0)	-- --	656	110	14	124	16	112	128
(1) + (2) TOTAL		**1,966**	**330**	**44**	**374**	**46**	**336**	**382**

Notes:
sf - square feet
[a] The following equation was used to calculate the number of daily trips:
$T = 3.88(X) - 20.70$
[b] The following equation was used to calculate the number of trips during the PM peak hour:
$T = 0.78(X) - 15.97$

Appendix D

LOS and Signal Warrant Worksheets – Existing Plus Project Conditions

Generated with PTV VISTRO

Version 5.00-03

Intersection Level Of Service Report

Intersection 1: Redondo Avenue & Spring Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.775

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	1	0	0	2	0	0
Pocket Length [ft]	250.00	100.00	100.00	100.00	100.00	100.00	120.00	100.00	100.00	220.00	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]	535	2	286	5	2	1	3	729	338	314	1296	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 [%]	1.00	0.00	1.00	0.00	0.00	0.00	0.00	3.00	2.00	3.00	1.00	10.00
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	1	0	0	0	0	0	44	11	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	543	2	287	5	2	1	3	729	382	325	1296	10
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	149	1	79	1	1	0	1	200	105	89	356	3
Total Analysis Volume [veh/h]	597	2	315	5	2	1	3	801	420	357	1424	11
Pedestrian Volume [ped/h]	0			1			0			0		
Bicycle Volume [bicycles/h]	1			0			1			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.19	0.10	0.10	0.00	0.00	0.00	0.00	0.25	0.25	0.11	0.30	0.30
Intersection LOS	C											
Intersection V/C	0.775											

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Intersection Level Of Service Report
Intersection 2: Redondo Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.789

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	2	0	1	2	0	0	1	0	1	2	0	1
Pocket Length [ft]	175.00	100.00	150.00	145.00	100.00	100.00	190.00	100.00	190.00	160.00	100.00	160.00
Speed [mph]	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]	254	929	465	108	358	48	118	1020	159	196	1322	275
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	1.00	11.00	2.00	4.00	2.00	3.00	7.00	5.00	2.00	3.00
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]	11	9	16	0	55	0	0	0	100	83	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	265	938	481	108	413	48	118	1020	259	279	1322	275
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	70	249	128	29	110	13	31	271	69	74	352	73
Total Analysis Volume [veh/h]	282	998	512	115	439	51	126	1085	276	297	1406	293
Pedestrian Volume [ped/h]	5			3			0			2		
Bicycle Volume [bicycles/h]	3			0			1			0		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.21	0.23	0.04	0.10	0.10	0.08	0.23	0.17	0.09	0.29	0.18
Intersection LOS	C											
Intersection V/C	0.789											

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Intersection Level Of Service Report
Intersection 3: Redondo Avenue & Burnett Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.758

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1
Pocket Length [ft]	100.00	100.00	120.00	100.00	100.00	140.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	1524	84	31	787	29	23
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	0.00	4.00	10.00	17.00
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]	23	24	75	163	0	13
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]	1547	108	106	950	29	36
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	407	28	28	250	8	9
Total Analysis Volume [veh/h]	1628	114	112	1000	31	38
Pedestrian Volume [ped/h]	0		6		0	
Bicycle Volume [bicycles/h]	4		0		0	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	3	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.54	0.54	0.07	0.31	0.02	0.02
Intersection LOS	C					
Intersection V/C	0.758					

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Intersection Level Of Service Report
Intersection 4: Redondo Avenue & Project Driveway

Control Type:	Two-way stop	Delay (sec / veh):	49.2
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.024

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	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	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	1585	0	0	820	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	0.00	0.00	3.00	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]	34	22	78	85	2	13
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]	1619	22	78	905	2	13
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	422	6	20	236	1	3
Total Analysis Volume [veh/h]	1686	23	81	943	2	14
Pedestrian Volume [ped/h]	0		0		1	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.22	0.01	0.02	0.05
d_M, Delay for Movement [s/veh]	0.00	0.00	17.19	0.00	49.17	17.97
Movement LOS	A	A	C	A	E	C
95th-Percentile Queue Length [veh]	0.00	0.00	0.81	0.00	0.22	0.22
95th-Percentile Queue Length [ft]	0.00	0.00	20.16	0.00	5.58	5.58
d_A, Approach Delay [s/veh]	0.00		1.36		21.87	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.63					
Intersection LOS	E					

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Intersection Level Of Service Report

Intersection 5: Redondo Avenue & Industry Drive

Control Type:	Two-way stop	Delay (sec / veh):	285.4
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	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	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	150.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	45	1571	27	0	705	56	20	0	25	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	0.00	2.00	3.00	2.00	15.00	0.00	4.00	0.00	2.00	4.00
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	46	20	85	2	0	0	0	0	4	0	10
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	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	1617	47	85	707	56	20	0	25	4	0	10
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	1.0000	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	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	417	12	22	182	14	5	0	6	1	0	3
Total Analysis Volume [veh/h]	46	1667	48	88	729	58	21	0	26	4	0	10
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			Yes	Yes
Number of Storage Spaces in Median	0	0	1	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.02	0.00	0.24	0.01	0.00	0.27	0.00	0.04	0.08	0.00	0.03
d_M, Delay for Movement [s/veh]	9.60	0.00	0.00	17.94	0.00	0.00	62.31	285.40	21.73	78.58	0.00	17.57
Movement LOS	A	A	A	C	A	A	F	F	C	F		C
95th-Percentile Queue Length [veh]	0.18	0.00	0.00	0.93	0.00	0.00	1.26	1.26	1.26	0.24	0.00	0.10
95th-Percentile Queue Length [ft]	4.40	0.00	0.00	23.16	0.00	0.00	31.41	31.41	31.41	5.91	0.00	2.61
d_A, Approach Delay [s/veh]	0.25			1.80			39.86			35.00		
Approach LOS	A			A			E			E		
d_I, Intersection Delay [s/veh]	1.63											
Intersection LOS	F											

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Intersection Level Of Service Report
Intersection 6: Redondo Avenue & Hill Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.755

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	70.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	139	1405	664	74	240	149
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	1.00	3.00	0.00	0.00	1.00
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	66	6	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]	139	1471	670	74	240	149
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	383	174	19	63	39
Total Analysis Volume [veh/h]	145	1532	698	77	250	155
Pedestrian Volume [ped/h]	0		0		7	
Bicycle Volume [bicycles/h]	5		0		1	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	2	6	0	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.48	0.24	0.24	0.16	0.10
Intersection LOS	C					
Intersection V/C	0.755					

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Intersection Level Of Service Report

Intersection 7: Redondo Avenue & Stearns Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.779

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	1	1
Pocket Length [ft]	100.00	100.00	110.00	100.00	70.00	70.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	1352	151	118	698	216	178
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	3.00	3.00	3.00	0.00	2.00
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]	55	0	1	5	0	11
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]	1407	151	119	703	216	189
Peak Hour Factor	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	359	39	30	179	55	48
Total Analysis Volume [veh/h]	1436	154	121	717	220	193
Pedestrian Volume [ped/h]	0		0		1	
Bicycle Volume [bicycles/h]	3		2		2	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	3	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.50	0.50	0.08	0.22	0.07	0.09
Intersection LOS	C					
Intersection V/C	0.779					

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Intersection Level Of Service Report

Intersection 8: Redondo Avenue & Pacific Coast Highway

Control Type:	Signalized	Delay (sec / veh):	62.2
Analysis Method:	HCM 2010	Level Of Service:	E
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	1	0	0	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	200.00	100.00	100.00	150.00	100.00	65.00	160.00	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]	128	958	235	88	426	150	221	1032	10	231	1318	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 [%]	1.00	1.00	1.00	2.00	3.00	5.00	2.00	2.00	0.00	2.00	3.00	3.00
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	11	0	2	1	2	22	0	0	0	0	22
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
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	969	235	90	427	152	243	1032	10	231	1318	84
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	250	61	23	110	39	63	266	3	60	340	22
Total Analysis Volume [veh/h]	132	999	242	93	440	157	251	1064	10	238	1359	87
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	5			6			8			16		
Bicycle Volume [bicycles/h]	3			1			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	47.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	7	4	0	3	8	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	10	0	7	10	0	7	8	0	7	8	0
Maximum Green [s]	20	50	0	20	50	0	20	33	0	20	33	0
Amber [s]	4.0	4.1	0.0	4.0	4.1	0.0	4.0	4.4	0.0	4.0	4.4	0.0
All red [s]	1.0	1.4	0.0	1.0	1.4	0.0	1.0	1.4	0.0	1.0	1.4	0.0
Split [s]	25	42	0	25	42	0	17	36	0	17	36	0
Vehicle Extension [s]	2.5	3.5	0.0	2.5	3.5	0.0	2.5	3.5	0.0	2.5	3.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	6	0
Pedestrian Clearance [s]	0	16	0	0	16	0	0	20	0	0	20	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]	3.0	3.5	0.0	3.0	3.5	0.0	3.0	3.8	0.0	3.0	3.8	0.0
Minimum Recall	No	Yes		No	Yes		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]	5.0	5.0	0.0	5.0	5.0	0.0	5.0	5.0	0.0	5.0	5.0	0.0
Detector Length [ft]	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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]	129	129	129	129	129	129	129	129	129	129	129	129
L, Total Lost Time per Cycle [s]	5.50	5.50	5.50	5.50	5.50	5.50	5.00	5.80	5.80	5.00	5.80	5.80
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	3.50	3.50	0.00	3.50	3.50	3.00	3.80	3.80	3.00	3.80	3.80
g_i, Effective Green Time [s]	60	48	48	60	47	47	20	34	34	19	33	33
g / C, Green / Cycle	0.46	0.37	0.37	0.46	0.36	0.36	0.15	0.26	0.26	0.15	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.12	0.34	0.35	0.14	0.13	0.10	0.14	0.20	0.20	0.13	0.27	0.27
s, saturation flow rate [veh/h]	1106	1881	1736	665	3512	1509	1774	3547	1854	1774	3512	1786
c, Capacity [veh/h]	509	699	645	242	1279	549	274	930	486	263	898	457
d1, Uniform Delay [s]	20.68	38.57	39.04	28.43	29.83	29.13	53.72	43.83	43.83	54.09	48.02	48.02
k, delay calibration	0.13	0.37	0.38	0.32	0.13	0.13	0.33	0.13	0.28	0.29	0.13	0.47
I, Upstream Filtering Factor	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	14.46	18.57	2.93	0.19	0.34	27.13	1.56	6.09	24.52	36.75	60.41
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

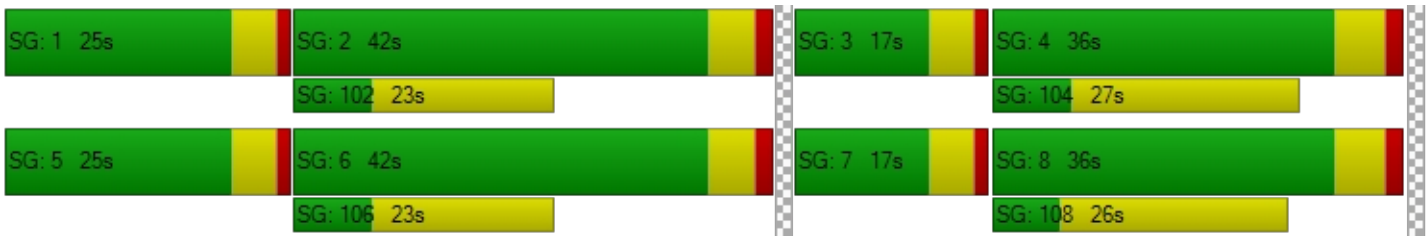
X, volume / capacity	0.26	0.91	0.93	0.38	0.34	0.29	0.92	0.76	0.76	0.91	1.07	1.07
d, Delay for Lane Group [s/veh]	21.00	53.03	57.61	31.35	30.03	29.47	80.85	45.39	49.92	78.60	84.76	108.43
Lane Group LOS	C	D	E	C	C	C	F	D	D	E	F	F
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	2.38	21.77	21.46	1.80	5.04	3.54	10.08	10.56	11.65	9.39	18.93	22.25
50th-Percentile Queue Length [ft]	59.40	544.31	536.39	45.05	126.03	88.51	251.91	264.05	291.34	234.64	473.26	556.31
95th-Percentile Queue Length [veh]	4.28	29.43	29.05	3.24	8.72	6.37	15.28	15.89	17.25	14.41	27.08	31.22
95th-Percentile Queue Length [ft]	106.92	735.63	726.31	81.09	218.08	159.33	382.06	397.30	431.31	360.25	677.04	780.53

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	21.00	54.68	57.61	31.35	30.03	29.47	80.85	46.92	49.92	78.60	91.75	108.43
Movement LOS	C	D	E	C	C	C	F	D	D	E	F	F
d_A, Approach Delay [s/veh]	51.96			30.08			53.37			90.75		
Approach LOS	D			C			D			F		
d_I, Intersection Delay [s/veh]	62.23											
Intersection LOS	E											
Intersection V/C	0.794											

Sequence

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



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Intersection Level Of Service Report

Intersection 9: Grand Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.667

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	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	2	0	1
Pocket Length [ft]	160.00	100.00	100.00	170.00	100.00	100.00	120.00	100.00	100.00	170.00	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			No		

Volumes

Name												
Base Volume Input [veh/h]	21	3	20	28	4	40	71	1293	71	213	1839	114
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	14.00	0.00	25.00	0.00	0.00	3.00	1.00	3.00	3.00	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	3	0	0	0	0	16	0	28	83	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	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	3	23	28	4	40	71	1309	71	241	1922	114
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	1	6	7	1	11	19	348	19	64	511	30
Total Analysis Volume [veh/h]	22	3	24	30	4	43	76	1393	76	256	2045	121
Pedestrian Volume [ped/h]	0			9			10			0		
Bicycle Volume [bicycles/h]	0			0			2			1		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	15.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.02	0.03	0.03	0.05	0.31	0.31	0.08	0.43	0.08
Intersection LOS	B											
Intersection V/C	0.667											

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Intersection Level Of Service Report
Intersection 10: Grand Avenue & Burnett Street

Control Type:	Two-way stop	Delay (sec / veh):	9.1
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.053

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	90.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	7	5	43	67	41	24
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	43.00	20.00	2.00	1.00	0.00	4.00
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	28	3	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]	7	5	43	95	44	24
Peak Hour Factor	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	1	12	27	12	7
Total Analysis Volume [veh/h]	8	6	48	107	49	27
Pedestrian Volume [ped/h]	0		0		5	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
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	0.00	0.00	0.00	0.05	0.03
d_M, Delay for Movement [s/veh]	8.02	0.00	0.00	0.00	9.12	8.68
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.04	0.04	0.00	0.00	0.17	0.08
95th-Percentile Queue Length [ft]	0.89	0.89	0.00	0.00	4.20	2.07
d_A, Approach Delay [s/veh]	4.58		0.00		8.97	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.04					
Intersection LOS	A					

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Intersection Level Of Service Report

Intersection 11: Lakewood Boulevard & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.118

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	0	2	0	1	2	0	0
Pocket Length [ft]	175.00	100.00	100.00	140.00	100.00	100.00	175.00	100.00	300.00	150.00	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]	292	1336	207	105	1239	501	199	1097	134	98	1411	793
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	1.00	1.00	0.00	2.00	3.00	5.00	3.00	4.00	4.00	1.00	1.00
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	99	3	15	0	0	11	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	292	1336	207	105	1239	600	202	1112	134	98	1422	793
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	78	359	56	28	333	161	54	299	36	26	382	213
Total Analysis Volume [veh/h]	314	1437	223	113	1332	645	217	1196	144	105	1529	853
Pedestrian Volume [ped/h]	6			5			5			1		
Bicycle Volume [bicycles/h]	0			0			0			2		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.26	0.26	0.04	0.41	0.41	0.07	0.25	0.00	0.03	0.37	0.37
Intersection LOS	F											
Intersection V/C	1.118											

Generated with PTV VISTRO

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Intersection Level Of Service Report

Intersection 12: Temple Avenue & Spring Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.688

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	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	150.00	100.00	100.00	130.00	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			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	396	17	98	3	2	4	33	1075	240	113	1650	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	6.00	3.00	0.00	0.00	0.00	6.00	3.00	3.00	4.00	1.00	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	0	11	0	0	0	0	33	14	0	8	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	400	17	109	3	2	4	33	1108	254	113	1658	3
Peak Hour Factor	1.0000	0.8900	0.8900	0.8900	0.8900	1.0000	1.0000	1.0000	1.0000	0.8900	1.0000	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	100	5	31	1	1	1	8	277	64	32	415	1
Total Analysis Volume [veh/h]	400	19	122	3	2	4	33	1108	254	127	1658	3
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			4			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.09	0.09	0.00	0.00	0.00	0.02	0.28	0.28	0.08	0.35	0.35
Intersection LOS	B											
Intersection V/C	0.688											

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Intersection Level Of Service Report
Intersection 13: Temple Avenue & I-405 Northbound Off-Ramps

Control Type:	Signalized	Delay (sec / veh):	9.3
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.324

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
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	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	377	0	0	346	233	127
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.00	2.00	2.00	2.00	5.00	5.00
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]	4	0	0	14	25	11
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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	381	0	0	360	258	138
Peak Hour Factor	0.8900	1.0000	1.0000	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	107	0	0	101	72	39
Total Analysis Volume [veh/h]	428	0	0	404	290	155
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	2		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	4	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	10	0	0	10	10	0
Maximum Green [s]	30	0	0	30	25	0
Amber [s]	4.4	0.0	0.0	4.4	4.1	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	55	0	0	55	35	0
Vehicle Extension [s]	4.0	0.0	0.0	4.0	4.0	0.0
Walk [s]	7	0	0	0	0	0
Pedestrian Clearance [s]	10	0	0	0	0	0
Rest In Walk	Yes			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.4	0.0	0.0	3.4	3.1	0.0
Minimum Recall	Yes			Yes	No	
Maximum Recall	No			No	No	
Pedestrian Recall	Yes			No	No	
Detector Location [ft]	5.0	0.0	0.0	5.0	5.0	0.0
Detector Length [ft]	20.0	0.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	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	R
C, Cycle Length [s]	38	38	38	38
L, Total Lost Time per Cycle [s]	5.40	5.40	5.10	5.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.10	3.10
g_i, Effective Green Time [s]	17	17	10	10
g / C, Green / Cycle	0.45	0.45	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.14	0.13	0.19	0.11
s, saturation flow rate [veh/h]	3131	3192	1551	1384
c, Capacity [veh/h]	1403	1430	428	382
d1, Uniform Delay [s]	6.71	6.63	12.27	11.23
k, delay calibration	0.15	0.15	0.15	0.15
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.17	0.15	2.67	0.99
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.31	0.28	0.68	0.41
d, Delay for Lane Group [s/veh]	6.88	6.79	14.94	12.22
Lane Group LOS	A	A	B	B
Critical Lane Group	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	0.76	0.71	2.02	0.94
50th-Percentile Queue Length [ft]	18.98	17.67	50.41	23.40
95th-Percentile Queue Length [veh]	1.37	1.27	3.63	1.68
95th-Percentile Queue Length [ft]	34.16	31.81	90.74	42.12

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	6.88	0.00	0.00	6.79	14.94	12.22
Movement LOS	A			A	B	B
d_A, Approach Delay [s/veh]	6.88		6.79		13.99	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	9.33					
Intersection LOS	A					
Intersection V/C	0.324					

Sequence

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

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Intersection Level Of Service Report
Intersection 14: Temple Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.689

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	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	130.00	100.00	100.00	130.00	100.00	100.00	200.00	100.00	100.00	195.00	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]	92	348	72	61	192	138	64	1165	81	29	1439	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 [%]	9.00	1.00	8.00	11.00	4.00	6.00	0.00	2.00	2.00	0.00	2.00	5.00
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	38	0	0	0	62	0	0	7	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]	92	348	72	99	192	138	64	1227	81	29	1446	85
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	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	90	19	26	49	36	16	316	21	7	373	22
Total Analysis Volume [veh/h]	95	359	74	102	198	142	66	1265	84	30	1491	88
Pedestrian Volume [ped/h]	1			0			2			2		
Bicycle Volume [bicycles/h]	3			0			2			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.14	0.14	0.06	0.11	0.11	0.04	0.28	0.28	0.02	0.33	0.33
Intersection LOS	B											
Intersection V/C	0.689											

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Version 5.00-03

Intersection Level Of Service Report
Intersection 15: Cherry Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.864

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	2	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	105.00	175.00	100.00	100.00	245.00	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]	156	1039	202	210	850	146	204	947	94	219	1143	131
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	2.00	1.00	3.00	3.00	1.00	1.00	2.00	5.00	4.00	3.00	4.00
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	28	0	0	0	34	0	0	4	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]	156	1039	202	238	850	146	204	981	94	219	1147	134
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	41	276	54	63	226	39	54	261	25	58	305	36
Total Analysis Volume [veh/h]	166	1105	215	253	904	155	217	1044	100	233	1220	143
Pedestrian Volume [ped/h]	3			5			11			3		
Bicycle Volume [bicycles/h]	1			0			2			1		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.23	0.06	0.08	0.22	0.22	0.07	0.24	0.24	0.07	0.28	0.28
Intersection LOS	D											
Intersection V/C	0.864											

Generated with PTV VISTRO

Version 5.00-03

Intersection Level Of Service Report

Intersection 16: I-405 Southbound Off-Ramps & Spring Street

Control Type:	Signalized	Delay (sec / veh):	20.1
Analysis Method:	HCM 2010	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	180.00	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			Yes			Yes			No		

Volumes

Name												
Base Volume Input [veh/h]	0	0	0	683	2	255	0	1087	4	0	1492	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	0.00	3.00	2.00	4.00	25.00	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	36	0	0	0	11	0	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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	719	2	255	0	1098	4	0	1493	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	180	1	71	0	275	1	0	373	0
Total Analysis Volume [veh/h]	0	0	0	719	2	283	0	1098	4	0	1493	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			1			0			0		
Bicycle Volume [bicycles/h]	0			0			3			1		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	15.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	0	0	0	4	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	0	10	0	0	17	0	0	17	0
Maximum Green [s]	0	0	0	0	30	0	0	50	0	0	50	0
Amber [s]	0.0	0.0	0.0	0.0	4.1	0.0	0.0	4.4	0.0	0.0	4.4	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	0	0	0	35	0	0	55	0	0	55	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	2.5	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Walk [s]	0	0	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	23	0	0	0	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	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	0.0	0.0	0.0	3.1	0.0	0.0	3.4	0.0	0.0	3.4	0.0
Minimum Recall					No			Yes			Yes	
Maximum Recall					No			No			No	
Pedestrian Recall					Yes			No			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group		L	C	R	C	C	C
C, Cycle Length [s]		88	88	88	88	88	88
L, Total Lost Time per Cycle [s]		5.10	5.10	5.10	5.40	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		3.10	3.10	3.10	3.40	3.40	3.40
g_i, Effective Green Time [s]		30	30	30	48	48	48
g / C, Green / Cycle		0.34	0.34	0.34	0.54	0.54	0.54
(v / s)_i Volume / Saturation Flow Rate		0.22	0.22	0.20	0.34	0.34	0.47
s, saturation flow rate [veh/h]		1597	1629	1411	1644	1642	3192
c, Capacity [veh/h]		544	555	480	889	887	1725
d1, Uniform Delay [s]		24.69	24.68	23.97	14.00	14.01	17.49
k, delay calibration		0.16	0.16	0.11	0.19	0.19	0.15
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		2.00	1.96	1.16	1.25	1.26	2.00
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.66	0.66	0.59	0.62	0.62	0.87
d, Delay for Lane Group [s/veh]		26.69	26.64	25.13	15.25	15.27	19.49
Lane Group LOS		C	C	C	B	B	B
Critical Lane Group		Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]		6.39	6.51	4.84	7.24	7.25	12.21
50th-Percentile Queue Length [ft]		159.70	162.72	121.03	181.04	181.23	305.31
95th-Percentile Queue Length [veh]		10.53	10.69	8.45	11.66	11.66	17.94
95th-Percentile Queue Length [ft]		263.32	267.32	211.24	291.38	291.61	448.59

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	26.66	26.64	25.13	0.00	15.26	15.27	0.00	19.49	0.00
Movement LOS				C	C	C		B	B		B	
d_A, Approach Delay [s/veh]	0.00			26.23			15.26			19.49		
Approach LOS	A			C			B			B		
d_I, Intersection Delay [s/veh]	20.07											
Intersection LOS	C											
Intersection V/C	0.691											

Sequence

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

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Intersection Level Of Service Report
Intersection 1: Redondo Avenue & Spring Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.859

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	0	0	0	1	0	0	2	0	0
Pocket Length [ft]	250.00	100.00	100.00	100.00	100.00	100.00	120.00	100.00	100.00	220.00	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]	555	0	379	5	3	3	9	1085	388	237	894	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	20.00	0.00	0.00	22.00	1.00	3.00	3.00	1.00	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]	56	0	11	0	0	0	0	0	6	1	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	611	0	390	5	3	3	9	1085	394	238	894	5
Peak Hour Factor	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	172	0	110	1	1	1	3	305	111	67	251	1
Total Analysis Volume [veh/h]	687	0	438	6	3	3	10	1219	443	267	1004	6
Pedestrian Volume [ped/h]	0			1			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.21	0.00	0.14	0.00	0.00	0.00	0.01	0.35	0.35	0.08	0.21	0.21
Intersection LOS	D											
Intersection V/C	0.859											

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Intersection Level Of Service Report
Intersection 2: Redondo Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.935

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	0	1	0	1	2	0	1
Pocket Length [ft]	175.00	100.00	150.00	145.00	100.00	100.00	190.00	100.00	190.00	160.00	100.00	160.00
Speed [mph]	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]	209	583	408	271	641	124	68	1521	285	247	1030	122
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.00	1.00	1.00	1.00	2.00	6.00	3.00	1.00	1.00	1.00	1.00	4.00
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]	92	67	101	0	7	0	0	0	14	11	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	301	650	509	271	648	124	68	1521	299	258	1030	122
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	80	173	135	72	172	33	18	405	80	69	274	32
Total Analysis Volume [veh/h]	320	691	541	288	689	132	72	1618	318	274	1096	130
Pedestrian Volume [ped/h]	4			4			2			2		
Bicycle Volume [bicycles/h]	0			1			3			1		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.14	0.25	0.09	0.17	0.17	0.05	0.34	0.20	0.09	0.23	0.08
Intersection LOS	E											
Intersection V/C	0.935											

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Intersection Level Of Service Report
Intersection 3: Redondo Avenue & Burnett Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.690

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1
Pocket Length [ft]	100.00	100.00	120.00	100.00	100.00	140.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	1152	38	10	1190	103	52
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	1.00	2.00	21.00
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]	178	0	10	22	24	82
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]	1330	38	20	1212	127	134
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	361	10	5	329	35	36
Total Analysis Volume [veh/h]	1446	41	22	1317	138	146
Pedestrian Volume [ped/h]	0		2		0	
Bicycle Volume [bicycles/h]	0		2		1	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	3	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.46	0.46	0.01	0.41	0.09	0.09
Intersection LOS	B					
Intersection V/C	0.690					

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Intersection Level Of Service Report
Intersection 4: Redondo Avenue & Project Driveway

Control Type:	Two-way stop	Delay (sec / veh):	35.6
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.150

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	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	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	1142	0	0	1247	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	0.00	0.00	1.00	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]	88	2	10	36	22	90
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]	1230	2	10	1283	22	90
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	327	1	3	341	6	24
Total Analysis Volume [veh/h]	1309	2	11	1365	23	96
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.02	0.01	0.15	0.23
d_M, Delay for Movement [s/veh]	0.00	0.00	11.88	0.00	35.56	20.72
Movement LOS	A	A	B	A	E	C
95th-Percentile Queue Length [veh]	0.00	0.00	0.06	0.00	1.74	1.74
95th-Percentile Queue Length [ft]	0.00	0.00	1.57	0.00	43.38	43.38
d_A, Approach Delay [s/veh]	0.00		0.09		23.59	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	1.05					
Intersection LOS	E					

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Intersection Level Of Service Report

Intersection 5: Redondo Avenue & Industry Drive

Control Type:	Two-way stop	Delay (sec / veh):	82.1
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.445

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	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	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	150.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	33	1077	38	0	1197	47	31	0	54	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	1.00	0.00	0.00	1.00	0.00	3.00	0.00	0.00	0.00	2.00	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	4	12	46	0	0	0	0	20	0	88
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	1079	42	12	1243	47	31	0	54	20	0	88
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	1.0000	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	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	296	12	3	341	13	9	0	15	5	0	24
Total Analysis Volume [veh/h]	36	1186	46	13	1366	52	34	0	59	22	0	97
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			Yes	Yes
Number of Storage Spaces in Median	0	0	1	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.01	0.00	0.02	0.01	0.00	0.45	0.00	0.15	0.23	0.00	0.22
d_M, Delay for Movement [s/veh]	13.27	0.00	0.00	11.43	0.00	0.00	82.05	72.54	44.34	53.48	0.00	15.53
Movement LOS	B	A	A	B	A	A	F	F	E	F		C
95th-Percentile Queue Length [veh]	0.25	0.00	0.00	0.07	0.00	0.00	3.19	3.19	3.19	0.82	0.00	0.84
95th-Percentile Queue Length [ft]	6.18	0.00	0.00	1.74	0.00	0.00	79.73	79.73	79.73	20.54	0.00	20.90
d_A, Approach Delay [s/veh]	0.38			0.10			58.13			22.54		
Approach LOS	A			A			F			C		
d_I, Intersection Delay [s/veh]	2.99											
Intersection LOS	F											

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Intersection Level Of Service Report
Intersection 6: Redondo Avenue & Hill Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.806

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	70.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	127	958	1172	114	194	228
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	0.00	1.00	1.00	1.00
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	6	66	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]	127	964	1238	114	194	228
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	256	329	30	52	61
Total Analysis Volume [veh/h]	135	1026	1317	121	206	243
Pedestrian Volume [ped/h]	1		0		2	
Bicycle Volume [bicycles/h]	0		3		2	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	2	6	0	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.32	0.45	0.45	0.13	0.15
Intersection LOS	D					
Intersection V/C	0.806					

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Intersection Level Of Service Report
Intersection 7: Redondo Avenue & Stearns Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.730

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	1	1
Pocket Length [ft]	100.00	100.00	110.00	100.00	70.00	70.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	924	197	233	1164	207	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	0.00	1.00	2.00	1.00
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]	5	0	11	55	0	1
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]	929	197	244	1219	207	155
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	244	52	64	321	54	41
Total Analysis Volume [veh/h]	978	207	257	1283	218	163
Pedestrian Volume [ped/h]	0		0		2	
Bicycle Volume [bicycles/h]	0		5		3	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	3	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.37	0.37	0.16	0.40	0.07	0.08
Intersection LOS	C					
Intersection V/C	0.730					

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Intersection Level Of Service Report

Intersection 8: Redondo Avenue & Pacific Coast Highway

Control Type:	Signalized	Delay (sec / veh):	49.3
Analysis Method:	HCM 2010	Level Of Service:	D
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	0	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	200.00	100.00	100.00	150.00	100.00	65.00	160.00	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]	139	705	290	169	813	196	211	1246	17	284	1182	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	1.00	0.00	1.00	1.00	1.00	0.00	2.00	0.00	0.00	2.00	7.00
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	22	11	22	2	0	0	0	0	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]	139	706	290	191	824	218	213	1246	17	284	1182	44
Peak Hour Factor	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	178	73	48	208	55	54	315	4	72	298	11
Total Analysis Volume [veh/h]	140	713	293	193	832	220	215	1259	17	287	1194	44
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	8			18			19			31		
Bicycle Volume [bicycles/h]	2			1			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	64.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	7	4	0	3	8	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	10	0	7	10	0	7	8	0	7	8	0
Maximum Green [s]	20	50	0	20	50	0	20	33	0	20	33	0
Amber [s]	4.0	4.1	0.0	4.0	4.1	0.0	4.0	4.4	0.0	4.0	4.4	0.0
All red [s]	1.0	1.4	0.0	1.0	1.4	0.0	1.0	1.4	0.0	1.0	1.4	0.0
Split [s]	25	39	0	25	39	0	17	39	0	17	39	0
Vehicle Extension [s]	2.5	3.5	0.0	2.5	3.5	0.0	2.5	3.5	0.0	2.5	3.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	6	0
Pedestrian Clearance [s]	0	16	0	0	16	0	0	20	0	0	20	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]	3.0	3.5	0.0	3.0	3.5	0.0	3.0	3.8	0.0	3.0	3.8	0.0
Minimum Recall	No	Yes		No	Yes		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]	5.0	5.0	0.0	5.0	5.0	0.0	5.0	5.0	0.0	5.0	5.0	0.0
Detector Length [ft]	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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]	125	125	125	125	125	125	125	125	125	125	125	125
L, Total Lost Time per Cycle [s]	5.50	5.50	5.50	5.50	5.50	5.50	5.00	5.80	5.80	5.00	5.80	5.80
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	3.50	3.50	0.00	3.50	3.50	3.00	3.80	3.80	3.00	3.80	3.80
g_i, Effective Green Time [s]	56	41	41	56	43	43	17	32	32	20	35	35
g / C, Green / Cycle	0.45	0.33	0.33	0.45	0.35	0.35	0.13	0.26	0.26	0.16	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.16	0.28	0.29	0.22	0.23	0.14	0.12	0.24	0.24	0.16	0.23	0.23
s, saturation flow rate [veh/h]	888	1881	1651	859	3582	1553	1810	3547	1849	1810	3547	1825
c, Capacity [veh/h]	356	616	541	322	1241	538	243	914	477	288	1002	515
d1, Uniform Delay [s]	23.42	39.26	39.74	27.42	34.73	31.06	53.07	45.05	45.05	52.45	41.76	41.79
k, delay calibration	0.13	0.25	0.26	0.50	0.13	0.13	0.20	0.13	0.35	0.38	0.13	0.34
I, Upstream Filtering Factor	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]	0.85	7.68	10.90	8.02	0.77	0.60	17.03	5.02	19.52	45.40	2.02	9.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

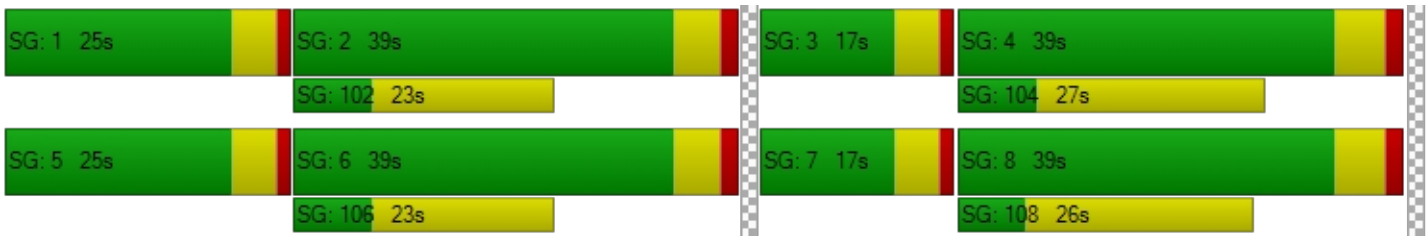
X, volume / capacity	0.39	0.86	0.88	0.60	0.67	0.41	0.88	0.92	0.92	1.00	0.82	0.82
d, Delay for Lane Group [s/veh]	24.27	46.94	50.65	35.44	35.49	31.66	70.09	50.06	64.57	97.85	43.78	51.30
Lane Group LOS	C	D	D	D	D	C	E	D	E	F	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	2.53	16.31	15.38	4.20	10.84	5.16	7.77	13.18	15.67	12.58	11.93	13.38
50th-Percentile Queue Length [ft]	63.28	407.85	384.56	105.06	271.04	128.89	194.16	329.43	391.73	314.50	298.19	334.58
95th-Percentile Queue Length [veh]	4.56	22.94	21.81	7.56	16.24	8.88	12.34	19.13	22.16	18.40	17.59	19.38
95th-Percentile Queue Length [ft]	113.90	573.45	545.36	189.10	406.04	221.99	308.42	478.26	554.02	459.92	439.79	484.58

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.27	47.90	50.65	35.44	35.49	31.66	70.09	54.91	64.57	97.85	46.16	51.30
Movement LOS	C	D	D	D	D	C	E	D	E	F	D	D
d_A, Approach Delay [s/veh]	45.72			34.81			57.21			56.04		
Approach LOS	D			C			E			E		
d_I, Intersection Delay [s/veh]	49.28											
Intersection LOS	D											
Intersection V/C	0.755											

Sequence

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



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Intersection Level Of Service Report

Intersection 9: Grand Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.784

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	0	1	0	0	2	0	1
Pocket Length [ft]	160.00	100.00	100.00	170.00	100.00	100.00	120.00	100.00	100.00	170.00	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			No		

Volumes

Name												
Base Volume Input [veh/h]	44	5	134	94	3	58	74	2093	26	95	1237	60
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	0.00	0.00	2.00	0.00	1.00	4.00	9.00	2.00	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	10	0	0	0	0	101	0	5	11	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	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	5	144	94	3	58	74	2194	26	100	1248	60
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	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	1	38	25	1	15	19	577	7	26	328	16
Total Analysis Volume [veh/h]	46	5	152	99	3	61	78	2309	27	105	1314	63
Pedestrian Volume [ped/h]	0			4			3			0		
Bicycle Volume [bicycles/h]	0			1			2			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	15.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.05	0.05	0.06	0.04	0.04	0.05	0.49	0.49	0.03	0.27	0.04
Intersection LOS	C											
Intersection V/C	0.784											

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Intersection Level Of Service Report
Intersection 10: Grand Avenue & Burnett Street

Control Type:	Two-way stop	Delay (sec / veh):	9.8
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.057

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	90.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	29	29	17	100	21	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	0.00	0.00	12.00	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	5	10	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	29	17	105	31	7
Peak Hour Factor	0.6700	0.6700	0.6700	0.6700	0.6700	0.6700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	11	6	39	12	3
Total Analysis Volume [veh/h]	43	43	25	157	46	10
Pedestrian Volume [ped/h]	0		0		7	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
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	0.00	0.00	0.00	0.06	0.01
d_M, Delay for Movement [s/veh]	7.71	0.00	0.00	0.00	9.76	8.49
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.20	0.20	0.00	0.00	0.18	0.03
95th-Percentile Queue Length [ft]	5.02	5.02	0.00	0.00	4.55	0.73
d_A, Approach Delay [s/veh]	3.86		0.00		9.53	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.67					
Intersection LOS	A					

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Intersection Level Of Service Report
Intersection 11: Lakewood Boulevard & Willow Street

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	2	0	0	2	0	0	2	0	1	2	0	0
Pocket Length [ft]	175.00	100.00	100.00	140.00	100.00	100.00	175.00	100.00	300.00	150.00	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]	198	1042	161	141	1309	278	317	1725	295	188	947	535
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	2.00	3.00	1.00	1.00	4.00	2.00	0.00	1.00	1.00	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	14	29	82	0	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]	198	1042	161	141	1309	292	346	1807	295	188	948	535
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	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	269	41	36	337	75	89	466	76	48	244	138
Total Analysis Volume [veh/h]	204	1074	166	145	1349	301	357	1863	304	194	977	552
Pedestrian Volume [ped/h]	4			6			7			2		
Bicycle Volume [bicycles/h]	2			1			2			2		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.19	0.19	0.05	0.34	0.34	0.11	0.39	0.13	0.06	0.24	0.24
Intersection LOS	F											
Intersection V/C	1.020											

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Intersection Level Of Service Report
Intersection 12: Temple Avenue & Spring Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.731

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	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	150.00	100.00	100.00	130.00	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			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	394	1	122	29	6	11	23	1329	269	66	1467	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00	2.00	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]	29	0	2	0	0	0	0	5	2	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]	423	1	124	29	6	11	23	1334	271	66	1523	3
Peak Hour Factor	1.0000	0.8600	0.8600	0.8600	0.8600	1.0000	1.0000	1.0000	1.0000	0.8600	1.0000	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	106	0	36	8	2	3	6	334	68	19	381	1
Total Analysis Volume [veh/h]	423	1	144	34	7	11	23	1334	271	77	1523	3
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			1			1			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.09	0.09	0.02	0.01	0.01	0.01	0.33	0.33	0.05	0.32	0.32
Intersection LOS	C											
Intersection V/C	0.731											

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Intersection Level Of Service Report
Intersection 13: Temple Avenue & I-405 Northbound Off-Ramps

Control Type:	Signalized	Delay (sec / veh):	10.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.438

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
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	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	459	0	0	295	346	136
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	3.00	4.00	1.00
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]	29	0	0	2	4	2
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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	488	0	0	297	350	138
Peak Hour Factor	0.8600	1.0000	1.0000	0.8600	0.8600	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	142	0	0	86	102	40
Total Analysis Volume [veh/h]	567	0	0	345	407	160
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		1	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	4	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	10	0	0	10	10	0
Maximum Green [s]	30	0	0	30	25	0
Amber [s]	4.4	0.0	0.0	4.4	4.1	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	55	0	0	55	35	0
Vehicle Extension [s]	4.0	0.0	0.0	4.0	4.0	0.0
Walk [s]	7	0	0	0	0	0
Pedestrian Clearance [s]	10	0	0	0	0	0
Rest In Walk	Yes			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.4	0.0	0.0	3.4	3.1	0.0
Minimum Recall	Yes			Yes	No	
Maximum Recall	No			No	No	
Pedestrian Recall	Yes			No	No	
Detector Location [ft]	5.0	0.0	0.0	5.0	5.0	0.0
Detector Length [ft]	20.0	0.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	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	R
C, Cycle Length [s]	42	42	42	42
L, Total Lost Time per Cycle [s]	5.40	5.40	5.10	5.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.10	3.10
g_i, Effective Green Time [s]	17	17	14	14
g / C, Green / Cycle	0.41	0.41	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.18	0.11	0.26	0.11
s, saturation flow rate [veh/h]	3192	3161	1566	1439
c, Capacity [veh/h]	1298	1286	537	493
d1, Uniform Delay [s]	8.97	8.28	12.23	10.18
k, delay calibration	0.15	0.15	0.15	0.15
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.33	0.16	3.14	0.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.44	0.27	0.76	0.32
d, Delay for Lane Group [s/veh]	9.30	8.44	15.37	10.72
Lane Group LOS	A	A	B	B
Critical Lane Group	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	1.44	0.80	3.09	0.93
50th-Percentile Queue Length [ft]	35.97	20.07	77.18	23.27
95th-Percentile Queue Length [veh]	2.59	1.45	5.56	1.68
95th-Percentile Queue Length [ft]	64.75	36.13	138.93	41.89

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	9.30	0.00	0.00	8.44	15.37	10.72
Movement LOS	A			A	B	B
d_A, Approach Delay [s/veh]	9.30		8.44		14.06	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	10.93					
Intersection LOS	B					
Intersection V/C	0.438					

Sequence

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

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Intersection Level Of Service Report

Intersection 14: Temple Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.789

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	0
Pocket Length [ft]	130.00	100.00	100.00	130.00	100.00	100.00	200.00	100.00	100.00	195.00	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]	57	213	46	149	417	238	45	1589	141	41	1271	71
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	2.00	3.00	2.00	1.00	13.00	1.00	1.00	10.00	1.00	6.00
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	6	0	0	0	8	0	0	63	29
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	57	213	46	155	417	238	45	1597	141	41	1334	100
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	57	12	41	111	63	12	425	38	11	355	27
Total Analysis Volume [veh/h]	61	227	49	165	444	253	48	1699	150	44	1419	106
Pedestrian Volume [ped/h]	0			7			2			2		
Bicycle Volume [bicycles/h]	2			2			3			2		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.09	0.09	0.10	0.22	0.22	0.03	0.39	0.39	0.03	0.32	0.32
Intersection LOS	C											
Intersection V/C	0.789											

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Intersection Level Of Service Report

Intersection 15: Cherry Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.933

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	2	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	105.00	175.00	100.00	100.00	245.00	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]	156	851	213	288	904	195	227	1345	134	274	1139	218
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	3.00	0.00	1.00	2.00	1.00	1.00	0.00	1.00	1.00	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	3	0	0	0	5	0	0	34	29
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	156	851	213	291	904	195	227	1350	134	274	1173	247
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	40	219	55	75	233	50	59	348	35	71	302	64
Total Analysis Volume [veh/h]	161	877	220	300	932	201	234	1392	138	282	1209	255
Pedestrian Volume [ped/h]	7			3			8			6		
Bicycle Volume [bicycles/h]	0			4			4			3		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.18	0.05	0.09	0.24	0.24	0.07	0.32	0.32	0.09	0.31	0.31
Intersection LOS	E											
Intersection V/C	0.933											

Generated with PTV VISTRO

Version 5.00-03

Intersection Level Of Service Report

Intersection 16: I-405 Southbound Off-Ramps & Spring Street

Control Type:	Signalized	Delay (sec / veh):	10.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.532

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	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	180.00	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			Yes			Yes			No		

Volumes

Name												
Base Volume Input [veh/h]	0	0	0	423	3	98	0	1298	10	0	1267	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	5.00	0.00	11.00	2.00	1.00	0.00	2.00	1.00	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	6	0	0	0	1	0	0	11	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	429	3	98	0	1299	10	0	1278	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	0.9100	0.9100	1.0000	1.0000	0.9100	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	107	1	27	0	325	3	0	320	0
Total Analysis Volume [veh/h]	0	0	0	429	3	108	0	1299	11	0	1278	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			3			0		
Bicycle Volume [bicycles/h]	0			0			1			1		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	30.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	0	0	0	4	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	0	10	0	0	17	0	0	17	0
Maximum Green [s]	0	0	0	0	30	0	0	50	0	0	50	0
Amber [s]	0.0	0.0	0.0	0.0	4.1	0.0	0.0	4.4	0.0	0.0	4.4	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	0	0	0	35	0	0	55	0	0	55	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	2.5	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Walk [s]	0	0	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	23	0	0	0	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	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	0.0	0.0	0.0	3.1	0.0	0.0	3.4	0.0	0.0	3.4	0.0
Minimum Recall					No			Yes			Yes	
Maximum Recall					No			No			No	
Pedestrian Recall					No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group		L	C	R	C	C	C
C, Cycle Length [s]		51	51	51	51	51	51
L, Total Lost Time per Cycle [s]		5.10	5.10	5.10	5.40	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		3.10	3.10	3.10	3.40	3.40	3.40
g_i, Effective Green Time [s]		10	10	10	30	30	30
g / C, Green / Cycle		0.20	0.20	0.20	0.59	0.59	0.59
(v / s)_i Volume / Saturation Flow Rate		0.14	0.14	0.08	0.39	0.39	0.40
s, saturation flow rate [veh/h]		1551	1630	1309	1693	1687	3224
c, Capacity [veh/h]		316	332	267	1002	999	1909
d1, Uniform Delay [s]		18.86	18.86	17.77	6.98	6.99	7.09
k, delay calibration		0.08	0.08	0.08	0.15	0.15	0.15
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.80	1.72	0.73	1.04	1.05	0.59
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.67	0.67	0.40	0.65	0.66	0.67
d, Delay for Lane Group [s/veh]		20.67	20.58	18.50	8.01	8.04	7.68
Lane Group LOS		C	C	B	A	A	A
Critical Lane Group		Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]		2.22	2.33	1.05	3.42	3.43	3.26
50th-Percentile Queue Length [ft]		55.54	58.16	26.27	85.62	85.86	81.59
95th-Percentile Queue Length [veh]		4.00	4.19	1.89	6.16	6.18	5.87
95th-Percentile Queue Length [ft]		99.98	104.69	47.28	154.11	154.54	146.87

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	20.63	20.58	18.50	0.00	8.03	8.04	0.00	7.68	0.00
Movement LOS				C	C	B		A	A		A	
d_A, Approach Delay [s/veh]	0.00			20.20			8.03			7.68		
Approach LOS	A			C			A			A		
d_I, Intersection Delay [s/veh]	9.99											
Intersection LOS	A											
Intersection V/C	0.532											

Sequence

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

KITTELSON & ASSOCIATES, INC.
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Portland, Oregon 97205
(503) 228-5230

Project #: 21730
Project Name: 2300 Redondo Avenue
Analyst: HXA
Date: 10/16/2017
File: C:\Users\hahmed\Desktop\2300 Redondo Report\Signal Warrants\[21730 Signal Warrant Analysis_Int 4_CumP PM_20171020.xls]Data Input
Intersection: 4. Redondo Avenue/Project Driveway
Scenario: Existing Plus Project AM

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
7:45 AM	8:45 AM	1641	983	0	15
2nd Highest Hour		1553	931	0	14
3rd Highest Hour		1532	917	0	14
4th Highest Hour		1466	878	0	13
5th Highest Hour		1444	865	0	13
6th Highest Hour		1444	865	0	13
7th Highest Hour		1378	826	0	13
8th Highest Hour		1357	813	0	12
9th Highest Hour		1313	786	0	12
10th Highest Hour		1225	734	0	11
11th Highest Hour		1182	708	0	11
12th Highest Hour		1160	695	0	11
13th Highest Hour		1116	668	0	10
14th Highest Hour		963	577	0	9
15th Highest Hour		766	459	0	7
16th Highest Hour		722	433	0	7
17th Highest Hour		503	301	0	5
18th Highest Hour		416	249	0	4
19th Highest Hour		219	131	0	2
20th Highest Hour		153	92	0	1
21st Highest Hour		131	79	0	1
22nd Highest Hour		88	52	0	1
23rd Highest Hour		44	26	0	0
24th Highest Hour		44	26	0	0

Warrant Summary

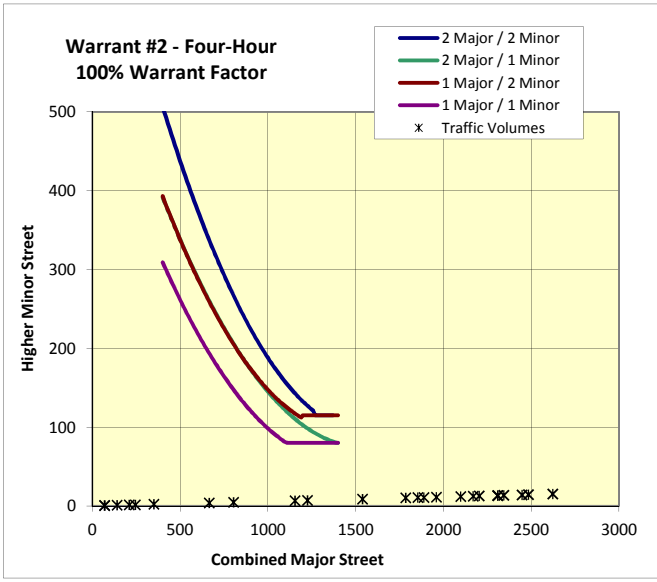
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

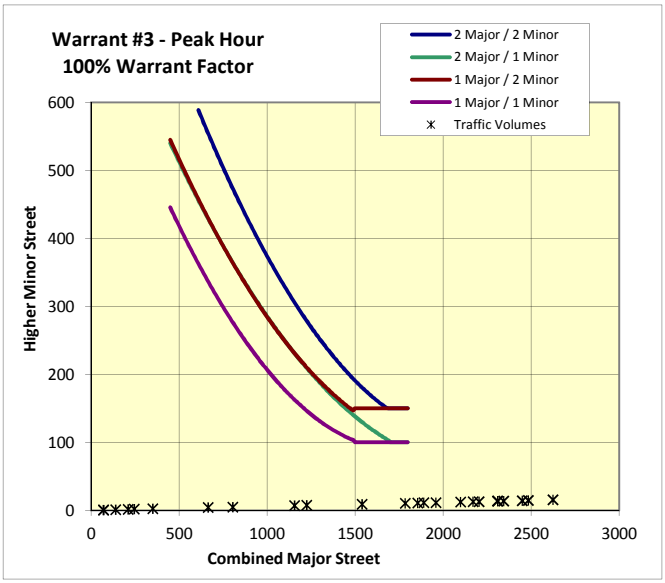
Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	89%
Major Street: 8th-Highest Hour / Peak Hour	83%
Minor Street: 4th-Highest Hour / Peak Hour	89%
Minor Street: 8th-Highest Hour / Peak Hour	83%

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	600	150	0	No	**No**
	B	900	75	0	No	
80%	A	480	120	0	No	**No**
	B	720	60	0	No	
70%	A	420	105	0	No	**No**
	B	630	53	0	No	
56%	A	336	84	0	No	**No**
	B	504	42	0	No	





KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230

Project #: 21730
Project Name: 2300 Redondo Avenue
Analyst: HXA
Date: 10/16/2017
File: C:\Users\hahmed\Desktop\2300 Redondo Report\Signal Warrants\[21730 Signal Warrant Analysis_Int 4_CumP PM_20171020.xls]Data Input
Intersection: 4. Redondo Avenue/Project Driveway
Scenario: Existing Plus Project PM

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
5:00 PM	6:00 PM	1232	1293	0	112
2nd Highest Hour		1166	1224	0	106
3rd Highest Hour		1150	1207	0	105
4th Highest Hour		1101	1155	0	100
5th Highest Hour		1084	1138	0	99
6th Highest Hour		1084	1138	0	99
7th Highest Hour		1035	1086	0	94
8th Highest Hour		1018	1069	0	93
9th Highest Hour		986	1034	0	90
10th Highest Hour		920	965	0	84
11th Highest Hour		887	931	0	81
12th Highest Hour		871	914	0	79
13th Highest Hour		838	879	0	76
14th Highest Hour		723	759	0	66
15th Highest Hour		575	603	0	52
16th Highest Hour		542	569	0	49
17th Highest Hour		378	397	0	34
18th Highest Hour		312	328	0	28
19th Highest Hour		164	172	0	15
20th Highest Hour		115	121	0	10
21st Highest Hour		99	103	0	9
22nd Highest Hour		66	69	0	6
23rd Highest Hour		33	34	0	3
24th Highest Hour		33	34	0	3

Warrant Summary

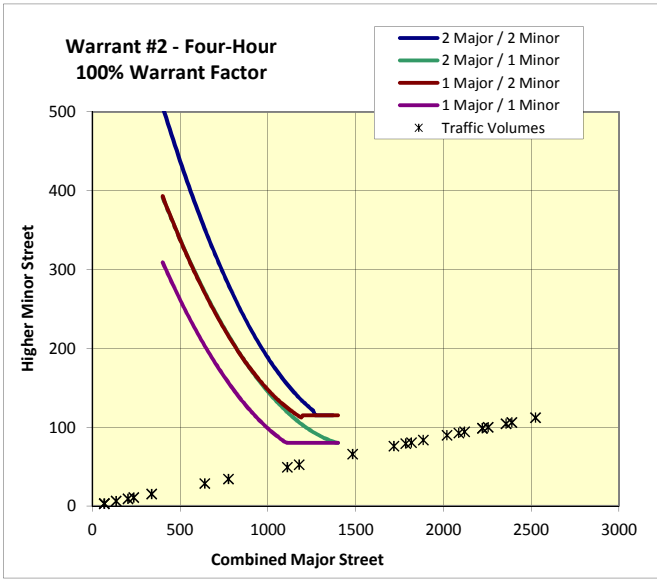
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

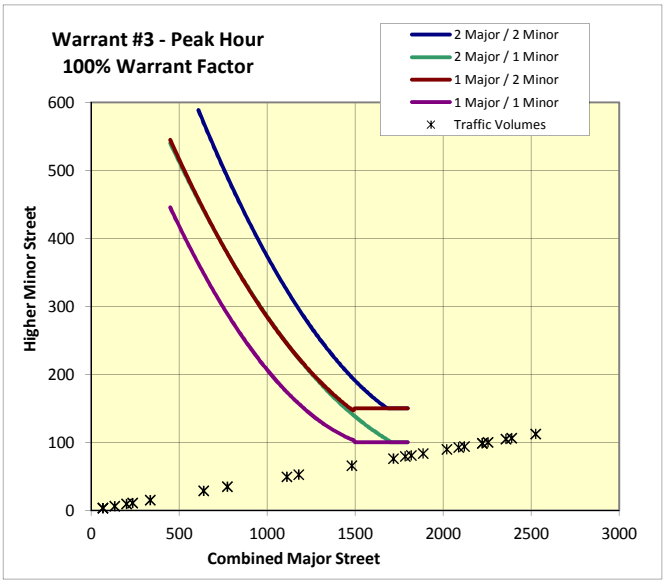
Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	89%
Major Street: 8th-Highest Hour / Peak Hour	83%
Minor Street: 4th-Highest Hour / Peak Hour	89%
Minor Street: 8th-Highest Hour / Peak Hour	83%

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	600	150	0	No	**Yes**
	B	900	75	13	Yes	
80%	A	480	120	0	No	**Yes**
	B	720	60	14	Yes	
70%	A	420	105	3	No	**Yes**
	B	630	53	15	Yes	
56%	A	336	84	10	Yes	**Yes**
	B	504	42	16	Yes	





KITTELSON & ASSOCIATES, INC.
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Portland, Oregon 97205
(503) 228-5230

Project #: 21730
Project Name: 2300 Redondo Avenue
Analyst: HXA
Date: 10/16/2017
File: C:\Users\hahmed\Desktop\2300 Redondo Report\Signal Warrants\[21730 Signal Warrant Analysis_Int 4_CumP PM_20171020.xls]Data Input
Intersection: 5. Redondo Avenue/Industry Drive-Project Di
Scenario: Existing Plus Project AM

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
7:45 AM	8:45 AM	1709	848	45	14
2nd Highest Hour		1618	803	43	13
3rd Highest Hour		1595	791	42	13
4th Highest Hour		1527	758	40	13
5th Highest Hour		1504	746	40	12
6th Highest Hour		1504	746	40	12
7th Highest Hour		1436	712	38	12
8th Highest Hour		1413	701	37	12
9th Highest Hour		1367	678	36	11
10th Highest Hour		1276	633	34	10
11th Highest Hour		1230	611	32	10
12th Highest Hour		1208	599	32	10
13th Highest Hour		1162	577	31	10
14th Highest Hour		1003	497	26	8
15th Highest Hour		798	396	21	7
16th Highest Hour		752	373	20	6
17th Highest Hour		524	260	14	4
18th Highest Hour		433	215	11	4
19th Highest Hour		228	113	6	2
20th Highest Hour		160	79	4	1
21st Highest Hour		137	68	4	1
22nd Highest Hour		91	45	2	1
23rd Highest Hour		46	23	1	0
24th Highest Hour		46	23	1	0

Warrant Summary

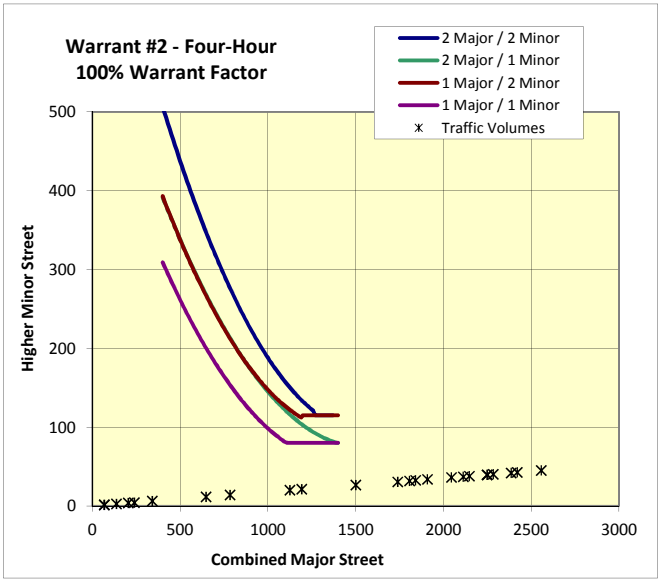
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

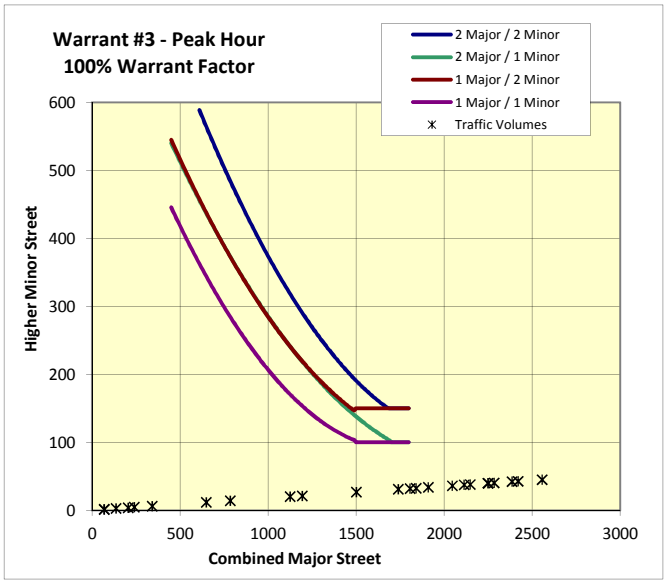
Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	89%
Major Street: 8th-Highest Hour / Peak Hour	83%
Minor Street: 4th-Highest Hour / Peak Hour	89%
Minor Street: 8th-Highest Hour / Peak Hour	83%

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	600	150	0	No	**No**
	B	900	75	0	No	
80%	A	480	120	0	No	**No**
	B	720	60	0	No	
70%	A	420	105	0	No	**No**
	B	630	53	0	No	
56%	A	336	84	0	No	**No**
	B	504	42	3	No	





KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230

Project #: 21730
Project Name: 2300 Redondo Avenue
Analyst: HXA
Date: 10/16/2017
File: C:\Users\hahmed\Desktop\2300 Redondo Report\Signal Warrants\[21730 Signal Warrant Analysis_Int 4_CumP PM_20171020.xls]Data Input
Intersection: 5. Redondo Avenue/Industry Drive-Project Di
Scenario: Existing Plus Project PM

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
5:00 PM	6:00 PM	1154	1302	85	108
2nd Highest Hour		1092	1233	80	102
3rd Highest Hour		1077	1215	79	101
4th Highest Hour		1031	1163	76	96
5th Highest Hour		1016	1146	75	95
6th Highest Hour		1016	1146	75	95
7th Highest Hour		969	1094	71	91
8th Highest Hour		954	1076	70	89
9th Highest Hour		923	1042	68	86
10th Highest Hour		862	972	63	81
11th Highest Hour		831	937	61	78
12th Highest Hour		815	920	60	76
13th Highest Hour		785	885	58	73
14th Highest Hour		677	764	50	63
15th Highest Hour		539	608	40	50
16th Highest Hour		508	573	37	48
17th Highest Hour		354	399	26	33
18th Highest Hour		292	330	22	27
19th Highest Hour		154	174	11	14
20th Highest Hour		108	122	8	10
21st Highest Hour		92	104	7	9
22nd Highest Hour		62	69	5	6
23rd Highest Hour		31	35	2	3
24th Highest Hour		31	35	2	3

Warrant Summary

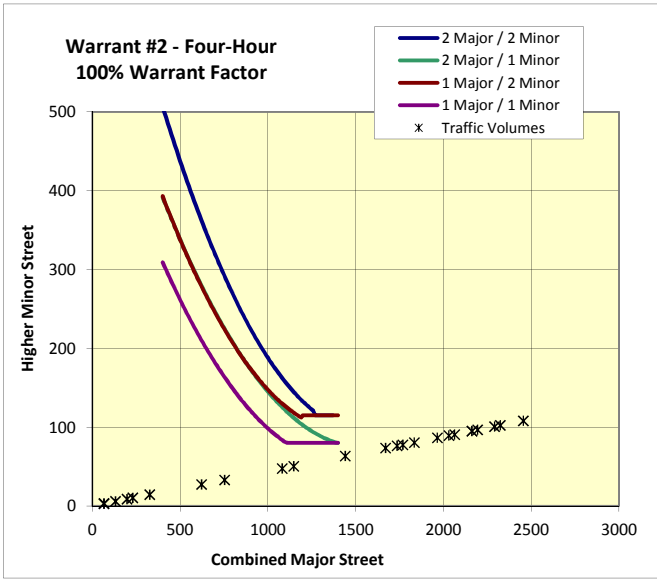
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

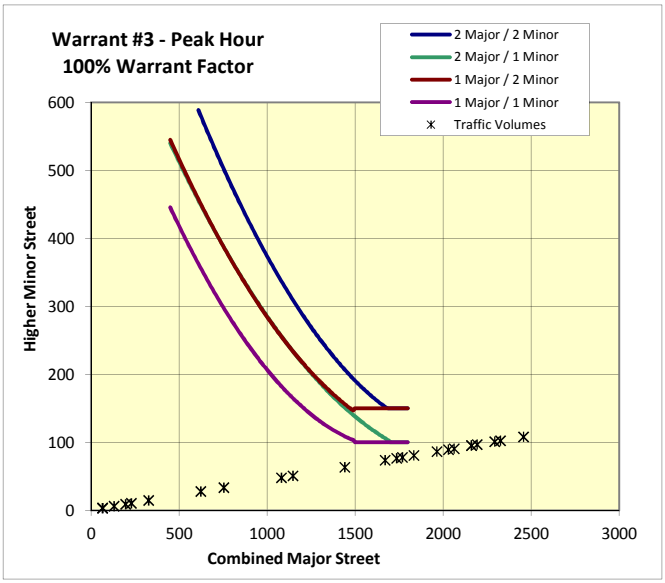
Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	89%
Major Street: 8th-Highest Hour / Peak Hour	83%
Minor Street: 4th-Highest Hour / Peak Hour	89%
Minor Street: 8th-Highest Hour / Peak Hour	83%

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	600	150	0	No	**Yes**
	B	900	75	12	Yes	
80%	A	480	120	0	No	**Yes**
	B	720	60	14	Yes	
70%	A	420	105	1	No	**Yes**
	B	630	53	14	Yes	
56%	A	336	84	9	Yes	**Yes**
	B	504	42	16	Yes	





Appendix E

LOS Worksheets – Cumulative (2019) Conditions

Generated with PTV VISTRO

Version 5.00-03

Intersection Level Of Service Report

Intersection 1: Redondo Avenue & Spring Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.761

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	0	0	0	0	1	0	0	2	0	0
Pocket Length [ft]	250.00	100.00	100.00	100.00	100.00	100.00	120.00	100.00	100.00	220.00	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]	546	2	292	5	2	1	3	744	345	320	1322	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 [%]	1.00	0.00	1.00	0.00	0.00	0.00	0.00	3.00	2.00	3.00	1.00	10.00
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]	546	2	292	5	2	1	3	744	345	320	1322	10
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	150	1	80	1	1	0	1	204	95	88	363	3
Total Analysis Volume [veh/h]	600	2	321	5	2	1	3	818	379	352	1453	11
Pedestrian Volume [ped/h]	0			1			0			0		
Bicycle Volume [bicycles/h]	1			0			1			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.19	0.10	0.10	0.00	0.00	0.00	0.00	0.25	0.25	0.11	0.31	0.31
Intersection LOS	C											
Intersection V/C	0.761											

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Intersection Level Of Service Report
Intersection 2: Redondo Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.818

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	2	0	1	2	0	0	1	0	1	2	0	1
Pocket Length [ft]	175.00	100.00	150.00	145.00	100.00	100.00	190.00	100.00	190.00	160.00	100.00	160.00
Speed [mph]	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]	259	948	474	110	365	49	120	1040	162	200	1348	281
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	1.00	11.00	2.00	4.00	2.00	3.00	7.00	5.00	2.00	3.00
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]	259	948	474	110	365	49	120	1040	162	200	1348	281
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	69	252	126	29	97	13	32	277	43	53	359	75
Total Analysis Volume [veh/h]	276	1009	504	117	388	52	128	1106	172	213	1434	299
Pedestrian Volume [ped/h]	5			3			0			2		
Bicycle Volume [bicycles/h]	3			0			1			0		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.21	0.25	0.04	0.09	0.09	0.08	0.23	0.11	0.07	0.30	0.19
Intersection LOS	D											
Intersection V/C	0.818											

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Intersection Level Of Service Report
Intersection 3: Redondo Avenue & Burnett Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.701

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1
Pocket Length [ft]	100.00	100.00	120.00	100.00	100.00	140.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	1554	86	32	803	30	23
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	0.00	4.00	10.00	17.00
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]	1554	86	32	803	30	23
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	409	23	8	211	8	6
Total Analysis Volume [veh/h]	1636	91	34	845	32	24
Pedestrian Volume [ped/h]	0		6		0	
Bicycle Volume [bicycles/h]	4		0		0	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	3	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.54	0.54	0.02	0.26	0.02	0.02
Intersection LOS	C					
Intersection V/C	0.701					

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Intersection Level Of Service Report
Intersection 4: Redondo Avenue & Project Driveway

Control Type:	Two-way stop	Delay (sec / veh):	42.3
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.140

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	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	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	1617	0	0	836	15	32
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	0.00	0.00	3.00	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]	1617	0	0	836	15	32
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	421	0	0	218	4	8
Total Analysis Volume [veh/h]	1684	0	0	871	16	33
Pedestrian Volume [ped/h]	0		0		1	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.01	0.14	0.11
d_M, Delay for Movement [s/veh]	0.00	0.00	14.37	0.00	42.29	22.38
Movement LOS	A	A	B	A	E	C
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.93	0.93
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	23.32	23.32
d_A, Approach Delay [s/veh]	0.00		0.00		28.88	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	0.54					
Intersection LOS	E					

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Intersection Level Of Service Report

Intersection 5: Redondo Avenue & Industry Drive

Control Type:	Two-way stop	Delay (sec / veh):	75.0
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.177

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	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	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	150.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	46	1602	28	42	719	57	20	0	26	11	0	29
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	0.00	2.00	3.00	2.00	15.00	0.00	4.00	0.00	2.00	4.00
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]	46	1602	28	42	719	57	20	0	26	11	0	29
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	1.0000	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	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	413	7	11	185	15	5	0	7	3	0	7
Total Analysis Volume [veh/h]	47	1652	29	43	741	59	21	0	27	11	0	30
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			Yes	Yes
Number of Storage Spaces in Median	0	0	1	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.02	0.00	0.11	0.01	0.00	0.20	0.00	0.05	0.18	0.00	0.10
d_M, Delay for Movement [s/veh]	9.66	0.00	0.00	15.78	0.00	0.00	45.55	72.88	17.04	74.95	0.00	18.12
Movement LOS	A	A	A	C	A	A	E	F	C	F		C
95th-Percentile Queue Length [veh]	0.18	0.00	0.00	0.38	0.00	0.00	0.94	0.94	0.94	0.59	0.00	0.33
95th-Percentile Queue Length [ft]	4.56	0.00	0.00	9.57	0.00	0.00	23.42	23.42	23.42	14.76	0.00	8.13
d_A, Approach Delay [s/veh]	0.26			0.80			29.51			33.37		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	1.47											
Intersection LOS	F											

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Intersection Level Of Service Report
Intersection 6: Redondo Avenue & Hill Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.746

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	70.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	142	1433	677	75	245	152
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	1.00	3.00	0.00	0.00	1.00
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]	142	1433	677	75	245	152
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	373	176	20	64	40
Total Analysis Volume [veh/h]	148	1493	705	78	255	158
Pedestrian Volume [ped/h]	0		0		7	
Bicycle Volume [bicycles/h]	5		0		1	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	2	6	0	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.47	0.24	0.24	0.16	0.10
Intersection LOS	C					
Intersection V/C	0.746					

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Intersection Level Of Service Report

Intersection 7: Redondo Avenue & Stearns Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.770

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	1	1
Pocket Length [ft]	100.00	100.00	110.00	100.00	70.00	70.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	1379	154	120	712	220	182
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	3.00	3.00	3.00	0.00	2.00
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]	1379	154	120	712	220	182
Peak Hour Factor	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	352	39	31	182	56	46
Total Analysis Volume [veh/h]	1407	157	122	727	224	186
Pedestrian Volume [ped/h]	0		0		1	
Bicycle Volume [bicycles/h]	3		2		2	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	3	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.49	0.49	0.08	0.23	0.07	0.09
Intersection LOS	C					
Intersection V/C	0.770					

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Intersection Level Of Service Report
Intersection 8: Redondo Avenue & Pacific Coast Highway

Control Type:	Signalized	Delay (sec / veh):	60.7
Analysis Method:	HCM 2010	Level Of Service:	E
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	1	1	0	0	1	0	0
Pocket Length [ft]	200.00	100.00	100.00	150.00	100.00	65.00	160.00	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]	131	977	240	90	435	153	225	1053	10	236	1344	63
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	1.00	1.00	2.00	3.00	5.00	2.00	2.00	0.00	2.00	3.00	3.00
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]	131	977	240	90	435	153	225	1053	10	236	1344	63
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	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	252	62	23	112	39	58	271	3	61	346	16
Total Analysis Volume [veh/h]	135	1007	247	93	448	158	232	1086	10	243	1386	65
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	5			6			8			16		
Bicycle Volume [bicycles/h]	3			1			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	47.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	7	4	0	3	8	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	10	0	7	10	0	7	8	0	7	8	0
Maximum Green [s]	20	50	0	20	50	0	20	33	0	20	33	0
Amber [s]	4.0	4.1	0.0	4.0	4.1	0.0	4.0	4.4	0.0	4.0	4.4	0.0
All red [s]	1.0	1.4	0.0	1.0	1.4	0.0	1.0	1.4	0.0	1.0	1.4	0.0
Split [s]	25	42	0	25	42	0	17	36	0	17	36	0
Vehicle Extension [s]	2.5	3.5	0.0	2.5	3.5	0.0	2.5	3.5	0.0	2.5	3.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	6	0
Pedestrian Clearance [s]	0	16	0	0	16	0	0	20	0	0	20	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]	3.0	3.5	0.0	3.0	3.5	0.0	3.0	3.8	0.0	3.0	3.8	0.0
Minimum Recall	No	Yes		No	Yes		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]	5.0	5.0	0.0	5.0	5.0	0.0	5.0	5.0	0.0	5.0	5.0	0.0
Detector Length [ft]	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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]	128	128	128	128	128	128	128	128	128	128	128	128
L, Total Lost Time per Cycle [s]	5.50	5.50	5.50	5.50	5.50	5.50	5.00	5.80	5.80	5.00	5.80	5.80
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	3.50	3.50	0.00	3.50	3.50	3.00	3.80	3.80	3.00	3.80	3.80
g_i, Effective Green Time [s]	60	48	48	60	47	47	19	32	32	19	33	33
g / C, Green / Cycle	0.47	0.38	0.38	0.47	0.37	0.37	0.15	0.25	0.25	0.15	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.12	0.34	0.35	0.14	0.13	0.10	0.13	0.20	0.20	0.14	0.27	0.27
s, saturation flow rate [veh/h]	1101	1881	1735	660	3512	1509	1774	3547	1854	1774	3512	1801
c, Capacity [veh/h]	513	708	652	244	1292	555	258	895	468	268	907	465
d1, Uniform Delay [s]	20.14	37.84	38.33	27.99	29.25	28.51	53.69	44.80	44.80	53.34	47.39	47.39
k, delay calibration	0.13	0.37	0.38	0.32	0.13	0.13	0.27	0.13	0.28	0.30	0.13	0.46
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.33	14.14	18.33	2.85	0.19	0.34	22.55	2.10	8.15	24.52	33.09	56.59
d3, Initial Queue 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

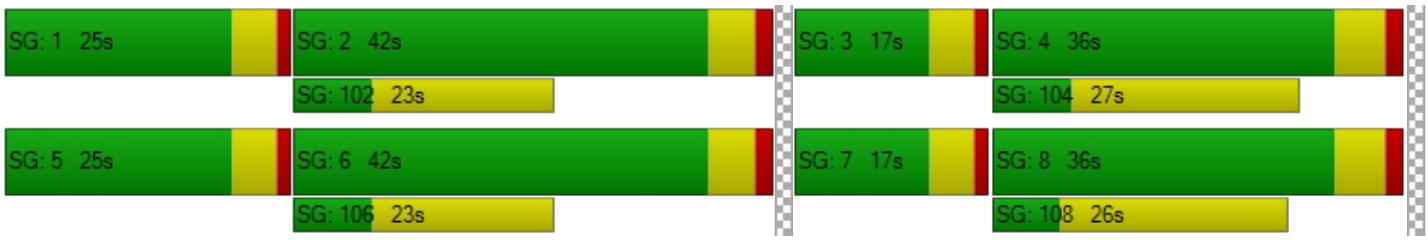
X, volume / capacity	0.26	0.91	0.93	0.38	0.35	0.28	0.90	0.80	0.80	0.91	1.06	1.06
d, Delay for Lane Group [s/veh]	20.46	51.98	56.66	30.85	29.44	28.84	76.23	46.90	52.95	77.86	80.48	103.98
Lane Group LOS	C	D	E	C	C	C	E	D	D	E	F	F
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	2.38	21.65	21.38	1.76	5.05	3.50	8.93	10.92	12.20	9.49	18.48	21.98
50th-Percentile Queue Length [ft]	59.42	541.32	534.61	44.00	126.21	87.45	223.33	273.02	305.12	237.21	461.90	549.52
95th-Percentile Queue Length [veh]	4.28	29.28	28.97	3.17	8.73	6.30	13.83	16.34	17.93	14.54	26.39	30.72
95th-Percentile Queue Length [ft]	106.96	732.10	724.21	79.20	218.32	157.41	345.87	408.51	448.35	363.51	659.65	768.08

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	20.46	53.66	56.66	30.85	29.44	28.84	76.23	48.94	52.95	77.86	87.73	103.98
Movement LOS	C	D	E	C	C	C	E	D	D	E	F	F
d_A, Approach Delay [s/veh]	50.97			29.49			53.74			86.94		
Approach LOS	D			C			D			F		
d_I, Intersection Delay [s/veh]	60.67											
Intersection LOS	E											
Intersection V/C	0.787											

Sequence

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



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Intersection Level Of Service Report

Intersection 9: Grand Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.658

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	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	2	0	1
Pocket Length [ft]	160.00	100.00	100.00	170.00	100.00	100.00	120.00	100.00	100.00	170.00	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			No		

Volumes

Name												
Base Volume Input [veh/h]	21	3	20	29	4	41	72	1319	72	217	1876	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 [%]	14.00	0.00	25.00	0.00	0.00	3.00	1.00	3.00	3.00	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
Total Hourly Volume [veh/h]	21	3	20	29	4	41	72	1319	72	217	1876	116
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	1	5	8	1	11	19	351	19	58	499	31
Total Analysis Volume [veh/h]	22	3	21	31	4	44	77	1403	77	231	1996	123
Pedestrian Volume [ped/h]	0			9			10			0		
Bicycle Volume [bicycles/h]	0			0			2			1		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	15.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.02	0.03	0.03	0.05	0.31	0.31	0.07	0.42	0.08
Intersection LOS	B											
Intersection V/C	0.658											

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Intersection Level Of Service Report
Intersection 10: Grand Avenue & Burnett Street

Control Type:	Two-way stop	Delay (sec / veh):	9.1
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.051

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	90.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	7	5	44	68	42	24
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	43.00	20.00	2.00	1.00	0.00	4.00
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]	7	5	44	68	42	24
Peak Hour Factor	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	1	12	19	12	7
Total Analysis Volume [veh/h]	8	6	49	76	47	27
Pedestrian Volume [ped/h]	0		0		5	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
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	0.00	0.00	0.00	0.05	0.03
d_M, Delay for Movement [s/veh]	7.94	0.00	0.00	0.00	9.12	8.69
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.03	0.03	0.00	0.00	0.16	0.08
95th-Percentile Queue Length [ft]	0.86	0.86	0.00	0.00	4.02	2.07
d_A, Approach Delay [s/veh]	4.54		0.00		8.96	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.41					
Intersection LOS	A					

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Intersection Level Of Service Report

Intersection 11: Lakewood Boulevard & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.112

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	0	2	0	1	2	0	0
Pocket Length [ft]	175.00	100.00	100.00	140.00	100.00	100.00	175.00	100.00	300.00	150.00	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]	298	1363	211	107	1264	511	203	1119	137	100	1439	809
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	1.00	1.00	0.00	2.00	3.00	5.00	3.00	4.00	4.00	1.00	1.00
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]	298	1363	211	107	1264	511	203	1119	137	100	1439	809
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	80	366	57	29	340	137	55	301	37	27	387	217
Total Analysis Volume [veh/h]	320	1466	227	115	1359	549	218	1203	147	108	1547	870
Pedestrian Volume [ped/h]	6			5			5			1		
Bicycle Volume [bicycles/h]	0			0			0			2		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.26	0.26	0.04	0.40	0.40	0.07	0.25	0.00	0.03	0.38	0.38
Intersection LOS	F											
Intersection V/C	1.112											

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Intersection Level Of Service Report

Intersection 12: Temple Avenue & Spring Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.696

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	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	150.00	100.00	100.00	130.00	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			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	404	17	100	3	2	4	34	1097	245	115	1683	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	6.00	3.00	0.00	0.00	0.00	6.00	3.00	3.00	4.00	1.00	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]	404	17	100	3	2	4	34	1097	245	115	1683	3
Peak Hour Factor	1.0000	0.8900	0.8900	0.8900	0.8900	1.0000	1.0000	1.0000	1.0000	0.8900	1.0000	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	101	5	28	1	1	1	9	274	61	32	421	1
Total Analysis Volume [veh/h]	404	19	112	3	2	4	34	1097	245	129	1683	3
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			4			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.08	0.08	0.00	0.00	0.00	0.02	0.28	0.28	0.08	0.35	0.35
Intersection LOS	B											
Intersection V/C	0.696											

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Intersection Level Of Service Report
Intersection 13: Temple Avenue & I-405 Northbound Off-Ramps

Control Type:	Signalized	Delay (sec / veh):	9.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.310

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
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	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	385	0	0	353	238	130
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.00	2.00	2.00	2.00	5.00	5.00
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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	385	0	0	353	238	130
Peak Hour Factor	0.8900	1.0000	1.0000	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	108	0	0	99	67	37
Total Analysis Volume [veh/h]	433	0	0	397	267	146
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	2		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	4	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	10	0	0	10	10	0
Maximum Green [s]	30	0	0	30	25	0
Amber [s]	4.4	0.0	0.0	4.4	4.1	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	55	0	0	55	35	0
Vehicle Extension [s]	4.0	0.0	0.0	4.0	4.0	0.0
Walk [s]	7	0	0	0	0	0
Pedestrian Clearance [s]	10	0	0	0	0	0
Rest In Walk	Yes			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.4	0.0	0.0	3.4	3.1	0.0
Minimum Recall	Yes			Yes	No	
Maximum Recall	No			No	No	
Pedestrian Recall	Yes			No	No	
Detector Location [ft]	5.0	0.0	0.0	5.0	5.0	0.0
Detector Length [ft]	20.0	0.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	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	R
C, Cycle Length [s]	37	37	37	37
L, Total Lost Time per Cycle [s]	5.40	5.40	5.10	5.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.10	3.10
g_i, Effective Green Time [s]	17	17	10	10
g / C, Green / Cycle	0.45	0.45	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.14	0.12	0.17	0.11
s, saturation flow rate [veh/h]	3131	3192	1551	1384
c, Capacity [veh/h]	1423	1451	412	368
d1, Uniform Delay [s]	6.48	6.38	12.22	11.31
k, delay calibration	0.15	0.15	0.15	0.15
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.17	0.14	2.44	0.99
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.30	0.27	0.65	0.40
d, Delay for Lane Group [s/veh]	6.65	6.52	14.65	12.30
Lane Group LOS	A	A	B	B
Critical Lane Group	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	0.73	0.66	1.81	0.88
50th-Percentile Queue Length [ft]	18.35	16.52	45.37	21.95
95th-Percentile Queue Length [veh]	1.32	1.19	3.27	1.58
95th-Percentile Queue Length [ft]	33.03	29.74	81.66	39.52

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	6.65	0.00	0.00	6.52	14.65	12.30
Movement LOS	A			A	B	B
d_A, Approach Delay [s/veh]	6.65		6.52		13.82	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	8.99					
Intersection LOS	A					
Intersection V/C	0.310					

Sequence

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

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Intersection Level Of Service Report
Intersection 14: Temple Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.673

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	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]	130.00	100.00	100.00	130.00	100.00	100.00	200.00	100.00	100.00	195.00	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]	94	355	73	62	196	141	65	1188	83	30	1468	83
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	9.00	1.00	8.00	11.00	4.00	6.00	0.00	2.00	2.00	0.00	2.00	5.00
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]	94	355	73	62	196	141	65	1188	83	30	1468	83
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	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	91	19	16	51	36	17	306	21	8	378	21
Total Analysis Volume [veh/h]	97	366	75	64	202	145	67	1225	86	31	1513	86
Pedestrian Volume [ped/h]	1			0			2			2		
Bicycle Volume [bicycles/h]	3			0			2			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.14	0.14	0.04	0.11	0.11	0.04	0.27	0.27	0.02	0.33	0.33
Intersection LOS	B											
Intersection V/C	0.673											

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Intersection Level Of Service Report
Intersection 15: Cherry Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.876

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	2	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	105.00	175.00	100.00	100.00	245.00	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]	159	1060	206	214	867	149	208	966	96	223	1166	134
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	2.00	1.00	3.00	3.00	1.00	1.00	2.00	5.00	4.00	3.00	4.00
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]	159	1060	206	214	867	149	208	966	96	223	1166	134
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	282	55	57	231	40	55	257	26	59	310	36
Total Analysis Volume [veh/h]	169	1128	219	228	922	159	221	1028	102	237	1240	143
Pedestrian Volume [ped/h]	3			5			11			3		
Bicycle Volume [bicycles/h]	1			0			2			1		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.24	0.06	0.07	0.23	0.23	0.07	0.24	0.24	0.07	0.29	0.29
Intersection LOS	D											
Intersection V/C	0.876											

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Intersection Level Of Service Report

Intersection 16: I-405 Southbound Off-Ramps & Spring Street

Control Type:	Signalized	Delay (sec / veh):	20.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.694

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	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	180.00	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			Yes			Yes			No		

Volumes

Name												
Base Volume Input [veh/h]	0	0	0	697	2	260	0	1109	4	0	1522	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	0.00	3.00	2.00	4.00	25.00	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]	0	0	0	697	2	260	0	1109	4	0	1522	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	174	1	72	0	277	1	0	381	0
Total Analysis Volume [veh/h]	0	0	0	697	2	289	0	1109	4	0	1522	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			1			0			0		
Bicycle Volume [bicycles/h]	0			0			3			1		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	15.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	0	0	0	4	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	0	10	0	0	17	0	0	17	0
Maximum Green [s]	0	0	0	0	30	0	0	50	0	0	50	0
Amber [s]	0.0	0.0	0.0	0.0	4.1	0.0	0.0	4.4	0.0	0.0	4.4	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	0	0	0	35	0	0	55	0	0	55	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	2.5	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Walk [s]	0	0	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	23	0	0	0	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	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	0.0	0.0	0.0	3.1	0.0	0.0	3.4	0.0	0.0	3.4	0.0
Minimum Recall					No			Yes			Yes	
Maximum Recall					No			No			No	
Pedestrian Recall					Yes			No			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group		L	C	R	C	C	C
C, Cycle Length [s]		89	89	89	89	89	89
L, Total Lost Time per Cycle [s]		5.10	5.10	5.10	5.40	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		3.10	3.10	3.10	3.40	3.40	3.40
g_i, Effective Green Time [s]		30	30	30	48	48	48
g / C, Green / Cycle		0.34	0.34	0.34	0.54	0.54	0.54
(v / s)_i Volume / Saturation Flow Rate		0.22	0.22	0.20	0.34	0.34	0.48
s, saturation flow rate [veh/h]		1597	1629	1411	1644	1642	3192
c, Capacity [veh/h]		540	551	477	893	892	1735
d1, Uniform Delay [s]		24.80	24.80	24.42	13.98	13.99	17.67
k, delay calibration		0.15	0.15	0.12	0.20	0.20	0.15
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.74	1.70	1.39	1.30	1.31	2.20
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.64	0.64	0.61	0.62	0.62	0.88
d, Delay for Lane Group [s/veh]		26.54	26.50	25.82	15.28	15.30	19.87
Lane Group LOS		C	C	C	B	B	B
Critical Lane Group		Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]		6.18	6.30	5.06	7.36	7.37	12.70
50th-Percentile Queue Length [ft]		154.58	157.52	126.40	184.01	184.19	317.47
95th-Percentile Queue Length [veh]		10.26	10.42	8.74	11.81	11.82	18.54
95th-Percentile Queue Length [ft]		256.53	260.44	218.59	295.24	295.48	463.57

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	26.52	26.50	25.82	0.00	15.29	15.30	0.00	19.87	0.00
Movement LOS				C	C	C		B	B		B	
d_A, Approach Delay [s/veh]	0.00			26.31			15.29			19.87		
Approach LOS	A			C			B			B		
d_I, Intersection Delay [s/veh]	20.22											
Intersection LOS	C											
Intersection V/C	0.694											

Sequence

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

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Intersection Level Of Service Report

Intersection 1: Redondo Avenue & Spring Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.849

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	1	0	0	2	0	0
Pocket Length [ft]	250.00	100.00	100.00	100.00	100.00	100.00	120.00	100.00	100.00	220.00	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]	566	0	387	5	3	3	9	1107	396	242	912	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	20.00	0.00	0.00	22.00	1.00	3.00	3.00	1.00	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]	566	0	387	5	3	3	9	1107	396	242	912	5
Peak Hour Factor	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	159	0	109	1	1	1	3	311	111	68	256	1
Total Analysis Volume [veh/h]	636	0	435	6	3	3	10	1244	445	272	1025	6
Pedestrian Volume [ped/h]	0			1			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.20	0.00	0.14	0.00	0.00	0.00	0.01	0.35	0.35	0.09	0.21	0.21
Intersection LOS	D											
Intersection V/C	0.849											

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Intersection Level Of Service Report
Intersection 2: Redondo Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.882

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	0	1	0	1	2	0	1
Pocket Length [ft]	175.00	100.00	150.00	145.00	100.00	100.00	190.00	100.00	190.00	160.00	100.00	160.00
Speed [mph]	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]	213	595	416	276	654	126	69	1551	291	252	1051	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.00	1.00	1.00	1.00	2.00	6.00	3.00	1.00	1.00	1.00	1.00	4.00
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]	213	595	416	276	654	126	69	1551	291	252	1051	124
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	57	158	111	73	174	34	18	413	77	67	280	33
Total Analysis Volume [veh/h]	227	633	443	294	696	134	73	1650	310	268	1118	132
Pedestrian Volume [ped/h]	4			4			2			2		
Bicycle Volume [bicycles/h]	0			1			3			1		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.13	0.19	0.09	0.17	0.17	0.05	0.34	0.19	0.08	0.23	0.08
Intersection LOS	D											
Intersection V/C	0.882											

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Intersection Level Of Service Report
Intersection 3: Redondo Avenue & Burnett Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.610

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1
Pocket Length [ft]	100.00	100.00	120.00	100.00	100.00	140.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	1175	39	10	1214	105	53
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	1.00	2.00	21.00
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]	1175	39	10	1214	105	53
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	319	11	3	330	29	14
Total Analysis Volume [veh/h]	1277	42	11	1320	114	58
Pedestrian Volume [ped/h]	0		2		0	
Bicycle Volume [bicycles/h]	0		2		1	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	3	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.41	0.41	0.01	0.41	0.07	0.04
Intersection LOS	B					
Intersection V/C	0.610					

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Intersection Level Of Service Report
Intersection 4: Redondo Avenue & Project Driveway

Control Type:	Two-way stop	Delay (sec / veh):	29.0
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.065

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	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	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	1165	0	0	1272	10	63
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	0.00	0.00	1.00	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]	1165	0	0	1272	10	63
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	310	0	0	338	3	17
Total Analysis Volume [veh/h]	1239	0	0	1353	11	67
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.01	0.06	0.15
d_M, Delay for Movement [s/veh]	0.00	0.00	11.33	0.00	29.02	16.05
Movement LOS	A	A	B	A	D	C
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.82	0.82
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	20.49	20.49
d_A, Approach Delay [s/veh]	0.00		0.00		17.88	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.52					
Intersection LOS	D					

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Intersection Level Of Service Report

Intersection 5: Redondo Avenue & Industry Drive

Control Type:	Two-way stop	Delay (sec / veh):	73.3
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.417

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	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	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	150.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	34	1099	39	19	1221	48	32	0	55	35	0	52
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	1.00	0.00	0.00	1.00	0.00	3.00	0.00	0.00	0.00	2.00	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	1099	39	19	1221	48	32	0	55	35	0	52
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	1.0000	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	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	302	11	5	335	13	9	0	15	10	0	14
Total Analysis Volume [veh/h]	37	1208	43	21	1342	53	35	0	60	38	0	57
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			Yes	Yes
Number of Storage Spaces in Median	0	0	1	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.01	0.00	0.04	0.01	0.00	0.42	0.00	0.15	0.41	0.00	0.13
d_M, Delay for Movement [s/veh]	13.11	0.00	0.00	11.64	0.00	0.00	73.33	69.83	39.76	69.29	0.00	14.59
Movement LOS	B	A	A	B	A	A	F	F	E	F		B
95th-Percentile Queue Length [veh]	0.25	0.00	0.00	0.12	0.00	0.00	2.99	2.99	2.99	1.69	0.00	0.45
95th-Percentile Queue Length [ft]	6.22	0.00	0.00	2.90	0.00	0.00	74.81	74.81	74.81	42.23	0.00	11.28
d_A, Approach Delay [s/veh]	0.38			0.17			52.13			36.47		
Approach LOS	A			A			F			E		
d_I, Intersection Delay [s/veh]	3.16											
Intersection LOS	F											

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Intersection Level Of Service Report
Intersection 6: Redondo Avenue & Hill Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.797

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	70.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	130	977	1195	116	198	233
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	0.00	1.00	1.00	1.00
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]	130	977	1195	116	198	233
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	260	318	31	53	62
Total Analysis Volume [veh/h]	138	1039	1271	123	211	248
Pedestrian Volume [ped/h]	1		0		2	
Bicycle Volume [bicycles/h]	0		3		2	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	2	6	0	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.32	0.44	0.44	0.13	0.16
Intersection LOS	C					
Intersection V/C	0.797					

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Intersection Level Of Service Report

Intersection 7: Redondo Avenue & Stearns Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.734

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	1	1
Pocket Length [ft]	100.00	100.00	110.00	100.00	70.00	70.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	942	201	238	1187	211	157
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	0.00	1.00	2.00	1.00
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]	942	201	238	1187	211	157
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	248	53	63	312	56	41
Total Analysis Volume [veh/h]	992	212	251	1249	222	165
Pedestrian Volume [ped/h]	0		0		2	
Bicycle Volume [bicycles/h]	0		5		3	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	3	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.38	0.38	0.16	0.39	0.07	0.08
Intersection LOS	C					
Intersection V/C	0.734					

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Version 5.00-03

Intersection Level Of Service Report
Intersection 8: Redondo Avenue & Pacific Coast Highway

Control Type:	Signalized	Delay (sec / veh):	50.2
Analysis Method:	HCM 2010	Level Of Service:	D
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	0	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	200.00	100.00	100.00	150.00	100.00	65.00	160.00	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]	142	719	296	172	829	200	215	1271	17	290	1206	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 [%]	1.00	1.00	0.00	1.00	1.00	1.00	0.00	2.00	0.00	0.00	2.00	7.00
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]	142	719	296	172	829	200	215	1271	17	290	1206	43
Peak Hour Factor	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	182	75	43	209	51	54	321	4	73	305	11
Total Analysis Volume [veh/h]	143	726	299	174	837	202	217	1284	17	293	1218	43
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	8			18			19			31		
Bicycle Volume [bicycles/h]	2			1			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	64.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	7	4	0	3	8	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	10	0	7	10	0	7	8	0	7	8	0
Maximum Green [s]	20	50	0	20	50	0	20	33	0	20	33	0
Amber [s]	4.0	4.1	0.0	4.0	4.1	0.0	4.0	4.4	0.0	4.0	4.4	0.0
All red [s]	1.0	1.4	0.0	1.0	1.4	0.0	1.0	1.4	0.0	1.0	1.4	0.0
Split [s]	25	39	0	25	39	0	17	39	0	17	39	0
Vehicle Extension [s]	2.5	3.5	0.0	2.5	3.5	0.0	2.5	3.5	0.0	2.5	3.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	6	0
Pedestrian Clearance [s]	0	16	0	0	16	0	0	20	0	0	20	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]	3.0	3.5	0.0	3.0	3.5	0.0	3.0	3.8	0.0	3.0	3.8	0.0
Minimum Recall	No	Yes		No	Yes		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]	5.0	5.0	0.0	5.0	5.0	0.0	5.0	5.0	0.0	5.0	5.0	0.0
Detector Length [ft]	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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]	125	125	125	125	125	125	125	125	125	125	125	125
L, Total Lost Time per Cycle [s]	5.50	5.50	5.50	5.50	5.50	5.50	5.00	5.80	5.80	5.00	5.80	5.80
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	3.50	3.50	0.00	3.50	3.50	3.00	3.80	3.80	3.00	3.80	3.80
g_i, Effective Green Time [s]	56	41	41	56	43	43	17	32	32	20	35	35
g / C, Green / Cycle	0.45	0.33	0.33	0.45	0.34	0.34	0.14	0.26	0.26	0.16	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.16	0.29	0.29	0.21	0.23	0.13	0.12	0.24	0.24	0.16	0.23	0.24
s, saturation flow rate [veh/h]	889	1881	1652	833	3582	1553	1810	3547	1850	1810	3547	1826
c, Capacity [veh/h]	354	626	549	308	1229	533	245	922	481	288	1006	518
d1, Uniform Delay [s]	23.72	38.97	39.47	27.49	35.17	30.98	53.05	45.08	45.09	52.54	41.89	41.92
k, delay calibration	0.13	0.25	0.27	0.50	0.13	0.13	0.21	0.13	0.37	0.40	0.13	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]	0.89	7.96	11.34	7.32	0.81	0.54	17.44	5.54	21.25	51.86	2.17	10.41
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

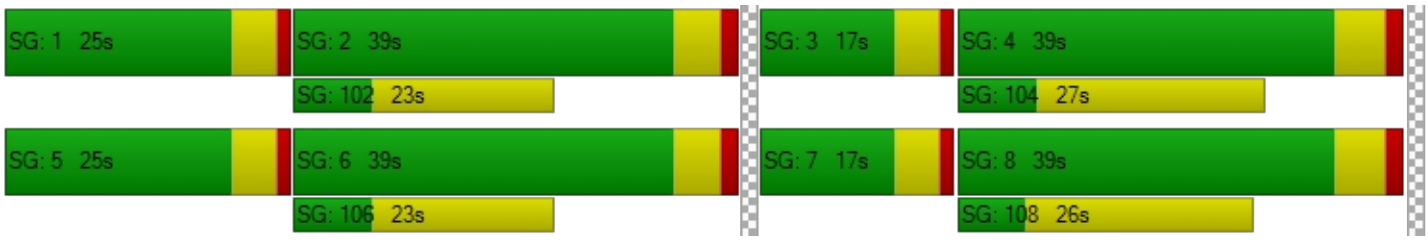
X, volume / capacity	0.40	0.86	0.89	0.57	0.68	0.38	0.88	0.93	0.93	1.02	0.83	0.83
d, Delay for Lane Group [s/veh]	24.61	46.93	50.81	34.81	35.98	31.52	70.49	50.63	66.34	104.39	44.07	52.33
Lane Group LOS	C	D	D	C	D	C	E	D	E	F	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	2.61	16.65	15.74	3.75	11.00	4.70	7.87	13.54	16.23	13.14	12.22	13.80
50th-Percentile Queue Length [ft]	65.13	416.25	393.43	93.69	275.11	117.49	196.74	338.47	405.65	328.48	305.43	345.10
95th-Percentile Queue Length [veh]	4.69	23.34	22.24	6.75	16.44	8.26	12.47	19.57	22.83	19.25	17.95	19.90
95th-Percentile Queue Length [ft]	117.23	583.55	556.08	168.64	411.12	206.38	311.76	489.33	570.80	481.24	448.74	497.44

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.61	47.94	50.81	34.81	35.98	31.52	70.49	55.87	66.34	104.39	46.69	52.33
Movement LOS	C	D	D	C	D	C	E	E	E	F	D	D
d_A, Approach Delay [s/veh]	45.82			35.07			58.08			57.72		
Approach LOS	D			D			E			E		
d_I, Intersection Delay [s/veh]	50.23											
Intersection LOS	D											
Intersection V/C	0.761											

Sequence

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



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Intersection Level Of Service Report
Intersection 9: Grand Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.769

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	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	2	0	1
Pocket Length [ft]	160.00	100.00	100.00	170.00	100.00	100.00	120.00	100.00	100.00	170.00	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			No		

Volumes

Name												
Base Volume Input [veh/h]	45	5	137	96	3	59	75	2135	27	97	1262	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	0.00	0.00	0.00	0.00	2.00	0.00	1.00	4.00	9.00	2.00	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]	45	5	137	96	3	59	75	2135	27	97	1262	61
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	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	1	36	25	1	16	20	562	7	26	332	16
Total Analysis Volume [veh/h]	47	5	144	101	3	62	79	2247	28	102	1328	64
Pedestrian Volume [ped/h]	0			4			3			0		
Bicycle Volume [bicycles/h]	0			1			2			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	15.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.05	0.05	0.06	0.04	0.04	0.05	0.47	0.47	0.03	0.28	0.04
Intersection LOS	C											
Intersection V/C	0.769											

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Intersection Level Of Service Report
Intersection 10: Grand Avenue & Burnett Street

Control Type:	Two-way stop	Delay (sec / veh):	9.7
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.039

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	90.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	30	30	17	102	21	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	0.00	0.00	12.00	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]	30	30	17	102	21	7
Peak Hour Factor	0.6700	0.6700	0.6700	0.6700	0.6700	0.6700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	11	6	38	8	3
Total Analysis Volume [veh/h]	45	45	25	152	31	10
Pedestrian Volume [ped/h]	0		0		7	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
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	0.00	0.00	0.00	0.04	0.01
d_M, Delay for Movement [s/veh]	7.71	0.00	0.00	0.00	9.71	8.49
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.21	0.21	0.00	0.00	0.12	0.03
95th-Percentile Queue Length [ft]	5.24	5.24	0.00	0.00	3.04	0.73
d_A, Approach Delay [s/veh]	3.85		0.00		9.41	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.38					
Intersection LOS	A					

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Intersection Level Of Service Report

Intersection 11: Lakewood Boulevard & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.017

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	0	2	0	1	2	0	0
Pocket Length [ft]	175.00	100.00	100.00	140.00	100.00	100.00	175.00	100.00	300.00	150.00	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]	202	1063	164	144	1335	284	323	1760	301	192	966	546
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	2.00	3.00	1.00	1.00	4.00	2.00	0.00	1.00	1.00	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
Total Hourly Volume [veh/h]	202	1063	164	144	1335	284	323	1760	301	192	966	546
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	52	274	42	37	344	73	83	454	78	49	249	141
Total Analysis Volume [veh/h]	208	1096	169	148	1376	293	333	1814	310	198	996	563
Pedestrian Volume [ped/h]	4			6			7			2		
Bicycle Volume [bicycles/h]	2			1			2			2		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.20	0.20	0.05	0.35	0.35	0.10	0.38	0.13	0.06	0.24	0.24
Intersection LOS	F											
Intersection V/C	1.017											

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Intersection Level Of Service Report

Intersection 12: Temple Avenue & Spring Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.730

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	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	150.00	100.00	100.00	130.00	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			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	402	1	124	30	6	11	23	1356	274	67	1496	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00	2.00	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]	402	1	124	30	6	11	23	1356	274	67	1496	3
Peak Hour Factor	1.0000	0.8600	0.8600	0.8600	0.8600	1.0000	1.0000	1.0000	1.0000	0.8600	1.0000	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	101	0	36	9	2	3	6	339	69	19	374	1
Total Analysis Volume [veh/h]	402	1	144	35	7	11	23	1356	274	78	1496	3
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			1			1			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.09	0.09	0.02	0.01	0.01	0.01	0.34	0.34	0.05	0.31	0.31
Intersection LOS	C											
Intersection V/C	0.730											

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Intersection Level Of Service Report
Intersection 13: Temple Avenue & I-405 Northbound Off-Ramps

Control Type:	Signalized	Delay (sec / veh):	11.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.432

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
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	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	468	0	0	301	353	139
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	3.00	4.00	1.00
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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	468	0	0	301	353	139
Peak Hour Factor	0.8600	1.0000	1.0000	0.8600	0.8600	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	136	0	0	88	103	40
Total Analysis Volume [veh/h]	544	0	0	350	410	162
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		1	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	4	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	10	0	0	10	10	0
Maximum Green [s]	30	0	0	30	25	0
Amber [s]	4.4	0.0	0.0	4.4	4.1	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	55	0	0	55	35	0
Vehicle Extension [s]	4.0	0.0	0.0	4.0	4.0	0.0
Walk [s]	7	0	0	0	0	0
Pedestrian Clearance [s]	10	0	0	0	0	0
Rest In Walk	Yes			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.4	0.0	0.0	3.4	3.1	0.0
Minimum Recall	Yes			Yes	No	
Maximum Recall	No			No	No	
Pedestrian Recall	Yes			No	No	
Detector Location [ft]	5.0	0.0	0.0	5.0	5.0	0.0
Detector Length [ft]	20.0	0.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	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	R
C, Cycle Length [s]	42	42	42	42
L, Total Lost Time per Cycle [s]	5.40	5.40	5.10	5.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.10	3.10
g_i, Effective Green Time [s]	17	17	14	14
g / C, Green / Cycle	0.41	0.41	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.17	0.11	0.26	0.11
s, saturation flow rate [veh/h]	3192	3161	1566	1439
c, Capacity [veh/h]	1295	1282	540	496
d1, Uniform Delay [s]	8.95	8.35	12.23	10.17
k, delay calibration	0.15	0.15	0.15	0.15
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.31	0.16	3.15	0.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.42	0.27	0.76	0.33
d, Delay for Lane Group [s/veh]	9.26	8.52	15.38	10.71
Lane Group LOS	A	A	B	B
Critical Lane Group	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	1.38	0.82	3.12	0.94
50th-Percentile Queue Length [ft]	34.45	20.56	77.94	23.59
95th-Percentile Queue Length [veh]	2.48	1.48	5.61	1.70
95th-Percentile Queue Length [ft]	62.01	37.02	140.29	42.47

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	9.26	0.00	0.00	8.52	15.38	10.71
Movement LOS	A			A	B	B
d_A, Approach Delay [s/veh]	9.26		8.52		14.06	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	10.96					
Intersection LOS	B					
Intersection V/C	0.432					

Sequence

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

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Intersection Level Of Service Report

Intersection 14: Temple Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.800

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	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	130.00	100.00	100.00	130.00	100.00	100.00	200.00	100.00	100.00	195.00	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	217	47	152	425	243	46	1621	144	42	1296	72
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	2.00	3.00	2.00	1.00	13.00	1.00	1.00	10.00	1.00	6.00
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	217	47	152	425	243	46	1621	144	42	1296	72
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	58	13	40	113	65	12	431	38	11	345	19
Total Analysis Volume [veh/h]	62	231	50	162	452	259	49	1724	153	45	1379	77
Pedestrian Volume [ped/h]	0			7			2			2		
Bicycle Volume [bicycles/h]	2			2			3			2		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.09	0.09	0.10	0.22	0.22	0.03	0.39	0.39	0.03	0.30	0.30
Intersection LOS	D											
Intersection V/C	0.800											

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Intersection Level Of Service Report

Intersection 15: Cherry Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.947

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	2	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	105.00	175.00	100.00	100.00	245.00	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]	159	868	217	294	922	199	232	1372	137	279	1162	222
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	3.00	0.00	1.00	2.00	1.00	1.00	0.00	1.00	1.00	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]	159	868	217	294	922	199	232	1372	137	279	1162	222
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	41	224	56	76	238	51	60	354	35	72	299	57
Total Analysis Volume [veh/h]	164	895	224	303	951	205	239	1414	141	288	1198	229
Pedestrian Volume [ped/h]	7			3			8			6		
Bicycle Volume [bicycles/h]	0			4			4			3		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.19	0.05	0.09	0.24	0.24	0.07	0.32	0.32	0.09	0.30	0.30
Intersection LOS	E											
Intersection V/C	0.947											

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Intersection Level Of Service Report

Intersection 16: I-405 Southbound Off-Ramps & Spring Street

Control Type:	Signalized	Delay (sec / veh):	10.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.537

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	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	180.00	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			Yes			Yes			No		

Volumes

Name												
Base Volume Input [veh/h]	0	0	0	431	3	100	0	1324	10	0	1292	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	5.00	0.00	11.00	2.00	1.00	0.00	2.00	1.00	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]	0	0	0	431	3	100	0	1324	10	0	1292	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	0.9100	0.9100	1.0000	1.0000	0.9100	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	108	1	27	0	331	3	0	323	0
Total Analysis Volume [veh/h]	0	0	0	431	3	110	0	1324	11	0	1292	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			3			0		
Bicycle Volume [bicycles/h]	0			0			1			1		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	30.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	0	0	0	4	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	0	10	0	0	17	0	0	17	0
Maximum Green [s]	0	0	0	0	30	0	0	50	0	0	50	0
Amber [s]	0.0	0.0	0.0	0.0	4.1	0.0	0.0	4.4	0.0	0.0	4.4	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	0	0	0	35	0	0	55	0	0	55	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	2.5	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Walk [s]	0	0	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	23	0	0	0	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	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	0.0	0.0	0.0	3.1	0.0	0.0	3.4	0.0	0.0	3.4	0.0
Minimum Recall					No			Yes			Yes	
Maximum Recall					No			No			No	
Pedestrian Recall					No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group		L	C	R	C	C	C
C, Cycle Length [s]		52	52	52	52	52	52
L, Total Lost Time per Cycle [s]		5.10	5.10	5.10	5.40	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		3.10	3.10	3.10	3.40	3.40	3.40
g_i, Effective Green Time [s]		10	10	10	31	31	31
g / C, Green / Cycle		0.20	0.20	0.20	0.60	0.60	0.60
(v / s)_i Volume / Saturation Flow Rate		0.14	0.14	0.08	0.39	0.40	0.40
s, saturation flow rate [veh/h]		1551	1630	1309	1693	1687	3224
c, Capacity [veh/h]		312	328	264	1010	1006	1923
d1, Uniform Delay [s]		19.18	19.18	18.08	6.98	7.00	7.06
k, delay calibration		0.08	0.08	0.08	0.15	0.15	0.15
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.91	1.82	0.78	1.06	1.08	0.59
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.68	0.68	0.42	0.66	0.66	0.67
d, Delay for Lane Group [s/veh]		21.09	21.00	18.86	8.05	8.08	7.65
Lane Group LOS		C	C	B	A	A	A
Critical Lane Group		Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]		2.28	2.39	1.09	3.53	3.54	3.32
50th-Percentile Queue Length [ft]		56.97	59.65	27.31	88.30	88.55	83.02
95th-Percentile Queue Length [veh]		4.10	4.29	1.97	6.36	6.38	5.98
95th-Percentile Queue Length [ft]		102.55	107.37	49.16	158.94	159.39	149.44

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	21.04	21.00	18.86	0.00	8.06	8.08	0.00	7.65	0.00
Movement LOS				C	C	B		A	A		A	
d_A, Approach Delay [s/veh]	0.00			20.60			8.06			7.65		
Approach LOS	A			C			A			A		
d_I, Intersection Delay [s/veh]	10.04											
Intersection LOS	B											
Intersection V/C	0.537											

Sequence

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

Appendix F

LOS and Signal Warrant Worksheets – Cumulative (2019) Plus Project Conditions

Generated with PTV VISTRO

Version 5.00-03

Intersection Level Of Service Report

Intersection 1: Redondo Avenue & Spring Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.778

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	0	0	0	1	0	0	2	0	0
Pocket Length [ft]	250.00	100.00	100.00	100.00	100.00	100.00	120.00	100.00	100.00	220.00	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]	546	2	292	5	2	1	3	744	345	320	1322	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 [%]	1.00	0.00	1.00	0.00	0.00	0.00	0.00	3.00	2.00	3.00	1.00	10.00
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	1	0	0	0	0	0	44	11	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	554	2	293	5	2	1	3	744	389	331	1322	10
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	152	1	80	1	1	0	1	204	107	91	363	3
Total Analysis Volume [veh/h]	609	2	322	5	2	1	3	818	427	364	1453	11
Pedestrian Volume [ped/h]	0			1			0			0		
Bicycle Volume [bicycles/h]	1			0			1			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.19	0.10	0.10	0.00	0.00	0.00	0.00	0.26	0.26	0.11	0.31	0.31
Intersection LOS	C											
Intersection V/C	0.778											

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Intersection Level Of Service Report

Intersection 2: Redondo Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.801

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	2	0	1	2	0	0	1	0	1	2	0	1
Pocket Length [ft]	175.00	100.00	150.00	145.00	100.00	100.00	190.00	100.00	190.00	160.00	100.00	160.00
Speed [mph]	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]	259	948	474	110	365	49	120	1040	162	200	1348	281
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	1.00	11.00	2.00	4.00	2.00	3.00	7.00	5.00	2.00	3.00
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]	11	9	16	0	55	0	0	0	100	83	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	270	957	490	110	420	49	120	1040	262	283	1348	281
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	72	255	130	29	112	13	32	277	70	75	359	75
Total Analysis Volume [veh/h]	287	1018	521	117	447	52	128	1106	279	301	1434	299
Pedestrian Volume [ped/h]	5			3			0			2		
Bicycle Volume [bicycles/h]	3			0			1			0		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.21	0.23	0.04	0.10	0.10	0.08	0.23	0.17	0.09	0.30	0.19
Intersection LOS	D											
Intersection V/C	0.801											

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Intersection Level Of Service Report
Intersection 3: Redondo Avenue & Burnett Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.769

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1
Pocket Length [ft]	100.00	100.00	120.00	100.00	100.00	140.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	1554	86	32	803	30	23
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	0.00	4.00	10.00	17.00
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]	23	24	75	163	0	13
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]	1577	110	107	966	30	36
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	415	29	28	254	8	9
Total Analysis Volume [veh/h]	1660	116	113	1017	32	38
Pedestrian Volume [ped/h]	0		6		0	
Bicycle Volume [bicycles/h]	4		0		0	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	3	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.56	0.56	0.07	0.32	0.02	0.02
Intersection LOS	C					
Intersection V/C	0.769					

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Intersection Level Of Service Report
Intersection 4: Redondo Avenue & Project Driveway

Control Type:	Two-way stop	Delay (sec / veh):	51.4
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.025

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	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	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	1617	0	0	836	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	0.00	0.00	3.00	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]	34	22	78	85	2	13
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]	1651	22	78	921	2	13
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	430	6	20	240	1	3
Total Analysis Volume [veh/h]	1720	23	81	959	2	14
Pedestrian Volume [ped/h]	0		0		1	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.22	0.01	0.03	0.05
d_M, Delay for Movement [s/veh]	0.00	0.00	17.67	0.00	51.38	18.37
Movement LOS	A	A	C	A	F	C
95th-Percentile Queue Length [veh]	0.00	0.00	0.84	0.00	0.23	0.23
95th-Percentile Queue Length [ft]	0.00	0.00	20.92	0.00	5.78	5.78
d_A, Approach Delay [s/veh]	0.00		1.38		22.49	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.64					
Intersection LOS	F					

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Intersection Level Of Service Report

Intersection 5: Redondo Avenue & Industry Drive

Control Type:	Two-way stop	Delay (sec / veh):	310.8
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	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	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	150.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	46	1602	28	0	719	57	20	0	26	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	0.00	2.00	3.00	2.00	15.00	0.00	4.00	0.00	2.00	4.00
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	46	20	85	2	0	0	0	0	4	0	10
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	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	1648	48	85	721	57	20	0	26	4	0	10
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	1.0000	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	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	425	12	22	186	15	5	0	7	1	0	3
Total Analysis Volume [veh/h]	47	1699	49	88	743	59	21	0	27	4	0	10
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			Yes	Yes
Number of Storage Spaces in Median	0	0	1	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.02	0.00	0.25	0.01	0.00	0.29	0.00	0.05	0.08	0.00	0.03
d_M, Delay for Movement [s/veh]	9.67	0.00	0.00	18.45	0.00	0.00	66.30	310.85	23.07	83.40	0.00	17.90
Movement LOS	A	A	A	C	A	A	F	F	C	F		C
95th-Percentile Queue Length [veh]	0.18	0.00	0.00	0.96	0.00	0.00	1.35	1.35	1.35	0.25	0.00	0.11
95th-Percentile Queue Length [ft]	4.57	0.00	0.00	24.03	0.00	0.00	33.68	33.68	33.68	6.27	0.00	2.68
d_A, Approach Delay [s/veh]	0.25			1.82			41.98			36.62		
Approach LOS	A			A			E			E		
d_I, Intersection Delay [s/veh]	1.68											
Intersection LOS	F											

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Intersection Level Of Service Report
Intersection 6: Redondo Avenue & Hill Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.767

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	70.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	142	1433	677	75	245	152
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	1.00	3.00	0.00	0.00	1.00
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	66	6	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]	142	1499	683	75	245	152
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	390	178	20	64	40
Total Analysis Volume [veh/h]	148	1561	711	78	255	158
Pedestrian Volume [ped/h]	0		0		7	
Bicycle Volume [bicycles/h]	5		0		1	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	2	6	0	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.49	0.25	0.25	0.16	0.10
Intersection LOS	C					
Intersection V/C	0.767					

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Intersection Level Of Service Report

Intersection 7: Redondo Avenue & Stearns Street

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

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	1	1
Pocket Length [ft]	100.00	100.00	110.00	100.00	70.00	70.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	1379	154	120	712	220	182
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	3.00	3.00	3.00	0.00	2.00
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]	55	0	1	5	0	11
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]	1434	154	121	717	220	193
Peak Hour Factor	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	366	39	31	183	56	49
Total Analysis Volume [veh/h]	1463	157	123	732	224	197
Pedestrian Volume [ped/h]	0		0		1	
Bicycle Volume [bicycles/h]	3		2		2	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	3	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.51	0.51	0.08	0.23	0.07	0.09
Intersection LOS	C					
Intersection V/C	0.791					

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Intersection Level Of Service Report

Intersection 8: Redondo Avenue & Pacific Coast Highway

Control Type:	Signalized	Delay (sec / veh):	66.5
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.809

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	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	1	0	0	1	0	0
Pocket Length [ft]	200.00	100.00	100.00	150.00	100.00	65.00	160.00	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]	131	977	240	90	435	153	225	1053	10	236	1344	63
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	1.00	1.00	2.00	3.00	5.00	2.00	2.00	0.00	2.00	3.00	3.00
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	11	0	2	1	2	22	0	0	0	0	22
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	131	988	240	92	436	155	247	1053	10	236	1344	85
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	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	255	62	24	112	40	64	271	3	61	346	22
Total Analysis Volume [veh/h]	135	1019	247	95	449	160	255	1086	10	243	1386	88
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	5			6			8			16		
Bicycle Volume [bicycles/h]	3			1			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	47.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	7	4	0	3	8	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	10	0	7	10	0	7	8	0	7	8	0
Maximum Green [s]	20	50	0	20	50	0	20	33	0	20	33	0
Amber [s]	4.0	4.1	0.0	4.0	4.1	0.0	4.0	4.4	0.0	4.0	4.4	0.0
All red [s]	1.0	1.4	0.0	1.0	1.4	0.0	1.0	1.4	0.0	1.0	1.4	0.0
Split [s]	25	42	0	25	42	0	17	36	0	17	36	0
Vehicle Extension [s]	2.5	3.5	0.0	2.5	3.5	0.0	2.5	3.5	0.0	2.5	3.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	6	0
Pedestrian Clearance [s]	0	16	0	0	16	0	0	20	0	0	20	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]	3.0	3.5	0.0	3.0	3.5	0.0	3.0	3.8	0.0	3.0	3.8	0.0
Minimum Recall	No	Yes		No	Yes		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]	5.0	5.0	0.0	5.0	5.0	0.0	5.0	5.0	0.0	5.0	5.0	0.0
Detector Length [ft]	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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]	130	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	5.50	5.50	5.50	5.50	5.50	5.50	5.00	5.80	5.80	5.00	5.80	5.80
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	3.50	3.50	0.00	3.50	3.50	3.00	3.80	3.80	3.00	3.80	3.80
g_i, Effective Green Time [s]	60	49	49	60	48	48	20	33	33	20	33	33
g / C, Green / Cycle	0.47	0.38	0.38	0.47	0.37	0.37	0.15	0.26	0.26	0.15	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.12	0.35	0.35	0.15	0.13	0.11	0.14	0.20	0.20	0.14	0.28	0.28
s, saturation flow rate [veh/h]	1100	1881	1736	654	3512	1509	1774	3547	1854	1774	3512	1786
c, Capacity [veh/h]	508	706	651	238	1288	553	273	913	477	267	893	454
d1, Uniform Delay [s]	20.63	38.74	39.26	28.76	29.85	29.12	54.30	44.91	44.91	54.28	48.40	48.40
k, delay calibration	0.13	0.38	0.40	0.35	0.13	0.13	0.34	0.13	0.29	0.31	0.13	0.49
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.33	15.83	20.58	3.46	0.20	0.34	31.43	1.88	7.56	25.84	47.50	70.32
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

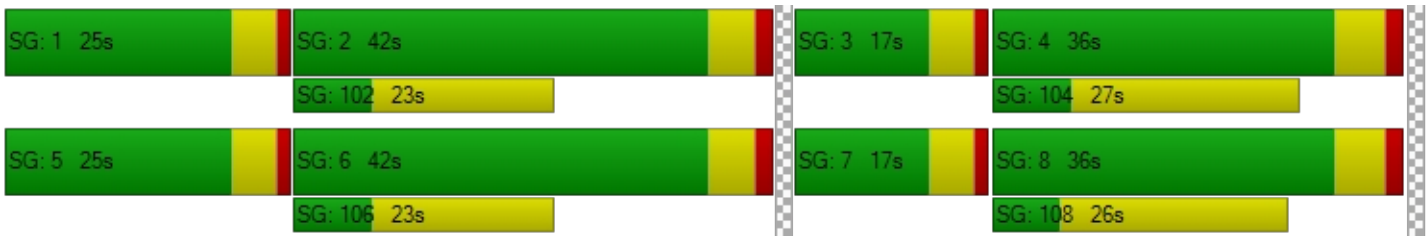
X, volume / capacity	0.27	0.92	0.95	0.40	0.35	0.29	0.94	0.79	0.79	0.91	1.09	1.10
d, Delay for Lane Group [s/veh]	20.97	54.58	59.84	32.22	30.05	29.47	85.73	46.79	52.47	80.12	95.91	118.73
Lane Group LOS	C	D	E	C	C	C	F	D	D	F	F	F
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	2.44	22.64	22.45	1.87	5.17	3.62	10.60	11.02	12.27	9.73	20.25	23.48
50th-Percentile Queue Length [ft]	60.89	565.95	561.23	46.76	129.27	90.60	265.10	275.43	306.82	243.15	506.37	587.03
95th-Percentile Queue Length [veh]	4.38	30.44	30.22	3.37	8.90	6.52	15.94	16.46	18.02	14.84	29.12	33.19
95th-Percentile Queue Length [ft]	109.59	761.03	755.49	84.17	222.50	163.08	398.61	411.52	450.45	371.01	728.01	829.83

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	20.97	56.48	59.84	32.22	30.05	29.47	85.73	48.70	52.47	80.12	102.65	118.73
Movement LOS	C	E	E	C	C	C	F	D	D	F	F	F
d_A, Approach Delay [s/veh]	53.65			30.21			55.72			100.29		
Approach LOS	D			C			E			F		
d_I, Intersection Delay [s/veh]	66.48											
Intersection LOS	E											
Intersection V/C	0.809											

Sequence

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



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Intersection Level Of Service Report

Intersection 9: Grand Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.676

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	1	0	0	1	0	0	1	0	0	2	0	1
Pocket Length [ft]	160.00	100.00	100.00	170.00	100.00	100.00	120.00	100.00	100.00	170.00	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			No		

Volumes

Name												
Base Volume Input [veh/h]	21	3	20	29	4	41	72	1319	72	217	1876	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 [%]	14.00	0.00	25.00	0.00	0.00	3.00	1.00	3.00	3.00	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	3	0	0	0	0	16	0	28	83	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	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	3	23	29	4	41	72	1335	72	245	1959	116
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	1	6	8	1	11	19	355	19	65	521	31
Total Analysis Volume [veh/h]	22	3	24	31	4	44	77	1420	77	261	2084	123
Pedestrian Volume [ped/h]	0			9			10			0		
Bicycle Volume [bicycles/h]	0			0			2			1		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	15.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.02	0.03	0.03	0.05	0.31	0.31	0.08	0.43	0.08
Intersection LOS	B											
Intersection V/C	0.676											

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Intersection Level Of Service Report
Intersection 10: Grand Avenue & Burnett Street

Control Type:	Two-way stop	Delay (sec / veh):	9.1
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.055

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	90.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	7	5	44	68	42	24
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	43.00	20.00	2.00	1.00	0.00	4.00
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	28	3	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]	7	5	44	96	45	24
Peak Hour Factor	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	1	12	27	13	7
Total Analysis Volume [veh/h]	8	6	49	108	51	27
Pedestrian Volume [ped/h]	0		0		5	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
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	0.00	0.00	0.00	0.06	0.03
d_M, Delay for Movement [s/veh]	8.03	0.00	0.00	0.00	9.14	8.69
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.04	0.04	0.00	0.00	0.18	0.08
95th-Percentile Queue Length [ft]	0.89	0.89	0.00	0.00	4.39	2.07
d_A, Approach Delay [s/veh]	4.59		0.00		8.98	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.07					
Intersection LOS	A					

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Intersection Level Of Service Report

Intersection 11: Lakewood Boulevard & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.138

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	0	2	0	1	2	0	0
Pocket Length [ft]	175.00	100.00	100.00	140.00	100.00	100.00	175.00	100.00	300.00	150.00	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]	298	1363	211	107	1264	511	203	1119	137	100	1439	809
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	1.00	1.00	0.00	2.00	3.00	5.00	3.00	4.00	4.00	1.00	1.00
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	99	3	15	0	0	11	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	298	1363	211	107	1264	610	206	1134	137	100	1450	809
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	80	366	57	29	340	164	55	305	37	27	390	217
Total Analysis Volume [veh/h]	320	1466	227	115	1359	656	222	1219	147	108	1559	870
Pedestrian Volume [ped/h]	6			5			5			1		
Bicycle Volume [bicycles/h]	0			0			0			2		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.26	0.26	0.04	0.42	0.42	0.07	0.25	0.00	0.03	0.38	0.38
Intersection LOS	F											
Intersection V/C	1.138											

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Intersection Level Of Service Report

Intersection 12: Temple Avenue & Spring Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.699

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	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	150.00	100.00	100.00	130.00	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			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	404	17	100	3	2	4	34	1097	245	115	1683	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	6.00	3.00	0.00	0.00	0.00	6.00	3.00	3.00	4.00	1.00	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	0	11	0	0	0	0	33	14	0	8	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	408	17	111	3	2	4	34	1130	259	115	1691	3
Peak Hour Factor	1.0000	0.8900	0.8900	0.8900	0.8900	1.0000	1.0000	1.0000	1.0000	0.8900	1.0000	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	102	5	31	1	1	1	9	283	65	32	423	1
Total Analysis Volume [veh/h]	408	19	125	3	2	4	34	1130	259	129	1691	3
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			4			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.09	0.09	0.00	0.00	0.00	0.02	0.29	0.29	0.08	0.35	0.35
Intersection LOS	B											
Intersection V/C	0.699											

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Intersection Level Of Service Report
Intersection 13: Temple Avenue & I-405 Northbound Off-Ramps

Control Type:	Signalized	Delay (sec / veh):	9.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.330

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
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	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	385	0	0	353	238	130
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.00	2.00	2.00	2.00	5.00	5.00
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]	4	0	0	14	25	11
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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	389	0	0	367	263	141
Peak Hour Factor	0.8900	1.0000	1.0000	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	109	0	0	103	74	40
Total Analysis Volume [veh/h]	437	0	0	412	296	158
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	2		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	4	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	10	0	0	10	10	0
Maximum Green [s]	30	0	0	30	25	0
Amber [s]	4.4	0.0	0.0	4.4	4.1	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	55	0	0	55	35	0
Vehicle Extension [s]	4.0	0.0	0.0	4.0	4.0	0.0
Walk [s]	7	0	0	0	0	0
Pedestrian Clearance [s]	10	0	0	0	0	0
Rest In Walk	Yes			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.4	0.0	0.0	3.4	3.1	0.0
Minimum Recall	Yes			Yes	No	
Maximum Recall	No			No	No	
Pedestrian Recall	Yes			No	No	
Detector Location [ft]	5.0	0.0	0.0	5.0	5.0	0.0
Detector Length [ft]	20.0	0.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	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	R
C, Cycle Length [s]	38	38	38	38
L, Total Lost Time per Cycle [s]	5.40	5.40	5.10	5.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.10	3.10
g_i, Effective Green Time [s]	17	17	11	11
g / C, Green / Cycle	0.45	0.45	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.14	0.13	0.19	0.11
s, saturation flow rate [veh/h]	3131	3192	1551	1384
c, Capacity [veh/h]	1395	1422	434	388
d1, Uniform Delay [s]	6.83	6.75	12.26	11.20
k, delay calibration	0.15	0.15	0.15	0.15
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.18	0.16	2.68	0.98
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.31	0.29	0.68	0.41
d, Delay for Lane Group [s/veh]	7.01	6.91	14.94	12.18
Lane Group LOS	A	A	B	B
Critical Lane Group	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	0.79	0.74	2.07	0.95
50th-Percentile Queue Length [ft]	19.83	18.44	51.64	23.87
95th-Percentile Queue Length [veh]	1.43	1.33	3.72	1.72
95th-Percentile Queue Length [ft]	35.69	33.19	92.95	42.97

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	7.01	0.00	0.00	6.91	14.94	12.18
Movement LOS	A			A	B	B
d_A, Approach Delay [s/veh]	7.01		6.91		13.98	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	9.41					
Intersection LOS	A					
Intersection V/C	0.330					

Sequence

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

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Intersection Level Of Service Report
Intersection 14: Temple Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.700

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	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]	130.00	100.00	100.00	130.00	100.00	100.00	200.00	100.00	100.00	195.00	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]	94	355	73	62	196	141	65	1188	83	30	1468	83
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	9.00	1.00	8.00	11.00	4.00	6.00	0.00	2.00	2.00	0.00	2.00	5.00
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	38	0	0	0	62	0	0	7	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]	94	355	73	100	196	141	65	1250	83	30	1475	87
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	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	91	19	26	51	36	17	322	21	8	380	22
Total Analysis Volume [veh/h]	97	366	75	103	202	145	67	1289	86	31	1521	90
Pedestrian Volume [ped/h]	1			0			2			2		
Bicycle Volume [bicycles/h]	3			0			2			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.14	0.14	0.06	0.11	0.11	0.04	0.29	0.29	0.02	0.34	0.34
Intersection LOS	B											
Intersection V/C	0.700											

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Intersection Level Of Service Report
Intersection 15: Cherry Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.877

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	2	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	105.00	175.00	100.00	100.00	245.00	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]	159	1060	206	214	867	149	208	966	96	223	1166	134
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	2.00	1.00	3.00	3.00	1.00	1.00	2.00	5.00	4.00	3.00	4.00
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	28	0	0	0	34	0	0	4	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]	159	1060	206	242	867	149	208	1000	96	223	1170	137
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	282	55	64	231	40	55	266	26	59	311	36
Total Analysis Volume [veh/h]	169	1128	219	257	922	159	221	1064	102	237	1245	146
Pedestrian Volume [ped/h]	3			5			11			3		
Bicycle Volume [bicycles/h]	1			0			2			1		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.24	0.06	0.08	0.23	0.23	0.07	0.24	0.24	0.07	0.29	0.29
Intersection LOS	D											
Intersection V/C	0.877											

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Intersection Level Of Service Report

Intersection 16: I-405 Southbound Off-Ramps & Spring Street

Control Type:	Signalized	Delay (sec / veh):	20.5
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.705

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	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	180.00	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			Yes			Yes			No		

Volumes

Name												
Base Volume Input [veh/h]	0	0	0	697	2	260	0	1109	4	0	1522	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	0.00	3.00	2.00	4.00	25.00	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	36	0	0	0	11	0	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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	733	2	260	0	1120	4	0	1523	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	183	1	72	0	280	1	0	381	0
Total Analysis Volume [veh/h]	0	0	0	733	2	289	0	1120	4	0	1523	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			1			0			0		
Bicycle Volume [bicycles/h]	0			0			3			1		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	15.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	0	0	0	4	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	0	10	0	0	17	0	0	17	0
Maximum Green [s]	0	0	0	0	30	0	0	50	0	0	50	0
Amber [s]	0.0	0.0	0.0	0.0	4.1	0.0	0.0	4.4	0.0	0.0	4.4	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	0	0	0	35	0	0	55	0	0	55	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	2.5	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Walk [s]	0	0	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	23	0	0	0	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	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	0.0	0.0	0.0	3.1	0.0	0.0	3.4	0.0	0.0	3.4	0.0
Minimum Recall					No			Yes			Yes	
Maximum Recall					No			No			No	
Pedestrian Recall					Yes			No			Yes	
Detector Location [ft]	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group		L	C	R	C	C	C
C, Cycle Length [s]		89	89	89	89	89	89
L, Total Lost Time per Cycle [s]		5.10	5.10	5.10	5.40	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		3.10	3.10	3.10	3.40	3.40	3.40
g_i, Effective Green Time [s]		30	30	30	48	48	48
g / C, Green / Cycle		0.34	0.34	0.34	0.54	0.54	0.54
(v / s)_i Volume / Saturation Flow Rate		0.23	0.23	0.20	0.34	0.34	0.48
s, saturation flow rate [veh/h]		1597	1629	1411	1644	1642	3192
c, Capacity [veh/h]		540	551	477	894	892	1735
d1, Uniform Delay [s]		25.17	25.16	24.44	14.04	14.06	17.68
k, delay calibration		0.17	0.17	0.12	0.20	0.20	0.15
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		2.35	2.30	1.39	1.36	1.37	2.21
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.67	0.67	0.61	0.63	0.63	0.88
d, Delay for Lane Group [s/veh]		27.52	27.46	25.83	15.41	15.43	19.89
Lane Group LOS		C	C	C	B	B	B
Critical Lane Group		Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]		6.67	6.80	5.06	7.48	7.49	12.72
50th-Percentile Queue Length [ft]		166.80	169.93	126.46	187.02	187.21	317.90
95th-Percentile Queue Length [veh]		10.91	11.07	8.75	11.97	11.98	18.56
95th-Percentile Queue Length [ft]		272.70	276.83	218.67	299.16	299.41	464.10

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	27.49	27.46	25.83	0.00	15.42	15.43	0.00	19.89	0.00
Movement LOS				C	C	C		B	B		B	
d_A, Approach Delay [s/veh]	0.00			27.02			15.42			19.89		
Approach LOS	A			C			B			B		
d_I, Intersection Delay [s/veh]	20.51											
Intersection LOS	C											
Intersection V/C	0.705											

Sequence

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

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Intersection Level Of Service Report

Intersection 1: Redondo Avenue & Spring Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.873

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	1	0	0	0	0	0	1	0	0	2	0	0
Pocket Length [ft]	250.00	100.00	100.00	100.00	100.00	100.00	120.00	100.00	100.00	220.00	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]	566	0	387	5	3	3	9	1107	396	242	912	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	20.00	0.00	0.00	22.00	1.00	3.00	3.00	1.00	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]	56	0	11	0	0	0	0	0	6	1	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	622	0	398	5	3	3	9	1107	402	243	912	5
Peak Hour Factor	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	175	0	112	1	1	1	3	311	113	68	256	1
Total Analysis Volume [veh/h]	699	0	447	6	3	3	10	1244	452	273	1025	6
Pedestrian Volume [ped/h]	0			1			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.22	0.00	0.14	0.00	0.00	0.00	0.01	0.35	0.35	0.09	0.21	0.21
Intersection LOS	D											
Intersection V/C	0.873											

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Intersection Level Of Service Report
Intersection 2: Redondo Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.949

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	0	1	0	1	2	0	1
Pocket Length [ft]	175.00	100.00	150.00	145.00	100.00	100.00	190.00	100.00	190.00	160.00	100.00	160.00
Speed [mph]	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]	213	595	416	276	654	126	69	1551	291	252	1051	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.00	1.00	1.00	1.00	2.00	6.00	3.00	1.00	1.00	1.00	1.00	4.00
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]	92	67	101	0	7	0	0	0	14	11	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	305	662	517	276	661	126	69	1551	305	263	1051	124
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	81	176	138	73	176	34	18	413	81	70	280	33
Total Analysis Volume [veh/h]	324	704	550	294	703	134	73	1650	324	280	1118	132
Pedestrian Volume [ped/h]	4			4			2			2		
Bicycle Volume [bicycles/h]	0			1			3			1		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.15	0.26	0.09	0.17	0.17	0.05	0.34	0.20	0.09	0.23	0.08
Intersection LOS	E											
Intersection V/C	0.949											

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Intersection Level Of Service Report
Intersection 3: Redondo Avenue & Burnett Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.698

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1
Pocket Length [ft]	100.00	100.00	120.00	100.00	100.00	140.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	1175	39	10	1214	105	53
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	1.00	2.00	21.00
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]	178	0	10	22	24	82
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]	1353	39	20	1236	129	135
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	368	11	5	336	35	37
Total Analysis Volume [veh/h]	1471	42	22	1343	140	147
Pedestrian Volume [ped/h]	0		2		0	
Bicycle Volume [bicycles/h]	0		2		1	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	3	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.47	0.47	0.01	0.42	0.09	0.09
Intersection LOS	B					
Intersection V/C	0.698					

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Intersection Level Of Service Report
Intersection 4: Redondo Avenue & Project Driveway

Control Type:	Two-way stop	Delay (sec / veh):	36.7
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.155

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	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	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	1165	0	0	1272	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	0.00	0.00	1.00	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]	88	2	10	36	22	90
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]	1253	2	10	1308	22	90
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	333	1	3	348	6	24
Total Analysis Volume [veh/h]	1333	2	11	1391	23	96
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.02	0.01	0.16	0.24
d_M, Delay for Movement [s/veh]	0.00	0.00	12.03	0.00	36.70	21.30
Movement LOS	A	A	B	A	E	C
95th-Percentile Queue Length [veh]	0.00	0.00	0.06	0.00	1.79	1.79
95th-Percentile Queue Length [ft]	0.00	0.00	1.61	0.00	44.81	44.81
d_A, Approach Delay [s/veh]	0.00		0.09		24.27	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	1.06					
Intersection LOS	E					

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Intersection Level Of Service Report

Intersection 5: Redondo Avenue & Industry Drive

Control Type:	Two-way stop	Delay (sec / veh):	90.0
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.481

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	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	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	150.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	34	1099	39	0	1221	48	32	0	55	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	1.00	0.00	0.00	1.00	0.00	3.00	0.00	0.00	0.00	2.00	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	4	12	46	0	0	0	0	20	0	88
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	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	1101	43	12	1267	48	32	0	55	20	0	88
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	1.0000	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	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	302	12	3	348	13	9	0	15	5	0	24
Total Analysis Volume [veh/h]	37	1210	47	13	1392	53	35	0	60	22	0	97
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			Yes	Yes
Number of Storage Spaces in Median	0	0	1	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.01	0.00	0.02	0.01	0.00	0.48	0.00	0.16	0.24	0.00	0.23
d_M, Delay for Movement [s/veh]	13.51	0.00	0.00	11.58	0.00	0.00	90.01	79.76	50.22	56.60	0.00	15.79
Movement LOS	B	A	A	B	A	A	F	F	F	F		C
95th-Percentile Queue Length [veh]	0.26	0.00	0.00	0.07	0.00	0.00	3.51	3.51	3.51	0.87	0.00	0.86
95th-Percentile Queue Length [ft]	6.53	0.00	0.00	1.78	0.00	0.00	87.71	87.71	87.71	21.68	0.00	21.39
d_A, Approach Delay [s/veh]	0.39			0.10			64.88			23.33		
Approach LOS	A			A			F			C		
d_I, Intersection Delay [s/veh]	3.23											
Intersection LOS	F											

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Intersection Level Of Service Report
Intersection 6: Redondo Avenue & Hill Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.819

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	70.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	130	977	1195	116	198	233
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	0.00	1.00	1.00	1.00
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	6	66	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]	130	983	1261	116	198	233
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	261	335	31	53	62
Total Analysis Volume [veh/h]	138	1046	1341	123	211	248
Pedestrian Volume [ped/h]	1		0		2	
Bicycle Volume [bicycles/h]	0		3		2	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	2	6	0	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.33	0.46	0.46	0.13	0.16
Intersection LOS	D					
Intersection V/C	0.819					

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Intersection Level Of Service Report

Intersection 7: Redondo Avenue & Stearns Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.742

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	1	1
Pocket Length [ft]	100.00	100.00	110.00	100.00	70.00	70.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	942	201	238	1187	211	157
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	0.00	1.00	2.00	1.00
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]	5	0	11	55	0	1
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]	947	201	249	1242	211	158
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	249	53	66	327	56	42
Total Analysis Volume [veh/h]	997	212	262	1307	222	166
Pedestrian Volume [ped/h]	0		0		2	
Bicycle Volume [bicycles/h]	0		5		3	

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	3	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.38	0.38	0.16	0.41	0.07	0.08
Intersection LOS	C					
Intersection V/C	0.742					

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Intersection Level Of Service Report

Intersection 8: Redondo Avenue & Pacific Coast Highway

Control Type:	Signalized	Delay (sec / veh):	51.5
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.770

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	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	1	0	0	1	0	0
Pocket Length [ft]	200.00	100.00	100.00	150.00	100.00	65.00	160.00	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]	142	719	296	172	829	200	215	1271	17	290	1206	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 [%]	1.00	1.00	0.00	1.00	1.00	1.00	0.00	2.00	0.00	0.00	2.00	7.00
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	22	11	22	2	0	0	0	0	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]	142	720	296	194	840	222	217	1271	17	290	1206	45
Peak Hour Factor	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	182	75	49	212	56	55	321	4	73	305	11
Total Analysis Volume [veh/h]	143	727	299	196	848	224	219	1284	17	293	1218	45
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	8			18			19			31		
Bicycle Volume [bicycles/h]	2			1			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	47.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	7	4	0	3	8	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	10	0	7	10	0	7	8	0	7	8	0
Maximum Green [s]	20	50	0	20	50	0	20	33	0	20	33	0
Amber [s]	4.0	4.1	0.0	4.0	4.1	0.0	4.0	4.4	0.0	4.0	4.4	0.0
All red [s]	1.0	1.4	0.0	1.0	1.4	0.0	1.0	1.4	0.0	1.0	1.4	0.0
Split [s]	25	39	0	25	39	0	17	39	0	17	39	0
Vehicle Extension [s]	2.5	3.5	0.0	2.5	3.5	0.0	2.5	3.5	0.0	2.5	3.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	6	0
Pedestrian Clearance [s]	0	16	0	0	16	0	0	20	0	0	20	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]	3.0	3.5	0.0	3.0	3.5	0.0	3.0	3.8	0.0	3.0	3.8	0.0
Minimum Recall	No	Yes		No	Yes		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]	5.0	5.0	0.0	5.0	5.0	0.0	5.0	5.0	0.0	5.0	5.0	0.0
Detector Length [ft]	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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]	127	127	127	127	127	127	127	127	127	127	127	127
L, Total Lost Time per Cycle [s]	5.50	5.50	5.50	5.50	5.50	5.50	5.00	5.80	5.80	5.00	5.80	5.80
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	3.50	3.50	0.00	3.50	3.50	3.00	3.80	3.80	3.00	3.80	3.80
g_i, Effective Green Time [s]	58	42	42	58	44	44	17	33	33	20	35	35
g / C, Green / Cycle	0.46	0.33	0.33	0.46	0.35	0.35	0.14	0.26	0.26	0.16	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.16	0.29	0.30	0.23	0.24	0.14	0.12	0.24	0.24	0.16	0.23	0.24
s, saturation flow rate [veh/h]	878	1881	1652	849	3582	1553	1810	3547	1850	1810	3547	1825
c, Capacity [veh/h]	353	624	548	319	1255	544	246	914	477	284	989	509
d1, Uniform Delay [s]	23.66	39.62	40.13	27.80	34.99	31.21	53.74	45.94	45.94	53.35	43.04	43.07
k, delay calibration	0.13	0.26	0.28	0.50	0.13	0.13	0.22	0.13	0.37	0.41	0.13	0.36
I, Upstream Filtering Factor	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]	0.90	8.38	11.94	8.61	0.77	0.60	18.68	6.10	22.87	56.38	2.46	11.85
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

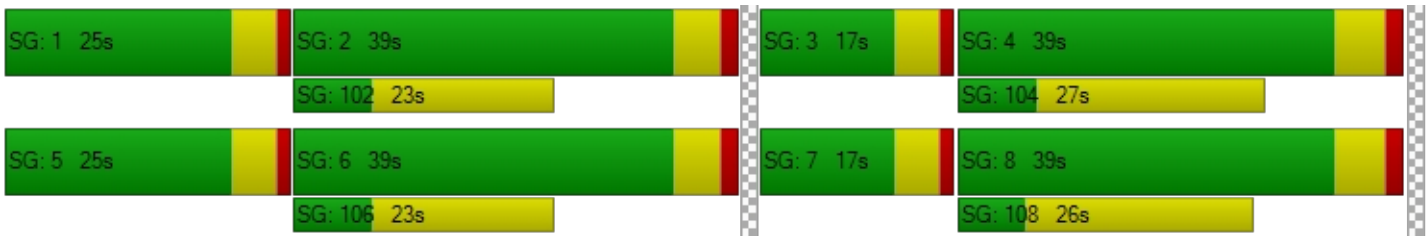
X, volume / capacity	0.40	0.86	0.89	0.62	0.68	0.41	0.89	0.93	0.94	1.03	0.84	0.84
d, Delay for Lane Group [s/veh]	24.56	48.00	52.07	36.41	35.77	31.81	72.42	52.04	68.81	109.74	45.49	54.92
Lane Group LOS	C	D	D	D	D	C	E	D	E	F	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	2.61	17.00	16.08	4.34	11.22	5.31	8.13	13.84	16.67	13.46	12.56	14.29
50th-Percentile Queue Length [ft]	65.32	425.02	402.12	108.42	280.42	132.81	203.14	346.08	416.66	336.61	313.98	357.24
95th-Percentile Queue Length [veh]	4.70	23.76	22.66	7.75	16.71	9.09	12.80	19.95	23.36	19.78	18.37	20.49
95th-Percentile Queue Length [ft]	117.58	594.07	566.56	193.80	417.73	227.31	320.02	498.63	584.04	494.42	459.27	512.23

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.56	49.05	52.07	36.41	35.77	31.81	72.42	57.64	68.81	109.74	48.47	54.92
Movement LOS	C	D	D	D	D	C	E	E	E	F	D	D
d_A, Approach Delay [s/veh]	46.83			35.17			59.90			60.19		
Approach LOS	D			D			E			E		
d_I, Intersection Delay [s/veh]	51.52											
Intersection LOS	D											
Intersection V/C	0.770											

Sequence

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



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Intersection Level Of Service Report

Intersection 9: Grand Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.797

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	0	1	0	0	1	0	0	2	0	1
Pocket Length [ft]	160.00	100.00	100.00	170.00	100.00	100.00	120.00	100.00	100.00	170.00	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			No		

Volumes

Name												
Base Volume Input [veh/h]	45	5	137	96	3	59	75	2135	27	97	1262	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	0.00	0.00	0.00	0.00	2.00	0.00	1.00	4.00	9.00	2.00	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	10	0	0	0	0	101	0	5	11	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	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	5	147	96	3	59	75	2236	27	102	1273	61
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	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	1	39	25	1	16	20	588	7	27	335	16
Total Analysis Volume [veh/h]	47	5	155	101	3	62	79	2354	28	107	1340	64
Pedestrian Volume [ped/h]	0			4			3			0		
Bicycle Volume [bicycles/h]	0			1			2			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	15.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.05	0.05	0.06	0.04	0.04	0.05	0.50	0.50	0.03	0.28	0.04
Intersection LOS	C											
Intersection V/C	0.797											

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Intersection Level Of Service Report
Intersection 10: Grand Avenue & Burnett Street

Control Type:	Two-way stop	Delay (sec / veh):	9.8
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.058

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	90.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	30	30	17	102	21	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	0.00	0.00	12.00	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	5	10	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]	30	30	17	107	31	7
Peak Hour Factor	0.6700	0.6700	0.6700	0.6700	0.6700	0.6700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	11	6	40	12	3
Total Analysis Volume [veh/h]	45	45	25	160	46	10
Pedestrian Volume [ped/h]	0		0		7	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
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	0.00	0.00	0.00	0.06	0.01
d_M, Delay for Movement [s/veh]	7.72	0.00	0.00	0.00	9.81	8.49
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.21	0.21	0.00	0.00	0.18	0.03
95th-Percentile Queue Length [ft]	5.28	5.28	0.00	0.00	4.60	0.73
d_A, Approach Delay [s/veh]	3.86		0.00		9.57	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.67					
Intersection LOS	A					

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Intersection Level Of Service Report
Intersection 11: Lakewood Boulevard & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.037

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	0	2	0	1	2	0	0
Pocket Length [ft]	175.00	100.00	100.00	140.00	100.00	100.00	175.00	100.00	300.00	150.00	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]	202	1063	164	144	1335	284	323	1760	301	192	966	546
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	2.00	3.00	1.00	1.00	4.00	2.00	0.00	1.00	1.00	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	14	29	82	0	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]	202	1063	164	144	1335	298	352	1842	301	192	967	546
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	52	274	42	37	344	77	91	475	78	49	249	141
Total Analysis Volume [veh/h]	208	1096	169	148	1376	307	363	1899	310	198	997	563
Pedestrian Volume [ped/h]	4			6			7			2		
Bicycle Volume [bicycles/h]	2			1			2			2		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.20	0.20	0.05	0.35	0.35	0.11	0.40	0.13	0.06	0.24	0.24
Intersection LOS	F											
Intersection V/C	1.037											

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Intersection Level Of Service Report

Intersection 12: Temple Avenue & Spring Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.741

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	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	150.00	100.00	100.00	130.00	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			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	402	1	124	30	6	11	23	1356	274	67	1496	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00	2.00	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]	29	0	2	0	0	0	0	5	2	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]	431	1	126	30	6	11	23	1361	276	67	1552	3
Peak Hour Factor	1.0000	0.8600	0.8600	0.8600	0.8600	1.0000	1.0000	1.0000	1.0000	0.8600	1.0000	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	108	0	37	9	2	3	6	340	69	19	388	1
Total Analysis Volume [veh/h]	431	1	147	35	7	11	23	1361	276	78	1552	3
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			1			1			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.09	0.09	0.02	0.01	0.01	0.01	0.34	0.34	0.05	0.32	0.32
Intersection LOS	C											
Intersection V/C	0.741											

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Intersection Level Of Service Report
Intersection 13: Temple Avenue & I-405 Northbound Off-Ramps

Control Type:	Signalized	Delay (sec / veh):	11.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.446

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
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	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	468	0	0	301	353	139
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	3.00	4.00	1.00
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]	29	0	0	2	4	2
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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	497	0	0	303	357	141
Peak Hour Factor	0.8600	1.0000	1.0000	0.8600	0.8600	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	144	0	0	88	104	41
Total Analysis Volume [veh/h]	578	0	0	352	415	164
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		1	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	2	0	0	6	4	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	10	0	0	10	10	0
Maximum Green [s]	30	0	0	30	25	0
Amber [s]	4.4	0.0	0.0	4.4	4.1	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	55	0	0	55	35	0
Vehicle Extension [s]	4.0	0.0	0.0	4.0	4.0	0.0
Walk [s]	7	0	0	0	0	0
Pedestrian Clearance [s]	10	0	0	0	0	0
Rest In Walk	Yes			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.4	0.0	0.0	3.4	3.1	0.0
Minimum Recall	Yes			Yes	No	
Maximum Recall	No			No	No	
Pedestrian Recall	Yes			No	No	
Detector Location [ft]	5.0	0.0	0.0	5.0	5.0	0.0
Detector Length [ft]	20.0	0.0	0.0	20.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	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	R
C, Cycle Length [s]	42	42	42	42
L, Total Lost Time per Cycle [s]	5.40	5.40	5.10	5.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	3.10	3.10
g_i, Effective Green Time [s]	17	17	15	15
g / C, Green / Cycle	0.40	0.40	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.18	0.11	0.27	0.11
s, saturation flow rate [veh/h]	3192	3161	1566	1439
c, Capacity [veh/h]	1289	1276	544	500
d1, Uniform Delay [s]	9.17	8.45	12.23	10.14
k, delay calibration	0.15	0.15	0.15	0.15
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.35	0.17	3.17	0.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.45	0.28	0.76	0.33
d, Delay for Lane Group [s/veh]	9.52	8.61	15.40	10.68
Lane Group LOS	A	A	B	B
Critical Lane Group	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	1.50	0.84	3.17	0.96
50th-Percentile Queue Length [ft]	37.60	20.96	79.21	23.91
95th-Percentile Queue Length [veh]	2.71	1.51	5.70	1.72
95th-Percentile Queue Length [ft]	67.68	37.72	142.58	43.03

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	9.52	0.00	0.00	8.61	15.40	10.68
Movement LOS	A			A	B	B
d_A, Approach Delay [s/veh]	9.52		8.61		14.06	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	11.05					
Intersection LOS	B					
Intersection V/C	0.446					

Sequence

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

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Intersection Level Of Service Report

Intersection 14: Temple Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.802

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	1	0	0	1	0	0
Pocket Length [ft]	130.00	100.00	100.00	130.00	100.00	100.00	200.00	100.00	100.00	195.00	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	217	47	152	425	243	46	1621	144	42	1296	72
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	2.00	3.00	2.00	1.00	13.00	1.00	1.00	10.00	1.00	6.00
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	6	0	0	0	8	0	0	63	29
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	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	217	47	158	425	243	46	1629	144	42	1359	101
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	58	13	42	113	65	12	433	38	11	361	27
Total Analysis Volume [veh/h]	62	231	50	168	452	259	49	1733	153	45	1446	107
Pedestrian Volume [ped/h]	0			7			2			2		
Bicycle Volume [bicycles/h]	2			2			3			2		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	12.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.09	0.09	0.11	0.22	0.22	0.03	0.39	0.39	0.03	0.32	0.32
Intersection LOS	D											
Intersection V/C	0.802											

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Intersection Level Of Service Report
Intersection 15: Cherry Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.949

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	2	0	0	2	0	0	2	0	0
Pocket Length [ft]	170.00	100.00	105.00	175.00	100.00	100.00	245.00	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]	159	868	217	294	922	199	232	1372	137	279	1162	222
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	3.00	0.00	1.00	2.00	1.00	1.00	0.00	1.00	1.00	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	3	0	0	0	5	0	0	34	29
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	159	868	217	297	922	199	232	1377	137	279	1196	251
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	41	224	56	77	238	51	60	355	35	72	308	65
Total Analysis Volume [veh/h]	164	895	224	306	951	205	239	1420	141	288	1233	259
Pedestrian Volume [ped/h]	7			3			8			6		
Bicycle Volume [bicycles/h]	0			4			4			3		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.19	0.05	0.10	0.24	0.24	0.07	0.33	0.33	0.09	0.31	0.31
Intersection LOS	E											
Intersection V/C	0.949											

Generated with PTV VISTRO

Version 5.00-03

Intersection Level Of Service Report

Intersection 16: I-405 Southbound Off-Ramps & Spring Street

Control Type:	Signalized	Delay (sec / veh):	10.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.543

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	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	180.00	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			Yes			Yes			No		

Volumes

Name												
Base Volume Input [veh/h]	0	0	0	431	3	100	0	1324	10	0	1292	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	5.00	0.00	11.00	2.00	1.00	0.00	2.00	1.00	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	6	0	0	0	1	0	0	11	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	437	3	100	0	1325	10	0	1303	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	0.9100	0.9100	1.0000	1.0000	0.9100	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	109	1	27	0	331	3	0	326	0
Total Analysis Volume [veh/h]	0	0	0	437	3	110	0	1325	11	0	1303	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			3			0		
Bicycle Volume [bicycles/h]	0			0			1			1		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	30.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	0	0	0	4	0	0	2	0	0	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	0	10	0	0	17	0	0	17	0
Maximum Green [s]	0	0	0	0	30	0	0	50	0	0	50	0
Amber [s]	0.0	0.0	0.0	0.0	4.1	0.0	0.0	4.4	0.0	0.0	4.4	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	0	0	0	35	0	0	55	0	0	55	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	2.5	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Walk [s]	0	0	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	23	0	0	0	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	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	0.0	0.0	0.0	3.1	0.0	0.0	3.4	0.0	0.0	3.4	0.0
Minimum Recall					No			Yes			Yes	
Maximum Recall					No			No			No	
Pedestrian Recall					No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group		L	C	R	C	C	C
C, Cycle Length [s]		52	52	52	52	52	52
L, Total Lost Time per Cycle [s]		5.10	5.10	5.10	5.40	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		3.10	3.10	3.10	3.40	3.40	3.40
g_i, Effective Green Time [s]		10	10	10	31	31	31
g / C, Green / Cycle		0.20	0.20	0.20	0.60	0.60	0.60
(v / s)_i Volume / Saturation Flow Rate		0.14	0.14	0.08	0.39	0.40	0.40
s, saturation flow rate [veh/h]		1551	1630	1309	1693	1687	3224
c, Capacity [veh/h]		310	326	262	1016	1013	1935
d1, Uniform Delay [s]		19.51	19.51	18.35	6.93	6.95	7.05
k, delay calibration		0.08	0.08	0.08	0.15	0.15	0.15
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		2.06	1.96	0.80	1.04	1.05	0.59
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.69	0.69	0.42	0.66	0.66	0.67
d, Delay for Lane Group [s/veh]		21.57	21.47	19.15	7.97	8.00	7.63
Lane Group LOS		C	C	B	A	A	A
Critical Lane Group		Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]		2.36	2.47	1.11	3.54	3.55	3.37
50th-Percentile Queue Length [ft]		59.00	61.76	27.76	88.43	88.67	84.32
95th-Percentile Queue Length [veh]		4.25	4.45	2.00	6.37	6.38	6.07
95th-Percentile Queue Length [ft]		106.20	111.18	49.97	159.17	159.61	151.78

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	21.52	21.47	19.15	0.00	7.99	8.00	0.00	7.63	0.00
Movement LOS				C	C	B		A	A		A	
d_A, Approach Delay [s/veh]	0.00			21.04			7.99			7.63		
Approach LOS	A			C			A			A		
d_I, Intersection Delay [s/veh]	10.09											
Intersection LOS	B											
Intersection V/C	0.543											

Sequence

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

KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230

Project #: 21730
Project Name: 2300 Redondo Avenue
Analyst: HXA
Date: 10/16/2017
File: C:\Users\hahmed\Desktop\2300 Redondo Report\Signal Warrants\[21730 Signal Warrant Analysis_Int 4_CumP PM_20171020.xls]Data Input
Intersection: 4. Redondo Avenue/Project Driveway
Scenario: Existing Plus Project AM

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
7:45 AM	8:45 AM	1673	999	0	15
2nd Highest Hour		1584	946	0	14
3rd Highest Hour		1561	932	0	14
4th Highest Hour		1495	892	0	13
5th Highest Hour		1472	879	0	13
6th Highest Hour		1472	879	0	13
7th Highest Hour		1405	839	0	13
8th Highest Hour		1383	826	0	12
9th Highest Hour		1338	799	0	12
10th Highest Hour		1249	746	0	11
11th Highest Hour		1205	719	0	11
12th Highest Hour		1182	706	0	11
13th Highest Hour		1138	679	0	10
14th Highest Hour		981	586	0	9
15th Highest Hour		781	466	0	7
16th Highest Hour		736	440	0	7
17th Highest Hour		513	306	0	5
18th Highest Hour		424	253	0	4
19th Highest Hour		223	133	0	2
20th Highest Hour		156	93	0	1
21st Highest Hour		134	80	0	1
22nd Highest Hour		89	53	0	1
23rd Highest Hour		45	27	0	0
24th Highest Hour		45	27	0	0

Warrant Summary

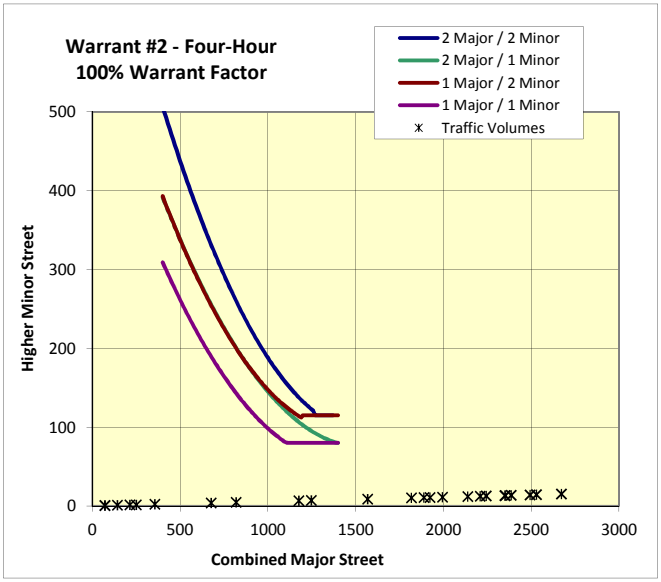
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

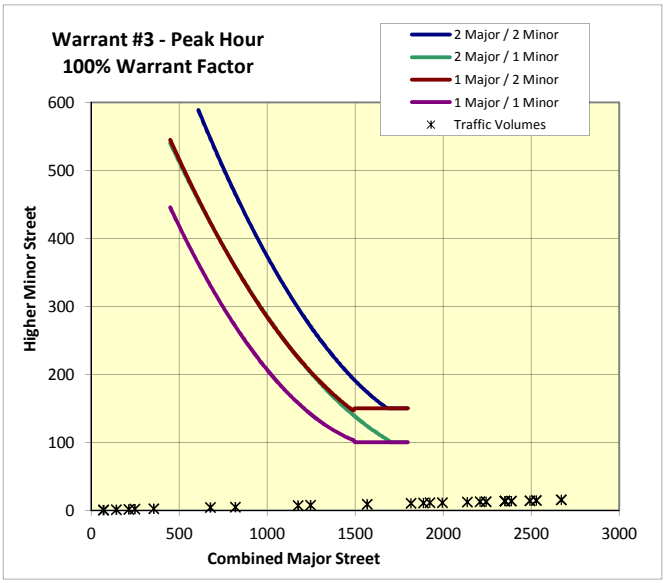
Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	89%
Major Street: 8th-Highest Hour / Peak Hour	83%
Minor Street: 4th-Highest Hour / Peak Hour	89%
Minor Street: 8th-Highest Hour / Peak Hour	83%

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	600	150	0	No	**No**
	B	900	75	0	No	
80%	A	480	120	0	No	**No**
	B	720	60	0	No	
70%	A	420	105	0	No	**No**
	B	630	53	0	No	
56%	A	336	84	0	No	**No**
	B	504	42	0	No	





KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230

Project #: 21730
Project Name: 2300 Redondo Avenue
Analyst: HXA
Date: 10/16/2017
File: C:\Users\hahmed\Desktop\2300 Redondo Report\Signal Warrants\[21730 Signal Warrant Analysis_Int 4_CumP PM_20171020.xls]Data Input
Intersection: 4. Redondo Avenue/Project Driveway
Scenario: Existing Plus Project PM

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
5:00 PM	6:00 PM	1255	1318	0	112
2nd Highest Hour		1188	1248	0	106
3rd Highest Hour		1171	1230	0	105
4th Highest Hour		1121	1177	0	100
5th Highest Hour		1104	1160	0	99
6th Highest Hour		1104	1160	0	99
7th Highest Hour		1054	1107	0	94
8th Highest Hour		1037	1090	0	93
9th Highest Hour		1004	1054	0	90
10th Highest Hour		937	984	0	84
11th Highest Hour		904	949	0	81
12th Highest Hour		887	931	0	79
13th Highest Hour		853	896	0	76
14th Highest Hour		736	773	0	66
15th Highest Hour		586	615	0	52
16th Highest Hour		552	580	0	49
17th Highest Hour		385	404	0	34
18th Highest Hour		318	334	0	28
19th Highest Hour		167	176	0	15
20th Highest Hour		117	123	0	10
21st Highest Hour		100	105	0	9
22nd Highest Hour		67	70	0	6
23rd Highest Hour		33	35	0	3
24th Highest Hour		33	35	0	3

Warrant Summary

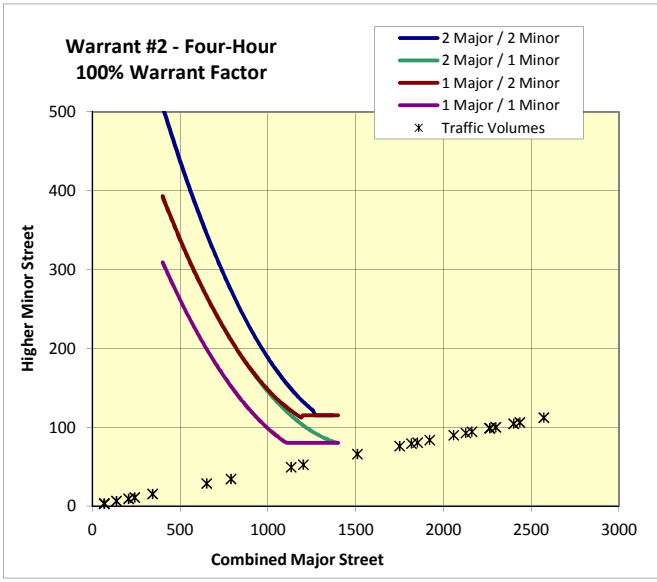
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

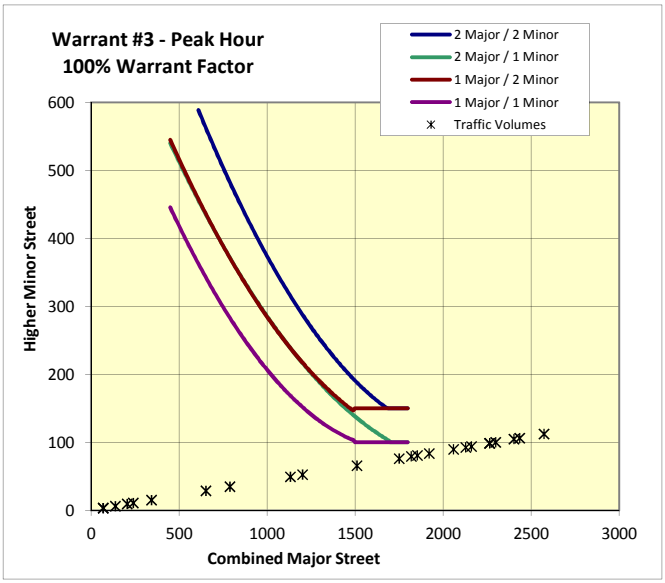
Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	89%
Major Street: 8th-Highest Hour / Peak Hour	83%
Minor Street: 4th-Highest Hour / Peak Hour	89%
Minor Street: 8th-Highest Hour / Peak Hour	83%

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	600	150	0	No	**Yes**
	B	900	75	13	Yes	
80%	A	480	120	0	No	**Yes**
	B	720	60	14	Yes	
70%	A	420	105	3	No	**Yes**
	B	630	53	15	Yes	
56%	A	336	84	10	Yes	**Yes**
	B	504	42	16	Yes	





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610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230

Project #: 21730
Project Name: 2300 Redondo Avenue
Analyst: HXA
Date: 10/16/2017
File: C:\Users\hahmed\Desktop\2300 Redondo Report\Signal Warrants\[21730 Signal Warrant Analysis_Int 4_CumP PM_20171020.xls]Data Input
Intersection: 5. Redondo Avenue/Industry Drive-Project Di
Scenario: Existing Plus Project AM

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
7:45 AM	8:45 AM	1742	863	46	14
2nd Highest Hour		1649	817	44	13
3rd Highest Hour		1626	805	43	13
4th Highest Hour		1556	771	41	13
5th Highest Hour		1533	759	40	12
6th Highest Hour		1533	759	40	12
7th Highest Hour		1463	725	39	12
8th Highest Hour		1440	713	38	12
9th Highest Hour		1394	690	37	11
10th Highest Hour		1301	644	34	10
11th Highest Hour		1254	621	33	10
12th Highest Hour		1231	610	33	10
13th Highest Hour		1185	587	31	10
14th Highest Hour		1022	506	27	8
15th Highest Hour		813	403	21	7
16th Highest Hour		766	380	20	6
17th Highest Hour		534	265	14	4
18th Highest Hour		441	219	12	4
19th Highest Hour		232	115	6	2
20th Highest Hour		163	81	4	1
21st Highest Hour		139	69	4	1
22nd Highest Hour		93	46	2	1
23rd Highest Hour		46	23	1	0
24th Highest Hour		46	23	1	0

Warrant Summary

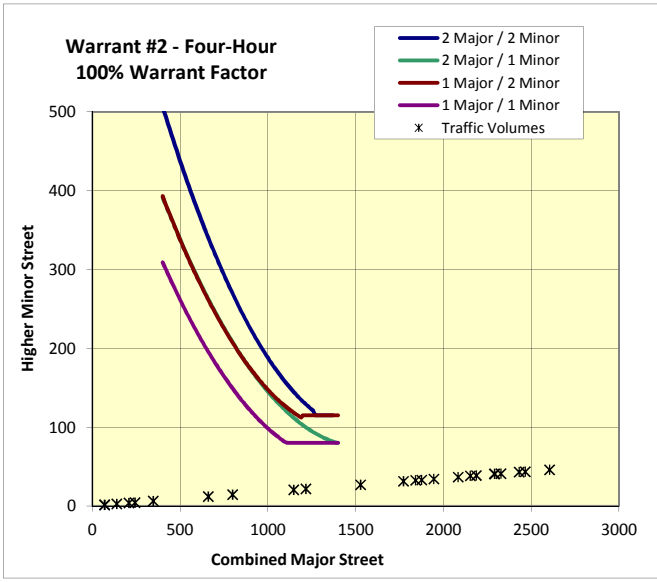
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

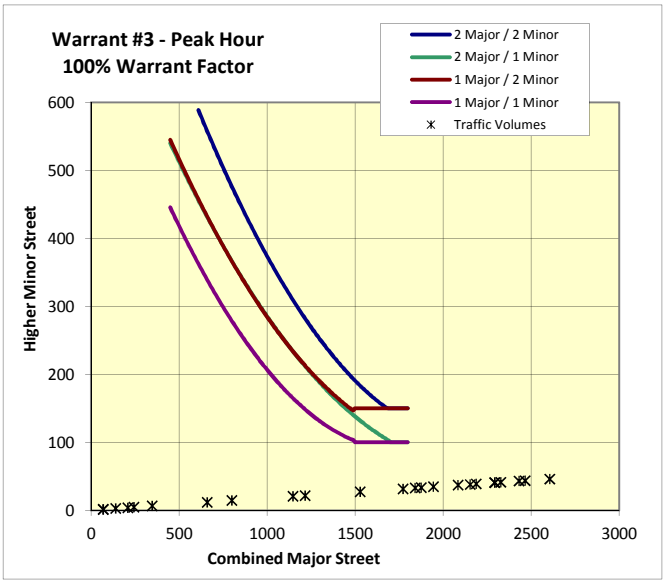
Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	89%
Major Street: 8th-Highest Hour / Peak Hour	83%
Minor Street: 4th-Highest Hour / Peak Hour	89%
Minor Street: 8th-Highest Hour / Peak Hour	83%

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	600	150	0	No	**No**
	B	900	75	0	No	
80%	A	480	120	0	No	**No**
	B	720	60	0	No	
70%	A	420	105	0	No	**No**
	B	630	53	0	No	
56%	A	336	84	0	No	**No**
	B	504	42	4	No	





KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230

Project #: 21730
Project Name: 2300 Redondo Avenue
Analyst: HXA
Date: 10/16/2017
File: C:\Users\hahmed\Desktop\2300 Redondo Report\Signal Warrants\[21730 Signal Warrant Analysis_Int 4_CumP PM_20171020.xls]Data Input
Intersection: 5. Redondo Avenue/Industry Drive-Project Di
Scenario: Existing Plus Project PM

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
5:00 PM	6:00 PM	1178	1327	87	108
2nd Highest Hour		1115	1256	82	102
3rd Highest Hour		1099	1239	81	101
4th Highest Hour		1052	1185	78	96
5th Highest Hour		1037	1168	77	95
6th Highest Hour		1037	1168	77	95
7th Highest Hour		990	1115	73	91
8th Highest Hour		974	1097	72	89
9th Highest Hour		942	1062	70	86
10th Highest Hour		880	991	65	81
11th Highest Hour		848	955	63	78
12th Highest Hour		832	938	61	76
13th Highest Hour		801	902	59	73
14th Highest Hour		691	779	51	63
15th Highest Hour		550	619	41	50
16th Highest Hour		518	584	38	48
17th Highest Hour		361	407	27	33
18th Highest Hour		298	336	22	27
19th Highest Hour		157	177	12	14
20th Highest Hour		110	124	8	10
21st Highest Hour		94	106	7	9
22nd Highest Hour		63	71	5	6
23rd Highest Hour		31	35	2	3
24th Highest Hour		31	35	2	3

Warrant Summary

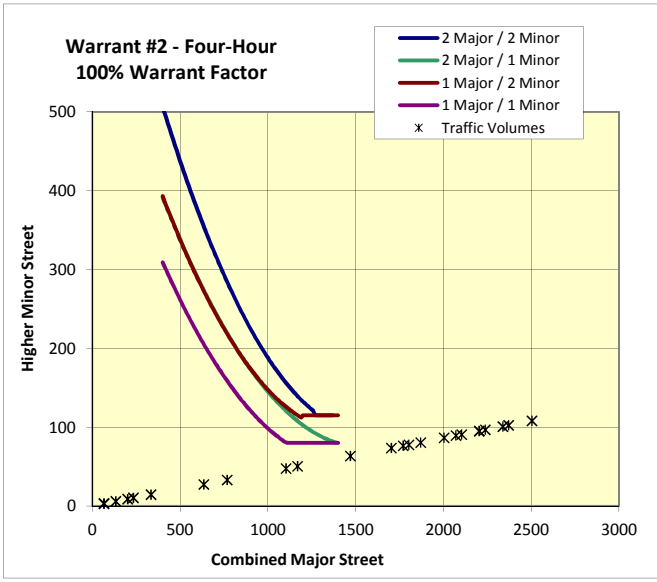
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

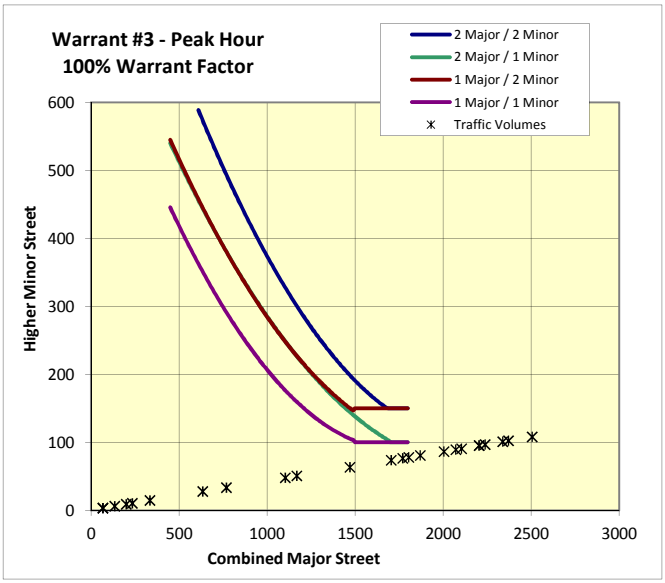
Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	89%
Major Street: 8th-Highest Hour / Peak Hour	83%
Minor Street: 4th-Highest Hour / Peak Hour	89%
Minor Street: 8th-Highest Hour / Peak Hour	83%

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	600	150	0	No	**Yes**
	B	900	75	12	Yes	
80%	A	480	120	0	No	**Yes**
	B	720	60	14	Yes	
70%	A	420	105	1	No	**Yes**
	B	630	53	14	Yes	
56%	A	336	84	9	Yes	**Yes**
	B	504	42	16	Yes	





Appendix G

LOS Worksheets – Existing Plus Project with Mitigation Conditions

Generated with PTV VISTRO
Version 5.00-03

Intersection Level Of Service Report
Intersection 2: Redondo Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.739

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	2	0	1	2	0	0	1	0	1	2	0	1
Pocket Length [ft]	175.00	100.00	150.00	145.00	100.00	100.00	190.00	100.00	190.00	160.00	100.00	160.00
Speed [mph]	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]	254	929	465	108	358	48	118	1020	159	196	1322	275
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	1.00	11.00	2.00	4.00	2.00	3.00	7.00	5.00	2.00	3.00
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]	11	9	16	0	55	0	0	0	100	83	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	265	938	481	108	413	48	118	1020	259	279	1322	275
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	70	249	128	29	110	13	31	271	69	74	352	73
Total Analysis Volume [veh/h]	282	998	512	115	439	51	126	1085	276	297	1406	293
Pedestrian Volume [ped/h]	5			3			0			2		
Bicycle Volume [bicycles/h]	3			0			1			0		

Intersection Settings

Cycle Length [s]	180
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.21	0.23	0.04	0.10	0.10	0.08	0.23	0.17	0.09	0.29	0.18
Intersection LOS	C											
Intersection V/C	0.739											

Generated with PTV VISTRO

Version 5.00-03

Intersection Level Of Service Report

Intersection 5: Redondo Avenue & Industry Drive

Control Type:	Signalized	Delay (sec / veh):	4.8
Analysis Method:	HCM 2010	Level Of Service:	A
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	1	0	0	1	0	0	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	150.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	45	1571	27	0	705	56	20	0	25	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	0.00	2.00	3.00	2.00	15.00	0.00	4.00	0.00	2.00	4.00
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	46	20	85	2	0	0	0	0	4	0	10
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	45	1617	47	85	707	56	20	0	25	4	0	10
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	1.0000	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	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	417	12	22	182	14	5	0	6	1	0	3
Total Analysis Volume [veh/h]	46	1667	48	88	729	58	21	0	26	4	0	10
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

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	4	0	3	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	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	89	0	0	89	0	0	11	0	0	11	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	5	0	0	5	0	0	5	0	0	5	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	C	L	C	C	C	L	C
C, Cycle Length [s]	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
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	85	85	85	85	85	85	7	7	7
g / C, Green / Cycle	0.85	0.85	0.85	0.85	0.85	0.85	0.07	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.07	0.51	0.51	0.35	0.24	0.24	0.04	0.00	0.01
s, saturation flow rate [veh/h]	617	1693	1676	255	1660	1618	1251	1266	1425
c, Capacity [veh/h]	555	1439	1425	244	1411	1375	140	85	100
d1, Uniform Delay [s]	2.55	2.28	2.30	8.14	1.48	1.48	44.94	49.10	43.55
k, delay calibration	0.50	0.50	0.50	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	1.00
d2, Incremental Delay [s]	0.29	1.83	1.88	4.12	0.50	0.51	6.40	1.03	2.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.08	0.60	0.60	0.36	0.28	0.28	0.34	0.05	0.10
d, Delay for Lane Group [s/veh]	2.85	4.12	4.18	12.26	1.98	2.00	51.34	50.14	45.55
Lane Group LOS	A	A	A	B	A	A	D	D	D
Critical Lane Group	No	No	Yes	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.20	2.97	2.99	1.11	0.87	0.85	1.37	0.12	0.29
50th-Percentile Queue Length [ft]	5.05	74.22	74.70	27.76	21.73	21.30	34.34	3.08	7.16
95th-Percentile Queue Length [veh]	0.36	5.34	5.38	2.00	1.56	1.53	2.47	0.22	0.52
95th-Percentile Queue Length [ft]	9.09	133.60	134.45	49.96	39.11	38.35	61.81	5.54	12.89

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	2.85	4.15	4.18	12.26	1.99	2.00	51.34	51.34	51.34	50.14	45.55	45.55
Movement LOS	A	A	A	B	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	4.11			3.02			51.34			46.86		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	4.80											
Intersection LOS	A											
Intersection V/C	0.548											

Sequence

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

Generated with PTV VISTRO
Version 5.00-03

Intersection Level Of Service Report
Intersection 11: Lakewood Boulevard & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.107

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	0	2	0	1	2	0	0
Pocket Length [ft]	175.00	100.00	100.00	140.00	100.00	100.00	175.00	100.00	300.00	150.00	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]	292	1336	207	105	1239	501	199	1097	134	98	1411	793
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	1.00	1.00	0.00	2.00	3.00	5.00	3.00	4.00	4.00	1.00	1.00
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	99	3	15	0	0	11	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	292	1336	207	105	1239	600	202	1112	134	98	1422	793
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	78	359	56	28	333	161	54	299	36	26	382	213
Total Analysis Volume [veh/h]	314	1437	223	113	1332	645	217	1196	144	105	1529	853
Pedestrian Volume [ped/h]	6			5			5			1		
Bicycle Volume [bicycles/h]	0			0			0			2		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.26	0.26	0.04	0.41	0.41	0.07	0.25	0.00	0.03	0.37	0.37
Intersection LOS	F											
Intersection V/C	1.107											

Generated with PTV VISTRO
Version 5.00-03

Intersection Level Of Service Report
Intersection 2: Redondo Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.885

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	2	0	1	2	0	0	1	0	1	2	0	1
Pocket Length [ft]	175.00	100.00	150.00	145.00	100.00	100.00	190.00	100.00	190.00	160.00	100.00	160.00
Speed [mph]	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]	209	583	408	271	641	124	68	1521	285	247	1030	122
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.00	1.00	1.00	1.00	2.00	6.00	3.00	1.00	1.00	1.00	1.00	4.00
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]	92	67	101	0	7	0	0	0	14	11	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	301	650	509	271	648	124	68	1521	299	258	1030	122
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	80	173	135	72	172	33	18	405	80	69	274	32
Total Analysis Volume [veh/h]	320	691	541	288	689	132	72	1618	318	274	1096	130
Pedestrian Volume [ped/h]	4			4			2			2		
Bicycle Volume [bicycles/h]	0			1			3			1		

Intersection Settings

Cycle Length [s]	180
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.14	0.25	0.09	0.17	0.17	0.05	0.34	0.20	0.09	0.23	0.08
Intersection LOS	D											
Intersection V/C	0.885											

Generated with PTV VISTRO
Version 5.00-03

Intersection Level Of Service Report
Intersection 5: Redondo Avenue & Industry Drive

Control Type:	Signalized	Delay (sec / veh):	7.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.534

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	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	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	150.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	33	1077	38	0	1197	47	31	0	54	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	1.00	0.00	0.00	1.00	0.00	3.00	0.00	0.00	0.00	2.00	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	4	12	46	0	0	0	0	20	0	88
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	1079	42	12	1243	47	31	0	54	20	0	88
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	1.0000	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	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	296	12	3	341	13	9	0	15	5	0	24
Total Analysis Volume [veh/h]	36	1186	46	13	1366	52	34	0	59	22	0	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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

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	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	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	48	0	0	48	0	0	12	0	0	12	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	5	0	0	5	0	0	5	0	0	5	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	C	L	C	C	C	L	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	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	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	44	44	44	44	44	44	8	8	8
g / C, Green / Cycle	0.73	0.73	0.73	0.73	0.73	0.73	0.13	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.11	0.37	0.37	0.03	0.42	0.42	0.11	0.02	0.07
s, saturation flow rate [veh/h]	336	1693	1671	413	1693	1671	828	1229	1425
c, Capacity [veh/h]	290	1242	1225	346	1242	1226	192	120	190
d1, Uniform Delay [s]	8.22	3.36	3.37	6.39	3.68	3.69	25.02	30.00	24.18
k, delay calibration	0.50	0.50	0.50	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	1.00
d2, Incremental Delay [s]	0.88	1.44	1.46	0.20	1.93	1.97	8.46	3.34	9.47
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.12	0.50	0.50	0.04	0.57	0.58	0.48	0.18	0.51
d, Delay for Lane Group [s/veh]	9.10	4.80	4.83	6.59	5.62	5.66	33.48	33.34	33.65
Lane Group LOS	A	A	A	A	A	A	C	C	C
Critical Lane Group	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	0.29	2.02	2.00	0.08	2.59	2.58	1.69	0.42	1.70
50th-Percentile Queue Length [ft]	7.17	50.50	50.10	2.06	64.66	64.39	42.30	10.50	42.58
95th-Percentile Queue Length [veh]	0.52	3.64	3.61	0.15	4.66	4.64	3.05	0.76	3.07
95th-Percentile Queue Length [ft]	12.91	90.91	90.19	3.71	116.39	115.90	76.14	18.90	76.65

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	9.10	4.81	4.83	6.59	5.64	5.66	33.48	33.48	33.48	33.34	33.65	33.65
Movement LOS	A	A	A	A	A	A	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	4.93			5.65			33.48			33.59		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	7.37											
Intersection LOS	A											
Intersection V/C	0.534											

Sequence

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

Generated with PTV VISTRO

Version 5.00-03

Intersection Level Of Service Report

Intersection 11: Lakewood Boulevard & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.009

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	2	0	0	2	0	0	2	0	1	2	0	0
Pocket Length [ft]	175.00	100.00	100.00	140.00	100.00	100.00	175.00	100.00	300.00	150.00	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]	198	1042	161	141	1309	278	317	1725	295	188	947	535
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	2.00	3.00	1.00	1.00	4.00	2.00	0.00	1.00	1.00	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	14	29	82	0	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]	198	1042	161	141	1309	292	346	1807	295	188	948	535
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	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	269	41	36	337	75	89	466	76	48	244	138
Total Analysis Volume [veh/h]	204	1074	166	145	1349	301	357	1863	304	194	977	552
Pedestrian Volume [ped/h]	4			6			7			2		
Bicycle Volume [bicycles/h]	2			1			2			2		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.19	0.19	0.05	0.34	0.34	0.11	0.39	0.13	0.06	0.24	0.24
Intersection LOS	F											
Intersection V/C	1.009											

Appendix H

LOS Worksheets – Cumulative (2019) Plus Project with Mitigation Conditions

Generated with PTV VISTRO

Version 5.00-03

Intersection Level Of Service Report

Intersection 2: Redondo Avenue & Willow Street

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

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	2	0	1	2	0	0	1	0	1	2	0	1
Pocket Length [ft]	175.00	100.00	150.00	145.00	100.00	100.00	190.00	100.00	190.00	160.00	100.00	160.00
Speed [mph]	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]	259	948	474	110	365	49	120	1040	162	200	1348	281
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	1.00	11.00	2.00	4.00	2.00	3.00	7.00	5.00	2.00	3.00
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]	11	9	16	0	55	0	0	0	100	83	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	270	957	490	110	420	49	120	1040	262	283	1348	281
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	72	255	130	29	112	13	32	277	70	75	359	75
Total Analysis Volume [veh/h]	287	1018	521	117	447	52	128	1106	279	301	1434	299
Pedestrian Volume [ped/h]	5			3			0			2		
Bicycle Volume [bicycles/h]	3			0			1			0		

Intersection Settings

Cycle Length [s]	180
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.21	0.23	0.04	0.10	0.10	0.08	0.23	0.17	0.09	0.30	0.19
Intersection LOS	C											
Intersection V/C	0.751											

Generated with PTV VISTRO

Version 5.00-03

Intersection Level Of Service Report

Intersection 5: Redondo Avenue & Industry Drive

Control Type:	Signalized	Delay (sec / veh):	5.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.561

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	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	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	150.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	46	1602	28	0	719	57	20	0	26	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	0.00	2.00	3.00	2.00	15.00	0.00	4.00	0.00	2.00	4.00
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	46	20	85	2	0	0	0	0	4	0	10
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	46	1648	48	85	721	57	20	0	26	4	0	10
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	1.0000	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	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	425	12	22	186	15	5	0	7	1	0	3
Total Analysis Volume [veh/h]	47	1699	49	88	743	59	21	0	27	4	0	10
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

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	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	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	70	0	0	70	0	0	10	0	0	10	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	5	0	0	5	0	0	5	0	0	5	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	C	L	C	C	C	L	C
C, Cycle Length [s]	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
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	66	66	66	66	66	66	6	6	6
g / C, Green / Cycle	0.83	0.83	0.83	0.83	0.83	0.83	0.08	0.08	0.08
(v / s)_i Volume / Saturation Flow Rate	0.08	0.52	0.52	0.36	0.24	0.24	0.04	0.00	0.01
s, saturation flow rate [veh/h]	608	1693	1676	247	1660	1618	1191	1265	1425
c, Capacity [veh/h]	542	1397	1383	241	1370	1335	154	98	107
d1, Uniform Delay [s]	2.86	2.54	2.56	9.46	1.62	1.62	35.68	39.63	34.47
k, delay calibration	0.50	0.50	0.50	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	1.00
d2, Incremental Delay [s]	0.32	2.14	2.20	4.25	0.55	0.57	5.20	0.78	1.73
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.09	0.63	0.63	0.37	0.30	0.30	0.31	0.04	0.09
d, Delay for Lane Group [s/veh]	3.17	4.67	4.75	13.71	2.17	2.19	40.88	40.42	36.20
Lane Group LOS	A	A	A	B	A	A	D	D	D
Critical Lane Group	No	No	Yes	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.19	2.65	2.67	1.08	0.75	0.74	1.11	0.10	0.23
50th-Percentile Queue Length [ft]	4.78	66.22	66.83	26.88	18.77	18.42	27.81	2.46	5.73
95th-Percentile Queue Length [veh]	0.34	4.77	4.81	1.94	1.35	1.33	2.00	0.18	0.41
95th-Percentile Queue Length [ft]	8.60	119.20	120.29	48.38	33.78	33.16	50.07	4.42	10.32

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	3.17	4.71	4.75	13.71	2.18	2.19	40.88	40.88	40.88	40.42	36.20	36.20
Movement LOS	A	A	A	B	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	4.67			3.32			40.88			37.40		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	5.03											
Intersection LOS	A											
Intersection V/C	0.561											

Sequence

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

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Intersection Level Of Service Report

Intersection 11: Lakewood Boulevard & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.126

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	0	2	0	1	2	0	0
Pocket Length [ft]	175.00	100.00	100.00	140.00	100.00	100.00	175.00	100.00	300.00	150.00	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]	298	1363	211	107	1264	511	203	1119	137	100	1439	809
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	1.00	1.00	0.00	2.00	3.00	5.00	3.00	4.00	4.00	1.00	1.00
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	99	3	15	0	0	11	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	298	1363	211	107	1264	610	206	1134	137	100	1450	809
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	80	366	57	29	340	164	55	305	37	27	390	217
Total Analysis Volume [veh/h]	320	1466	227	115	1359	656	222	1219	147	108	1559	870
Pedestrian Volume [ped/h]	6			5			5			1		
Bicycle Volume [bicycles/h]	0			0			0			2		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.26	0.26	0.04	0.42	0.42	0.07	0.25	0.00	0.03	0.38	0.38
Intersection LOS	F											
Intersection V/C	1.126											

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Intersection Level Of Service Report
Intersection 2: Redondo Avenue & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.899

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	2	0	1	2	0	0	1	0	1	2	0	1
Pocket Length [ft]	175.00	100.00	150.00	145.00	100.00	100.00	190.00	100.00	190.00	160.00	100.00	160.00
Speed [mph]	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]	213	595	416	276	654	126	69	1551	291	252	1051	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.00	1.00	1.00	1.00	2.00	6.00	3.00	1.00	1.00	1.00	1.00	4.00
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]	92	67	101	0	7	0	0	0	14	11	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	305	662	517	276	661	126	69	1551	305	263	1051	124
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	81	176	138	73	176	34	18	413	81	70	280	33
Total Analysis Volume [veh/h]	324	704	550	294	703	134	73	1650	324	280	1118	132
Pedestrian Volume [ped/h]	4			4			2			2		
Bicycle Volume [bicycles/h]	0			1			3			1		

Intersection Settings

Cycle Length [s]	180
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.15	0.26	0.09	0.17	0.17	0.05	0.34	0.20	0.09	0.23	0.08
Intersection LOS	D											
Intersection V/C	0.899											

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Intersection Level Of Service Report

Intersection 5: Redondo Avenue & Industry Drive

Control Type:	Signalized	Delay (sec / veh):	7.5
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.546

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	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	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	150.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	34	1099	39	0	1221	48	32	0	55	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	1.00	0.00	0.00	1.00	0.00	3.00	0.00	0.00	0.00	2.00	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	4	12	46	0	0	0	0	20	0	88
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	1101	43	12	1267	48	32	0	55	20	0	88
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	1.0000	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	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	302	12	3	348	13	9	0	15	5	0	24
Total Analysis Volume [veh/h]	37	1210	47	13	1392	53	35	0	60	22	0	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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

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	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	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	48	0	0	48	0	0	12	0	0	12	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	5	0	0	5	0	0	5	0	0	5	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	C	L	C	C	C	L	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	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	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	44	44	44	44	44	44	8	8	8
g / C, Green / Cycle	0.73	0.73	0.73	0.73	0.73	0.73	0.13	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.11	0.37	0.37	0.03	0.43	0.43	0.12	0.02	0.07
s, saturation flow rate [veh/h]	327	1693	1671	404	1693	1671	819	1228	1425
c, Capacity [veh/h]	283	1242	1225	338	1242	1226	191	120	190
d1, Uniform Delay [s]	8.50	3.40	3.41	6.54	3.73	3.74	25.17	30.00	24.18
k, delay calibration	0.50	0.50	0.50	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	1.00
d2, Incremental Delay [s]	0.95	1.49	1.52	0.21	2.02	2.06	8.94	3.34	9.47
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.13	0.51	0.51	0.04	0.58	0.59	0.50	0.18	0.51
d, Delay for Lane Group [s/veh]	9.45	4.90	4.93	6.75	5.75	5.81	34.11	33.34	33.65
Lane Group LOS	A	A	A	A	A	A	C	C	C
Critical Lane Group	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	0.30	2.09	2.07	0.08	2.68	2.67	1.75	0.42	1.70
50th-Percentile Queue Length [ft]	7.58	52.24	51.84	2.10	66.99	66.76	43.63	10.50	42.58
95th-Percentile Queue Length [veh]	0.55	3.76	3.73	0.15	4.82	4.81	3.14	0.76	3.07
95th-Percentile Queue Length [ft]	13.64	94.02	93.32	3.78	120.59	120.17	78.54	18.90	76.65

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	9.45	4.91	4.93	6.75	5.78	5.81	34.11	34.11	34.11	33.34	33.65	33.65
Movement LOS	A	A	A	A	A	A	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	5.04			5.79			34.11			33.59		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	7.49											
Intersection LOS	A											
Intersection V/C	0.546											

Sequence

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

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Intersection Level Of Service Report

Intersection 11: Lakewood Boulevard & Willow Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.026

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	0	2	0	1	2	0	0
Pocket Length [ft]	175.00	100.00	100.00	140.00	100.00	100.00	175.00	100.00	300.00	150.00	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]	202	1063	164	144	1335	284	323	1760	301	192	966	546
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	2.00	3.00	1.00	1.00	4.00	2.00	0.00	1.00	1.00	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	14	29	82	0	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]	202	1063	164	144	1335	298	352	1842	301	192	967	546
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	52	274	42	37	344	77	91	475	78	49	249	141
Total Analysis Volume [veh/h]	208	1096	169	148	1376	307	363	1899	310	198	997	563
Pedestrian Volume [ped/h]	4			6			7			2		
Bicycle Volume [bicycles/h]	2			1			2			2		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	18.00

Phasing & Timing

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

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.20	0.20	0.05	0.35	0.35	0.11	0.40	0.13	0.06	0.24	0.24
Intersection LOS	F											
Intersection V/C	1.026											