HEXAGON TRANSPORTATION CONSULTANTS, INC.

530 Front Street Mixed-Use Development

Transportation Impact Analysis

Prepared for:

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Executive Summary

This report presents the results of the traffic impact analysis for the proposed mixed-use development at 530 Front Street in Santa Cruz, California (see Figure 1). The project proposes to replace the existing office, restaurant, and retail buildings with a eight-story mixed-use development comprised of 4,583 square feet of retail use, 676 gross square feet of café use, and 2,286 square feet of restaurant use on the ground and second floor. The second floor through eighth floor would have 276 residential units, which consists of 116 micro apartments, 53 studio apartments, 102 1-bedroom apartments, and 5 2-bedroom apartments. Parking would be provided via an on-site garage.

The study includes an evaluation of intersection levels of service and also includes an evaluation of potential impacts to bicycle, pedestrian, and transit facilities, and a review of site access, on-site circulation, and parking demand.

Project Trip Estimates

The magnitude of traffic added to the roadway system by a particular development is estimated by multiplying the applicable trip generation rates by the size of the development. The trip generation rates published in the Institute of Transportation Engineers' (ITE) manual entitled *Trip Generation, 10th Edition* (2017) were used for this analysis. The rates published for Multifamily Housing – Mid-Rise (Land Use 221), Office Building (Land Use 710), Shopping Center (Land Use 820), and Quality Restaurant (Land Use 931) were used to estimate the trips generated by the proposed mixed-use project. The rate for the café was based on previous café applications in the City Santa Cruz. Based on these rates, the proposed project would generate 1,907 daily trips with 112 trips during the AM peak hour and 159 trips during the PM peak hour.

The existing office, restaurant, and retail uses can be credited against the proposed mixed-use development. The existing buildings' trip generation estimates are based on the average rates published by ITE. Based on the ITE rates, it is estimated that the existing buildings generate 888 daily trips with 10 trips during the AM peak hour and 85 trips during the PM peak hour.

The City of Santa Cruz allows a 40 percent trip reduction for mixed-use development in Downtown Santa Cruz to account for internal capture, walkability, bike-ability, and the existing Metro Transit Center as part of the City of Santa Cruz *Downtown Plan Amendment (DPA), July 2017*. Thus, a 40 percent reduction was applied to the proposed trip generation estimates.

After accounting for the trips generated by the existing businesses, the proposed mixed-use project is estimated to generate 611 new daily trips with a net increase of 61 trips in the AM peak hour and a net increase of 45 trips in the PM peak hour.

Intersection Levels of Service

Existing Plus Project Intersection Level of Service

The intersection level of service analysis results show that all study intersections would operate at acceptable levels of service during both AM and PM peak hours under existing plus project conditions. It should be noted that, at some study intersections, the average delay under project conditions is shown to be better than under no-project conditions. This occurs because the project would result in a reduction in traffic for several of the intersection movements.

Cumulative Intersection Levels of Service

The results of the level of service analysis under cumulative conditions show that the following intersections would operate at unacceptable levels of service during the PM peak hour, both with and without the project:

- Front Street & Soquel Avenue
- Front Street & Laurel Street

The project would contribute traffic to these deficient intersections.

Mitigation Measures

The Downtown Plan Amendments EIR has identified several roadway improvements for which the costs would be covered by anticipated future development projects. Estimated engineering costs for these improvements were estimated, and the 530 Front Street's fair share payment was calculated based on its cumulative impacts caused at the study intersections.

The project's fair share is estimated to be 13.31%. This is based on the 45 PM peak hour project trips divided by the Downtown Plan Amendments' 293 PM peak hour net new trips plus the project's PM peak hour net new trips (45/338 = 13.31%).

Front Street and Soquel Avenue

Mitigation: The significant cumulative impact at this intersection could be mitigated by adding a second westbound left-turn lane. The centerline median would be shifted south, and the east leg would be reduced to one through lane between Front Street and River Street. The westbound shared through-left lane would be converted into a through-lane. The signal timing and phasing would be optimized.

The cost for the construction of this improvement is estimated to be $599,000 based on the 508 Front Street TIA study. With this improvement, the intersection would operate at an acceptable LOS D during the PM peak hour.

Front Street and Laurel Street

Mitigation: The significant cumulative impact at this intersection could be mitigated by converting the westbound right-turn lane into a shared through-right lane. The west leg would be widened to provide a receiving lane between Pacific Avenue and Front Street, relocating sidewalk, utilities, and landscaping. A right-turn overlap phase would be provided for the northbound and southbound approaches.

The cost for the construction of this improvement is estimated to be $599,000 based on the 508 Front Street TIA study. With this improvement, the intersection would operate at an acceptable LOS D during the PM peak hour.

Pacific Avenue and Laurel Street

Impact: Although this intersection was not included in this study, the addition of project traffic to this intersection would continue to operate at LOS E during Cumulative Plus Project conditions based on the 508 Front Street TIA study. This constitutes a significant impact according to the thresholds established by the City of Santa Cruz.

Mitigation: The significant cumulative impact at this intersection could be mitigated by the construction of a southbound left-turn lane and removing the existing landscape median.

The estimated engineering cost for the construction of this improvement is estimated to be approximately $313,000 based on the 508 Front Street TIA study. With this improvement, the intersection would operate at an acceptable LOS D during the PM peak hour.

Front Street Improvements

Under the direction of the City of Santa Cruz, a continuous two-way left-turn lane (TWLTL) along Front Street would be implemented that could be used by inbound and outbound traffic from all driveways. The TWLTL would extend from Soquel Avenue to Laurel Street. With the implementation of this continuous two-way left-turn lane, on-street parking on both sides of the street would be eliminated. Continuous Class bike lanes and Class II buffered bike lanes would be provided with the restriping of Front Street.

The cost to construct these improvements is estimated to be $169,000 based on the 508 Front Street TIA study.

Project Driveway Access

An analysis of the southbound left-turn movement at the project driveway was conducted to determine if the project would cause any operational issues. The project driveway would be on Front Street approximately 300 feet south of Soquel Avenue. Front Street is a two-way, north-south street with two lanes in the south direction and one lane in the north direction at the project driveway. Front Street is divided by a solid double yellow line. Front Street does not have a left turn lane for the southbound direction for vehicles turning left into the project site. Thus, vehicles turning left would have to stop in the center-most southbound through lane and wait for a gap in the opposing traffic.

The vehicle queuing analysis for the southbound left-turn movement into the project driveway was also conducted. The estimated 95th percentile queue for the vehicles turning left from southbound Soquel Avenue into the project driveway is approximately 75 feet (3 vehicles) in the AM peak hour and 100 feet (4 vehicles) in the PM peak hour. The total storage provided between the project driveway and Soquel Avenue at the inner most southbound lane is approximately 300 feet (6 vehicles). Thus, the southbound left-turn traffic into the project driveway should not impact the two through lanes of traffic along southbound Soquel Avenue.

A pedestrian warning device is recommended at the driveway exit to alert pedestrians of outgoing vehicles.

Parking

The proposed project would provide affordable and lower-income units. In addition, the development is located is located within one-mile of a major transit stop and has unobstructed access to the major

transit stop. Thus, the State Density Law's reduced parking ratios apply to the project, if so requested by the project applicant.

Under the State Density Bonus Law, the project would need to provide 141 parking spaces.

The project also proposes restaurant and retail uses on the site. The project proposes to construct 2,286 square feet of restaurant use and 5,259 square feet of retail use. Since the project is located in Parking District #1, the vehicle requirement for restaurant and retail uses is 1 parking space per 400 square feet. Therefore, the project is required to provide a minimum of 19 parking spaces for restaurant and retail uses. Thus, the total required parking is 160 spaces.

The project is proposing 185 spaces, which exceeds the minimum parking requirement. It is assumed that some vehicles traveling to this location for the restaurant and commercial uses would utilize the public lots and garages within the area, with the nearest public parking garage located at the northwest corner of Front Street and Soquel Avenue.

According to the Santa Cruz Municipal Code, bicycle parking facilities are required for new buildings, additions or enlargements of an existing building, or for any change in the occupancy, except when the project property is located within Parking District #1. Since the project is located within Parking District #1, bicycle parking facilities are not required. However, the project provides bicycle parking and follows the bicycle parking requirements from the Santa Cruz Municipal Code. The bicycle parking requirement for a multifamily residential use is 1 space per unit with all of the bicycle spaces being long-term bicycle spaces. The project proposes 271 units, with 5 2-bedroom units. Therefore, the project would need to provide 276 long-term bicycle spaces. According to the site plan, the project proposes to provide 233 bicycle parking spaces.

Vehicle Miles Traveled (VMT) Analysis

Based on the California T Travel Model, the City daily VMT per capita is 11.04, and the County VMT per capita is 15.41. The City daily VMT per employee is 20.06, and the County VMT per employee is 22.09.

Since the City daily VMT per capita (11.04) is less than 85% of the County daily VMT per capita, it can be assumed that the residential portion of the project will have a less-than significant VMT impact.

For the purpose of VMT evaluation, the trip estimates for the retail portion of the project site were treated as local-serving retail land use. According to the Governor's Office of Planning and Research (OPR) Technical Advisory Guidelines, retail development less than 50,000 square feet can be considered local-serving retail. The project proposes a 3,012 square feet of retail use on the ground floor, 2,286 square feet of restaurant use and 2,247 square feet of retail use on the second floor, which totals to 7,545 square feet. Therefore, it is assumed that local-serving retail projects will have a less-than significant VMT impact.

Table ES 1
Intersection Level of Service Summary

#	Intersection	Control	Peak Hour	Count Date	Note	Existing Avg. Delay (sec)	Existing LOS	Existing plus Project Avg. Delay (sec)	Existing plus Project LOS	Incr. in Avg. Delay	Year 2030 no Project Conditions Avg. Delay (sec)	Year 2030 no Project Conditions Avg. Delay (sec)	Year 2030 no Project Conditions LOS	Year 2030 Plus Project Conditions Avg. Delay (sec)	Year 2030 Plus Project Conditions LOS	Mitigated Year 2030 Plus Project Avg. Delay (sec)	Mitigated Year 2030 Plus Project LOS
1	Front Street & Soquel Avenue[4]	Signal	AM	05/14/19		31.6	C	31.8	C	0.2		-	-	-	-	-	-
			PM	05/14/19		31.3	C	31.3	C	0.0	**66.7**	**66.7**	**E**	**75.3**	**E**	54.5	D
2	River Street & Soquel Avenue[1 2 3]	Signal	AM	05/14/19		10.4	B	10.4	B	0.0		-	-	-	-	-	-
			PM	05/14/19		9.8	A	9.8	A	0.0	11.6	11.6	B	11.7	B	-	-
3	Front Street & Cathcart Street[4]	Signal	AM	05/14/19	*	15.0	B	15.1	B	0.1		-	-	-	-	-	-
			PM	05/14/19	*	17.5	B	17.5	B	0.0	29.0	29.0	C	29.0	C	-	-
4	Front Street & Laurel Street[4]	Signal	AM	05/14/19		23.3	C	23.6	C	0.3		-	-	-	-	-	-
			PM	05/14/19		26.0	C	27.4	C	1.4	**67.9**	**67.9**	**E**	**69.6**	**E**	54.4	D
5	Front Street & Cooper Street[1 2 3]	Signal	AM	05/14/19		5.4	A	5.3	A	-0.1		-	-	-	-	-	-
			PM	05/14/19		6.2	A	6.1	A	-0.1	8.8	8.8	A	8.8	A	-	-
6	River Street & Water Street[1 2 3]	Signal	AM	05/14/19		22.2	C	22.2	C	0.0		-	-	-	-	-	-
			PM	05/14/19		29.6	C	29.8	C	0.2	53.1	53.1	D	53.8	D	-	-
7	Pacific Avenue/Front Street & Mission Street/Water Street[1 2 3]	Signal	AM	05/14/19	*	19.5	B	19.5	B	0.0		-	-	-	-	-	-
			PM	05/14/19	*	20.6	C	20.6	C	0.0	32.0	32.0	C	32.0	C	-	-

Notes:

* indicates the intersection level of service is calculated using the HCM 2000 module with the Synchro software. These intersections have unusual lane geometries that cannot be supported by the Synchro HCM 6th Edition module.

Bold indicates substandard level of service.

1. Year 2030 conditions intersection level of service results are based on results published in the City of Santa Cruz Critical Intersections and General Plan Buildout Traffic Volumes - Transportation Impact Study Guidelines.
2. Year 2030 intersection level of service results for these intersections were not reported in the Critical Intersections and General Plan Buildout document. Volumes at these intersections were used to analyze resulting Year 2030 LOS results using Synchro.
3. 2030 General Plan volumes were supplied only for the PM peak hour.
4. Year 2030 conditions intersection level of service results are based on cumulative plus project volumes from the 508 Front Street traffic study.

1. Introduction

This report presents the results of the traffic impact analysis for the proposed mixed-use development at 530 Front Street in Santa Cruz, California (see Figure 1). The project proposes to replace the existing office, restaurant, and retail buildings with a eight-story mixed-use development comprised of 4,583 square feet of retail use 676 gross square feet of café use, and 2,286 square feet of restaurant use on the ground and second floor. The second floor through eighth floor would have 276 residential units, which consists of 116 micro apartments, 53 studio apartments, 102 1-bedroom apartments, and 5 2-bedroon apartments. Parking would be provided via an on-site garage. The proposed site plan is shown on Figure 2.

Scope of Study

The purpose of the traffic analysis is to satisfy the requirements of the City of Santa Cruz. The traffic analysis includes an analysis of weekday AM and PM peak-hour traffic conditions and determines the traffic impacts of the proposed mixed-use development on key intersections in the vicinity of the site. The key intersections are identified below.

- Front Street and Soquel Avenue
- River Street and Soquel Avenue
- Front Street and Cathcart Street
- Front Street and Laurel Street
- Front Street and Cooper Street
- River Street and Water Street
- Pacific Avenue/Front Street and Mission Street/Water Street

Traffic conditions at the study intersections were analyzed for the weekday AM and PM peak hours of traffic. Locally, the AM peak hour of traffic is between 7:00 and 9:00 AM, and the PM peak hour is between 4:00 and 6:00 PM. It is during these periods that the most congested traffic conditions occur on an average weekday.

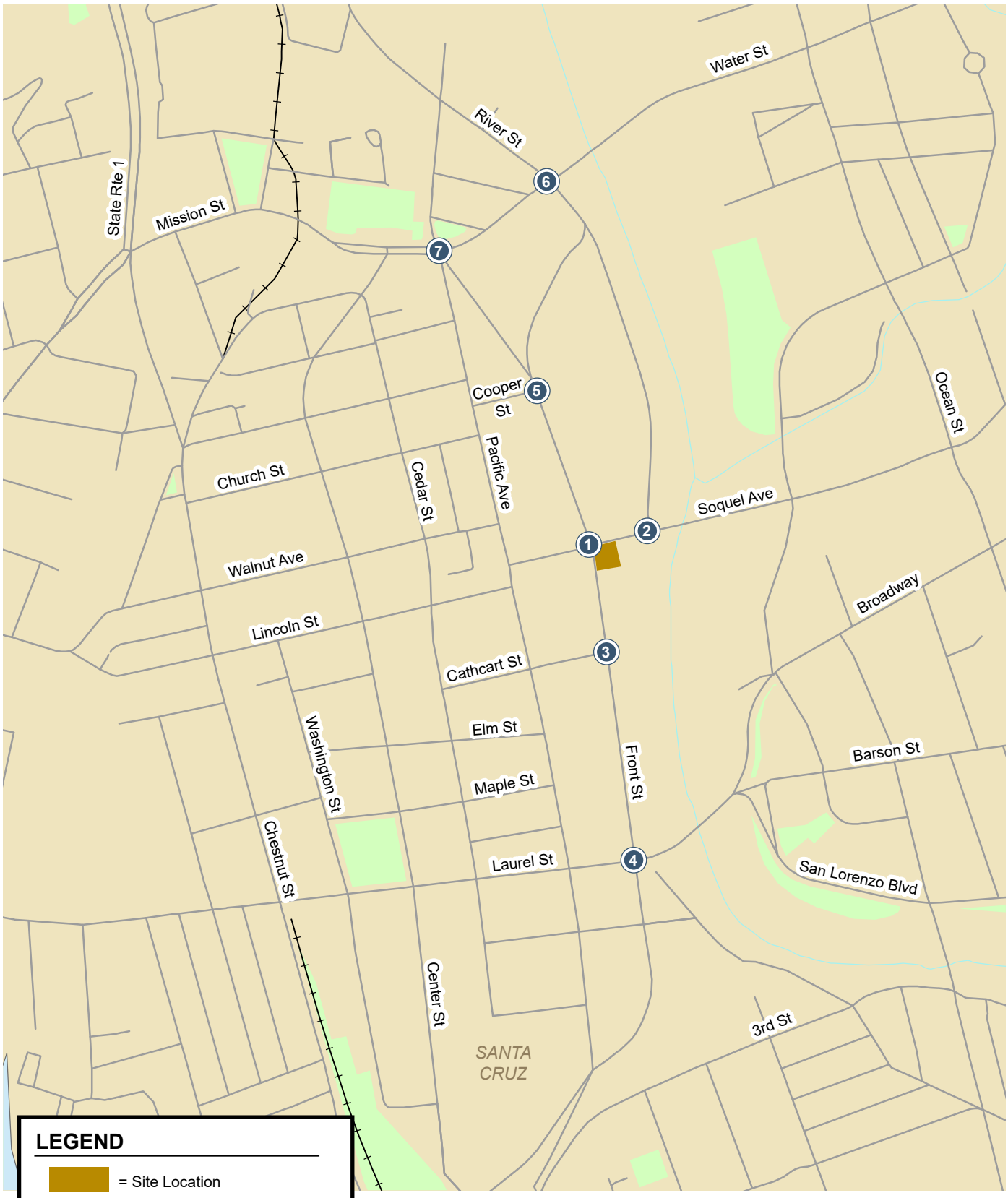


Figure 1
Site Location and Study Intersections

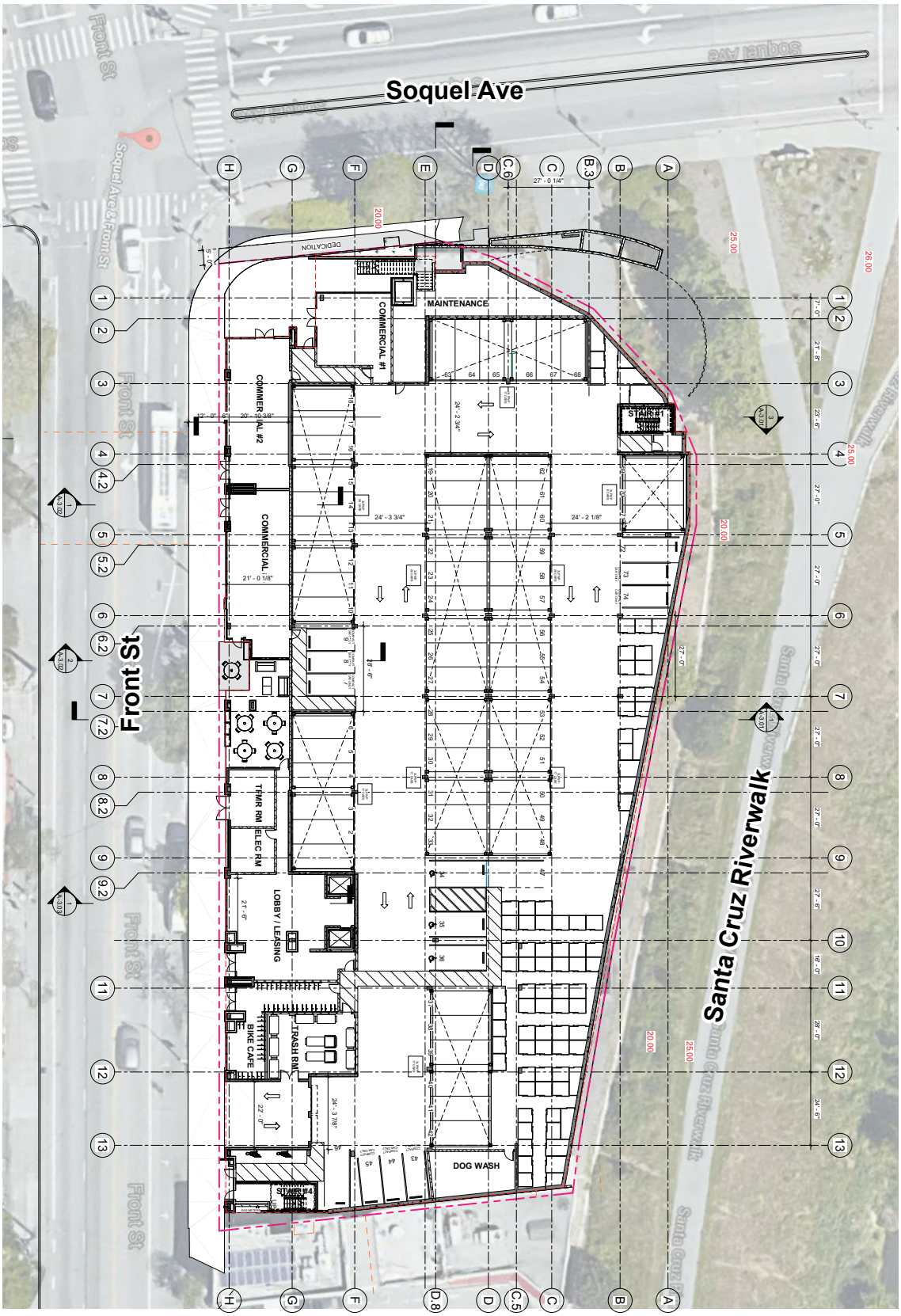


Figure 2
Site Plan

NORTH
Not to Scale

The study also includes an evaluation of potential impacts to bicycle, pedestrian, and transit facilities, and a review of site access, on-site circulation, and parking demand.

Traffic conditions were evaluated for the following scenarios:

- ***Existing Conditions.*** Existing AM and PM peak-hour traffic volumes at study intersections were based on new traffic counts collected in May 2019.
- ***Existing Plus Project Conditions.*** Existing plus project conditions reflect the projected traffic volumes on the existing roadway network with completion of the project. Existing plus project traffic volumes were estimated by adding to existing traffic counts the additional traffic generated by the project.
- ***Cumulative Conditions (PM Only).*** Cumulative traffic volumes were based on the buildout of the City of Santa Cruz 2030 General Plan. A list of peak-hour traffic volumes in the vicinity was provided by the City of Santa Cruz. The City General Plan was only developed for the PM peak hour, which represents the worst-case analysis. The PM peak hour volumes are typically higher than the AM hour. Cumulative plus project traffic volumes from the 508 Front Street traffic study were used for 3 study intersections: Front Street/Soquel Avenue, Front Street/Cathcart Street, and Front Street/Laurel Street
- ***Cumulative Plus Project Conditions (PM Only).*** Cumulative traffic volumes were estimated by adding the project traffic to the volumes generated by buildout of the City of Santa Cruz 2030 General Plan and the 508 Front Street traffic study. A list of peak-hour traffic volumes in the vicinity was provided by the City of Santa Cruz.

Methodology

This section presents the methods used to determine the traffic conditions for each scenario described above and the traffic impacts of the project. It includes descriptions of the data requirements, the analysis methodologies, and the applicable level of service standards.

Data Requirements

The data required for the analysis were obtained from new traffic counts, field observations, and the City of Santa Cruz. The following data were collected from these sources:

- Intersection traffic volumes,
- Intersection lane configurations, and
- Intersection signal timing and phasing.

Analysis Methodologies

Signalized Intersection Level of Service

Traffic conditions at the study intersections were evaluated using level of service (LOS). Level of service is a qualitative description of operating conditions ranging from LOS A, or free-flow conditions with little or no delay, to LOS F, or jammed conditions with excessive delays.

The City of Santa Cruz evaluates intersection levels of service using the Synchro software, which is based on the Highway Capacity Manual (HCM) 6th Edition method for signalized intersections. The *HCM 6th Edition* method evaluates signalized intersection operations on the basis of average control delay time for all vehicles at the intersection. This average delay can then be correlated to a level of service. The City of Santa Cruz level of service standard for signalized study intersections is LOS D or better. Table 1 presents the level of service definitions for signalized intersections.

Table 1
Signalized Intersection Level of Service Definitions Based on Delay

Level of Service	Description	Average Control Delay Per Vehicle (sec.)
A	Signal progression is extremely favorable. Most Vehicles arrive during the green phase and do not stop at all. Short cycle lengths may also contribute to the very low vehicle delay.	10.0 or less
B+ B B-	Operations characterized by good signal progression and/or short cycle lengths. More vehicles stop than with LOS A, causing higher levels of average vehicle delay.	10.1 to 12.0 12.1 to 18.0 18.1 to 20.0
C+ C C-	Higher delays may result for fair signal progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, though may still pass through the intersection without stopping.	20.1 to 23.0 23.1 to 32.0 32.1 to 35.0
D+ D D-	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable signal progression, long cycle lengths, or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 39.0 39.1 to 51.0 51.1 to 55.0
E+ E E-	This is considered to be the limit of acceptable delay. These high delay values generally indicate poor signal progression, long cycle lengths, and high volume-to-capacity (V/C) ratios. Individual cycle failures occur frequently.	55.1 to 60.0 60.1 to 75.0 75.1 to 80.0
F	The level of delay is considered unacceptable by most drivers. This condition often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. Poor progression and long cycle lengths may also be major contributing causes of such delay levels.	greater than 80.0

Source: Transportation Research Board, 2000 Highway Capacity Manual (Washington, D.C., 2000) p10-16.

Vehicle Queuing

The queuing analysis is used to determine the appropriate storage lengths for the high demand turn lanes where the project would add a substantial number of trips. Vehicle queues were estimated using a Poisson probability distribution, which estimates the probability of "n" vehicles for a vehicle movement using the following formula:

$$\text{Probability } (X=n) = \frac{\lambda^n e^{-(\lambda)}}{n!}$$

Where:

Probability (X=n) = probability of "n" vehicles in queue per lane
n = number of vehicles in the queue per lane
λ = Average number of vehicles in queue per lane (vehicles per hour per lane/signal cycles per hour)

The basis of the analysis is as follows: (1) the Poisson probability distribution is used to estimate the 95th percentile maximum number of queued vehicles per signal cycle for a particular movement; (2) the estimated maximum number of vehicles in the queue is translated into a queue length, assuming 25 feet per vehicle; and (3) the estimated maximum queue length is compared to the existing or planned available storage capacity for the movement. This analysis thus provides a basis for estimating future storage requirements at intersections.

Significant Impact Criteria

Significance criteria are used to establish what constitutes an impact. For this analysis, the criteria used to determine significant impacts on signalized intersections are based on City of Santa Cruz Level of Service standards. Impacts to pedestrian and bicycle facilities and transit services were evaluated based on the City of Santa Cruz Transportation Impact Study (TIS) Guidelines (October 2017) and professional judgment.

City of Santa Cruz Signalized Intersections

According to City of Santa Cruz level of service standard, a development is said to create a significant impact on traffic conditions at a signalized intersection if:

1. The level of service at the intersection drops below its respective level of service standard (LOS D or better) when project traffic is added, or
2. The project traffic together with General Plan traffic would result in a drop below the level of service standard (LOS D). (This is defined as a cumulatively considerable effect), or
3. The project traffic would change the peak hour level of service of a State Highway roadway segment from acceptable operation to deficient operation with the addition of project-generated traffic.

A significant impact at a signalized intersection is said to be satisfactorily mitigated when measures are implemented that would adequately avoid or minimize an impact to a less-than-significant level.

Report Organization

The remainder of this report is divided into six chapters. Chapter 2 describes the existing roadway network, transit services, and pedestrian facilities. Chapter 3 describes the methods used to estimate project traffic, intersection operations under existing plus project conditions, and the project's impacts on the existing transportation system. Chapter 4 presents the intersection operations under cumulative conditions. Chapter 5 presents the project's impacts on transit, bicycle and pedestrian facilities, site access and on-site circulation, Front Street improvements, and parking. Chapter 6 discusses vehicle miles traveled (VMT). Chapter 7 includes a summary of project impacts and recommended improvements.

2. Existing Conditions

This chapter describes the existing conditions for transportation facilities in the vicinity of the site, including the roadway network, transit service, and pedestrian and bicycle facilities.

Roadway Network

Local roadways in the vicinity of the site include Front Street, Soquel Avenue, River Street, Cathcart Street, Laurel Street, Cooper Street, Water Street, Pacific Avenue, and Mission Street. These roadways are described below.

Front Street is a two- to four-lane arterial street that extends from Mission Street/Water Street in the north to Pacific Avenue to the south. Front Street is oriented in a north-south direction in the project vicinity. Front Street has bike lanes and continuous sidewalks present on both sides of the street. On-street parking is permitted on the east side of the street. The prima facie speed limit on Front Street is 25 mph.

Soquel Avenue is a two- to four-lane arterial street that extends from Pacific Avenue in the west to Gross Road from to the east. Soquel Avenue is oriented in a west-east direction in the project vicinity. Soquel Avenue has bike lanes and continuous sidewalks present on both sides of the street. On-street parking is prohibited along most of the roadway within the project vicinity. Soquel Avenue has a posted speed limit of 25 mph.

River Street is a two- to four-lane arterial street that extends from Highway 1 in the north to Soquel Avenue to the south. River Street is oriented in the north-south direction in the project vicinity. River Street has bike lanes/shared bike lanes and sidewalks on both sides of the street. On-street parking is permitted on the west side of the street. The posted speed limit on River Street is 25 mph.

Cathcart Street is a two-lane local street that extends from Cedar Street in the west to Front Street to the east. Cathcart Street is oriented in the west-east direction in the project vicinity. Cathcart Street has bike lanes and continuous sidewalks on both sides of the street. On-street parking is permitted on both sides of the street. The prima facie speed limit on Cathcart Street is 25 mph.

Laurel Street is a mostly two-lane arterial street that extends from Escalona Drive in the west to Broadway to the east. Laurel Street is oriented in the west-east direction in the project vicinity. Within the project vicinity, there are bike lanes from California Street to Broadway on both sides of the street. Laurel Street has sidewalks on both sides of the street from Highway 1 to Broadway. On-street parking is prohibited within the project vicinity, and the posted speed limit of 25 mph.

Cooper Street is a two-lane local street that extends from Pacific Avenue to Front Street. Cooper Street is oriented in the west-east direction. Within the project vicinity, Cooper Street has sidewalks on both sides of the street. On-street parking is permitted on both sides of the street. The prima facie speed limit is 25 mph.

Water Street is a four-lane arterial street that extends from Front Street/Pacific Avenue in the west to Soquel Avenue to the east. Water Street is oriented in the west-east direction in the project vicinity. Within the project vicinity, there are sidewalks and bike lanes on both sides of the street. On-street parking is permitted on both sides of the street. The posted speed limit on Water Street is 30 mph.

Pacific Avenue is a two-lane arterial street from Laurel Street to Cathcart Street. North of Cathcart Street, Pacific Street becomes a one-way street. Within the project vicinity, there are bike lanes throughout the segment and sidewalks on both sides of the street. On-street parking is permitted on both sides of the street. The posted speed limit is 15 mph within the project vicinity.

Mission Street is two- to four-lane arterial street that extends from Highway 1 to Pacific Avenue. Mission Street is oriented in the west-east direction in the project vicinity. There are bike lanes along Mission Street and sidewalks on both sides of the street. Some parking is provided on the street. The posted speed limit on Mission Street is 25 mph.

Pedestrian and Bicycle Facilities

Pedestrian facilities within the study area are in the form of sidewalks and crosswalks that are mostly signalized. Sidewalks are found on both sides of the streets in the study area. Crosswalks with pedestrian signal heads and push buttons are located at all the study intersections.

Bicycle facilities in the study area include a shared use path, bike lanes and a bike route (see Figure 3). Shared use paths are existing rights-of-way that accommodate bicycles and pedestrians and are separate from the existing travel lanes. The Santa Cruz Riverwalk (Class I Bikeway) runs along the San Lorenzo River from Beach Street to north of Highway 1. The Santa Cruz Riverwalk is located east of the project site. Bike lanes are lanes on roadways designated for use by bicycles with special lane markings, pavement legends, and signage. Bike routes are existing rights-of-way that accommodate bicycles but are not separate from the existing travel lanes. Routes are typically designated only with signs or pavement markers. Within the project study area, bike lanes (Class II Bikeway) are provided on study streets except Cooper Street. River Street South is a designated bike route (Class III Bikeway) marked with “sharrows.”

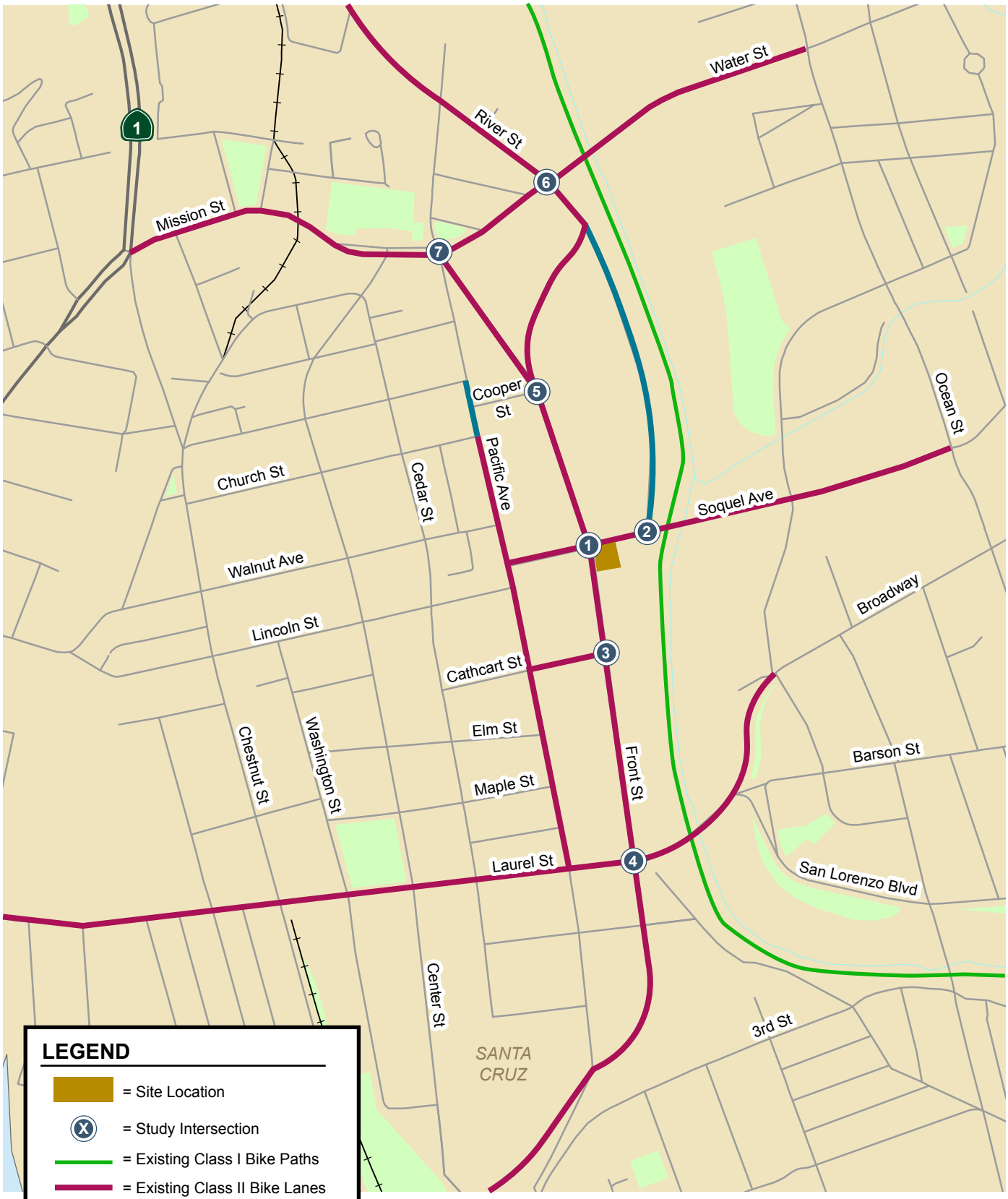


Figure 3
Existing Bicycle Facilities

Transit Services

Existing transit services near the project site are provided by the Santa Cruz Metro Transit District (See Figure 4). The transit service routes that run through the study area are listed in Table 2, including their route description, weekday hours of operation, and commute hour headways. The nearest stop is located adjacent to the project site on Soquel Avenue, providing access to Route 69A and 69W. Additional bus stops to the other bus routes are located at the Front Street/Soquel Avenue intersection, approximately 250 feet north of the site.

Table 2
Existing Transit Services

Bus Route	Route Description	Closest Stop & Distance to Project Site	Weekday Hours of Operation[1]	Headway[1]
Local Bus 4	Harvery West/Emeline	Front Street/Soquel Avenue, 0.01 mi	7:25 am - 5:45 pm	60 min
Local Bus 10	UCSC Via High; Adheres to UCSC & Weside School Term Calendar	Front Street/Soquel Avenue, 0.01 mi	7:20 am - 8:00 pm	30 min during school term calendar; 60 min
Local Bus 35/35A	San Lorenzo Valley (SLV) / SLV via Scotts Valley Drive	Front Street/Soquel Avenue, 0.01 mi	6:30 am - 11:55pm	30 min
Local Bus 66	Live Oak via 17th	Front Street/Soquel Avenue, 0.01 mi	5:55 am - 11:05 pm	60 min
Local Bus 69A	Capitola Rd. / Watsonville via Airport B	Front Street/Soquel Avenue, at project site	6:45 am - 7:15 pm	60 min
Local Bus 69W	Capitola Rd. / Cabrillo / Watsonville	Front Street/Soquel Avenue, at project site	6:20 am - 10:20 pm	60 min
Local Bus 71	Santa Cruz / Watsonville	Front Street/Soquel Avenue, 0.01 mi	5:30 am - 12:45 am	30 min

Notes:
1. Approximate weekday operation hours and headways during peak commute periods in the project area, as of May 2019.

Intersection Lane Configurations and Traffic Volumes

The existing lane configurations at the study intersections were obtained from field observations (see Figure 5).

Existing peak-hour traffic volumes were obtained from new turning-movement counts conducted in May 2019 (see Figure 6). New intersection turning-movement counts conducted for this analysis are presented in Appendix A.

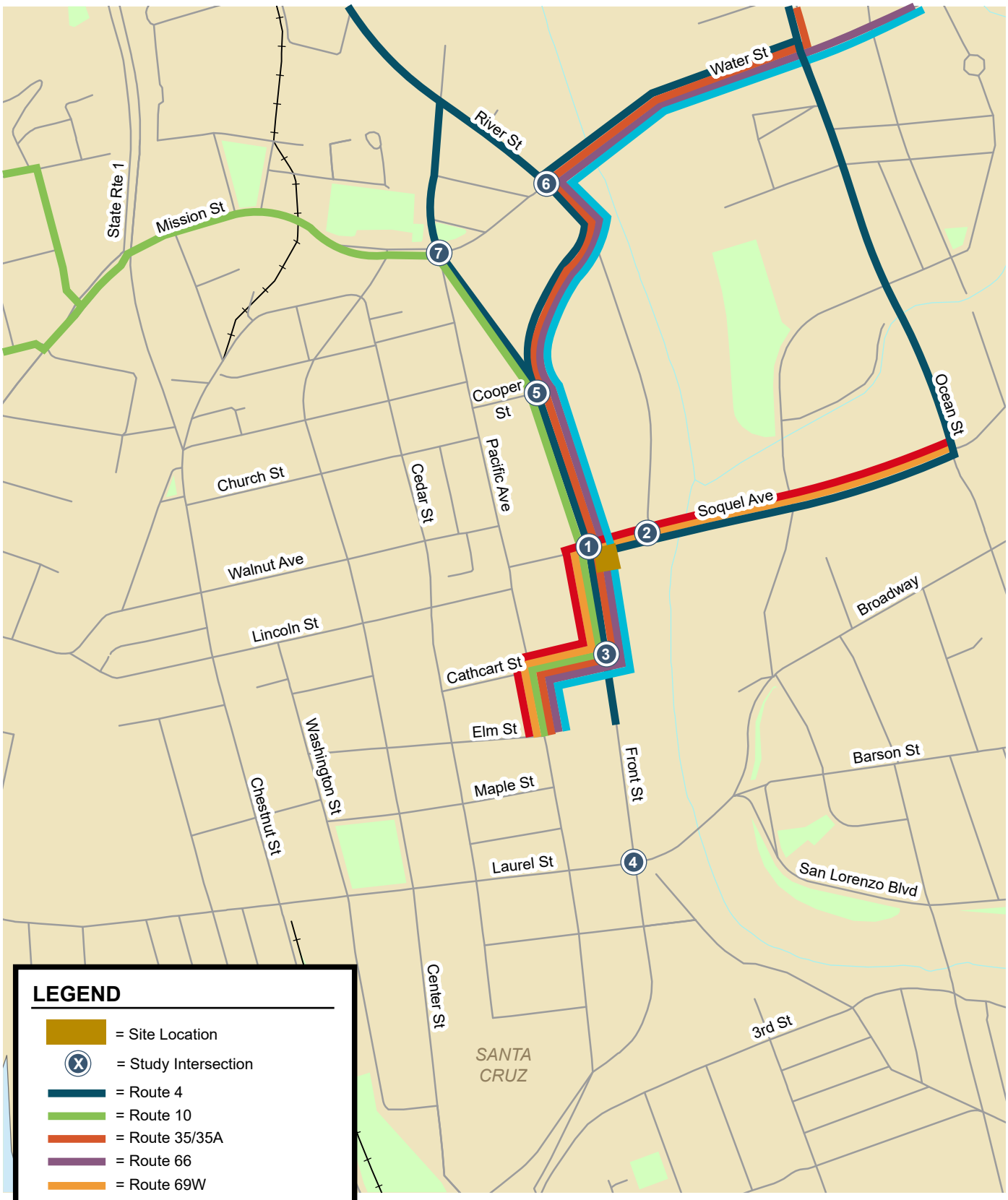


Figure 4
Existing Transit Services

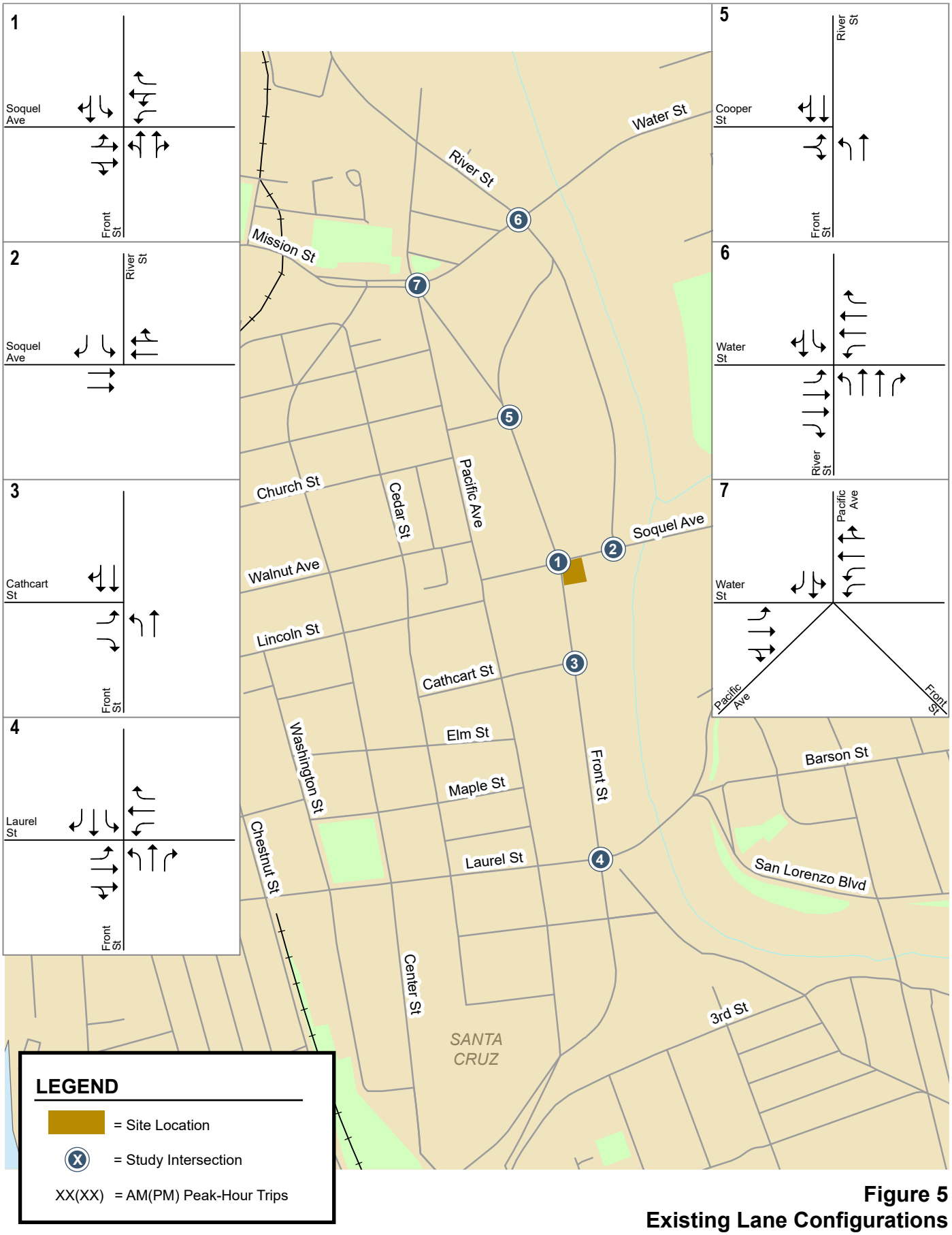


Figure 5
Existing Lane Configurations

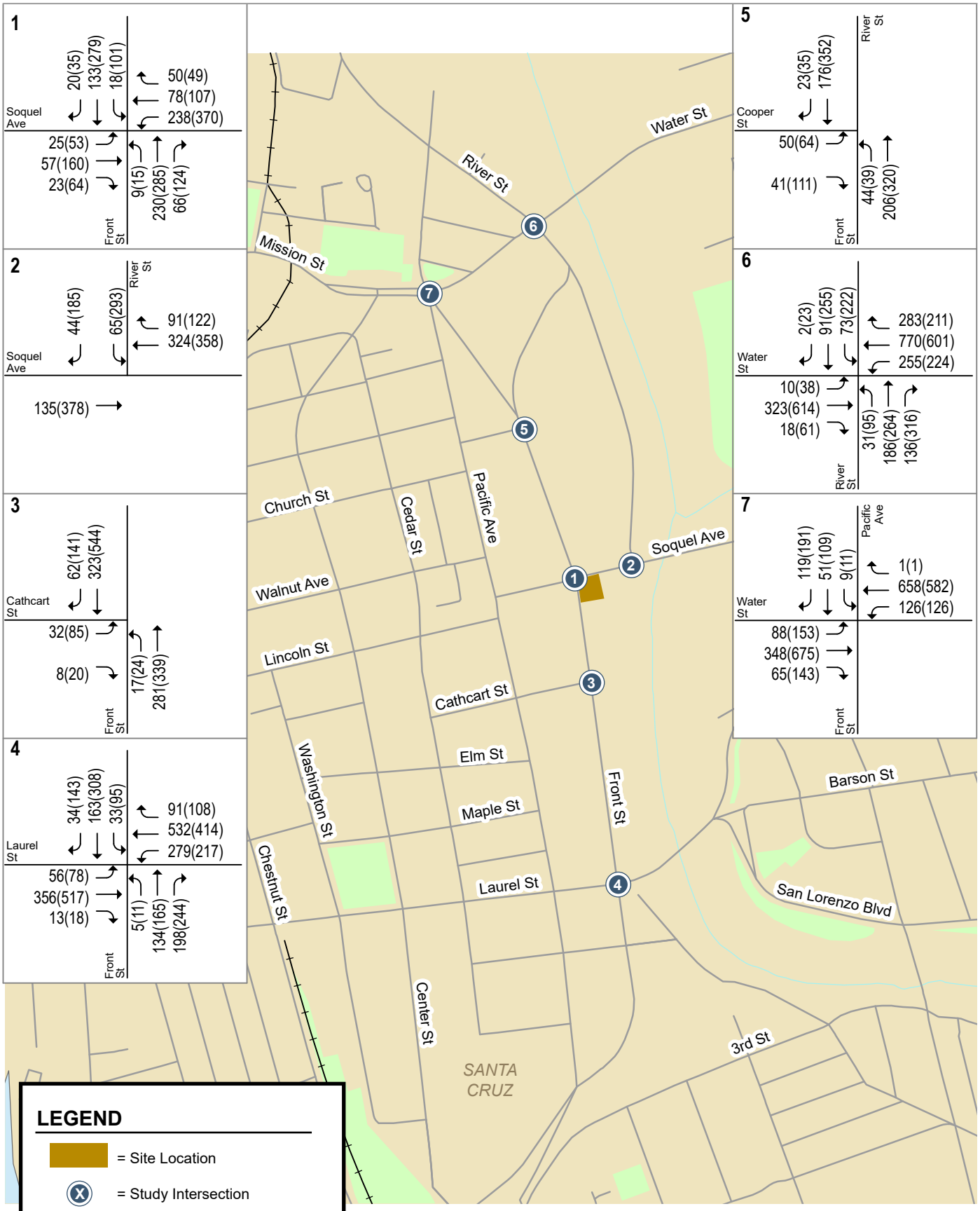


Figure 6
Existing Traffic Volumes

Existing Intersection Levels of Service

The intersection level of service analysis results show that all study intersections currently operate at acceptable levels of service during both AM and PM peak hours under existing conditions (see Table 3). The intersection level of service calculation sheets are included in Appendix B.

Table 3
Existing Intersection Levels of Service

#	Intersection	Control	Peak Hour	Count Date	Note	Existing Avg. Delay (sec)	Existing LOS
1	Front Street & Soquel Avenue	Signal	AM	05/14/19		31.6	C
			PM	05/14/19		31.3	C
2	River Street & Soquel Avenue	Signal	AM	05/14/19		10.4	B
			PM	05/14/19		9.8	A
3	Front Street & Cathcart Street	Signal	AM	05/14/19	*	15.0	B
			PM	05/14/19	*	17.5	B
4	Front Street & Laurel Street	Signal	AM	05/14/19		23.3	C
			PM	05/14/19		26.0	C
5	Front Street & Cooper Street	Signal	AM	05/14/19		5.4	A
			PM	05/14/19		6.2	A
6	River Street & Water Street	Signal	AM	05/14/19		22.2	C
			PM	05/14/19		29.6	C
7	Pacific Avenue/Front Street & Mission Street/Water Street	Signal	AM	05/14/19	*	19.5	B
			PM	05/14/19	*	20.6	C

Notes:
* indicates the intersection level of service is calculated using the HCM 2000 module with the Synchro software. These intersections have unusual lane geometries that cannot be supported by the Synchro HCM 6th Edition module.

Observed Traffic Conditions

Traffic conditions were observed in the field in order to identify existing operational deficiencies and to confirm the accuracy of calculated levels of service. The purpose of this effort was (1) to identify any existing traffic problems that may not be directly related to intersection level of service, and (2) to identify any locations where the level of service analysis does not accurately reflect level of service in the field.

Overall, the study intersections operated adequately during both the AM and PM peak hours of traffic, and the level of service analysis appears to accurately reflect actual existing traffic conditions. Field observations showed no operational issues occurred at any of the study intersections.

3.
Existing Plus Project Conditions

This chapter describes existing traffic conditions with the addition of the traffic that would be generated by the proposed project.

Roadway Network

The roadway network under existing plus project conditions would be the same as the existing roadway network because the project would not alter the existing intersection lane configurations.

Project Trip Estimates

The magnitude of traffic produced by a new development and the locations where that traffic would appear are estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. In determining project trip generation, the magnitude of traffic entering and exiting the site is estimated for the AM and PM peak hours. As part of the project trip distribution, an estimate is made of the directions to and from which the project trips would travel. In the project trip assignment, the project trips are assigned to specific streets and intersections. These procedures are described below.

Trip Generation

Through empirical research, data have been collected that quantify the amount of traffic produced by many types of land uses. The research is compiled in the Institute of Transportation Engineers' (ITE) manual entitled *Trip Generation, 10th Edition* (2017). The rates published for Multifamily Housing – Mid-Rise (Land Use 221), Office Building (Land Use 710), Shopping Center (Land Use 820), and Quality Restaurant (Land Use 931) were used to estimate the trips generated by the proposed mixed-use project. The rate for the café was based on previous café applications in the City of Santa Cruz. Based on these rates, the proposed project would generate 1,907 daily trips with 112 trips during the AM peak hour and 159 trips during the PM peak hour (see Table 4).

Trip Adjustments and Reductions

The existing office, restaurant, and retail uses can be credited against the proposed mixed-use development. The existing buildings' trip generation are based on the average rates published by ITE. Based on the ITE rates, it is estimated that the existing buildings would generate 888 daily trips with 10 trips during the AM peak hour and 85 trips during the PM peak hour.

The City of Santa Cruz allows a 40 percent trip reduction for mixed-use developments in Downtown Santa Cruz to account for internal capture, walkability, bike-ability, and the existing Metro Transit

Center as part of the City of Santa Cruz *Downtown Plan Amendment (DPA), July 2017*. The Santa Cruz Metro Center is located approximately 800 feet south of the project site along Front Street. The Metro Center provides transit service throughout Santa Cruz County via the Santa Cruz Metro Transit District. Bike lanes and sidewalks are located along Front Street. Thus, a 40 percent reduction was applied to the proposed trip generation estimates.

After accounting for the trips generated by the existing businesses and appropriate trip reductions, the proposed mixed-use project is estimated to generate 611 new daily trips with a net increase of 61 trips in the AM peak hour and a net increase of 45 trips in the PM peak hour.

Table 4
Project Trip Generation Estimates

Land Use	Size		Daily		AM Peak Hour				PM Peak Hour			
			Rate	Trips	Rate	In	Out	Total	Rate	In	Out	Total
Proposed Uses												
Retail[1]	4.6	ksf	37.75	173	0.94	2	2	4	3.81	8	9	17
Café[5]	0.7	ksf	60.00	41	13.17	5	4	9	4.73	2	1	3
Restaurant[2]	2.3	ksf	83.84	192	-	0	0	0	7.80	12	6	18
Multifamily Housing (Mid-Rise)[3]	276.0	DU	5.44	1,501	0.36	26	73	99	0.44	74	47	121
Subtotal				**1,907**		**33**	**79**	**112**		**96**	**63**	**159**
- 40% Reduction for Downtown Area[6]				(763)		(13)	(32)	(45)		(38)	(25)	(63)
Net Proposed Uses				**1,144**		**20**	**47**	**67**		**58**	**38**	**96**
Existing Uses												
Office[4]	6.4	ksf	9.74	63	1.16	6	1	7	1.15	1	7	8
Restaurants[2]	8.5	ksf	83.84	712	-	0	0	0	7.80	44	22	66
Retail[1]	3.0	ksf	37.75	113	0.94	2	1	3	3.81	5	6	11
Subtotal				**888**		**8**	**2**	**10**		**50**	**35**	**85**
- 40% Reduction for Downtown Area[6]				(355)		(3)	(1)	(4)		(20)	(14)	(34)
Net Existing Uses				**533**		**5**	**1**	**6**		**30**	**21**	**51**
Net Project Trips				**611**		**15**	**46**	**61**		**28**	**17**	**45**

Note:
Trip rates for shopping center, restaurant, office, and multifamily housing are from the ITE Trip Generation Manual, 10th Edition, 2017.
1. Shopping Center (Land Use 820) average rates expressed in trips per 1,000 square feet (ksf) are used.
2. Quality Restaurant (Land Use 931) average rates expressed in trips per 1,000 square feet (ksf) are used. It is assumed that the restaurants do not operate during the AM peak hour. Therefore, no trips were added.
3. Multifamily Housing (Mid-Rise) (Land Use 221) average rates expressed in trips per dwelling units (DU) are used.
4. Office Building (Land Use 710) average rates expressed in trips per 1,000 square feet (ksf) are used.
5. Previous City of Santa Cruz Café average rates expressed in trips per 1,000 square feet (KSF) are used to estimate the PM Peak Hour. The proportion ratio of AM and PM Peak Hour rates for Coffee/Donut Shop without Drive-Through Window (Land Use 936) were used to proportionally estimate the AM Peak Hour for the proposed Café. Daily traffic rate estimated based on peak hours.
6. 40% reduction for mixed-use development in Downtown Santa Cruz per Santa Cruz Downtown Recovery Plan Amendment, May 2017.

Trip Distribution and Assignment

The trip distribution pattern for the proposed development was estimated based on existing travel patterns on the surrounding roadway system and the locations of complementary land uses (see Figure 7).

The peak-hour trips generated by the existing and proposed uses were assigned to the roadway system based on the directions of approach and departure, the roadway network connections, and the locations of project driveways (see Figure 8). The trips generated by the existing uses were subtracted from the roadway network prior to assigning project trips. It is assumed that all residential trips would enter and exit the project site via a driveway on Front Street.

Intersection Traffic Volumes

Project trips, as represented in the above project trip assignment, were added to existing traffic volumes to obtain existing plus project traffic volumes (see Figure 9).

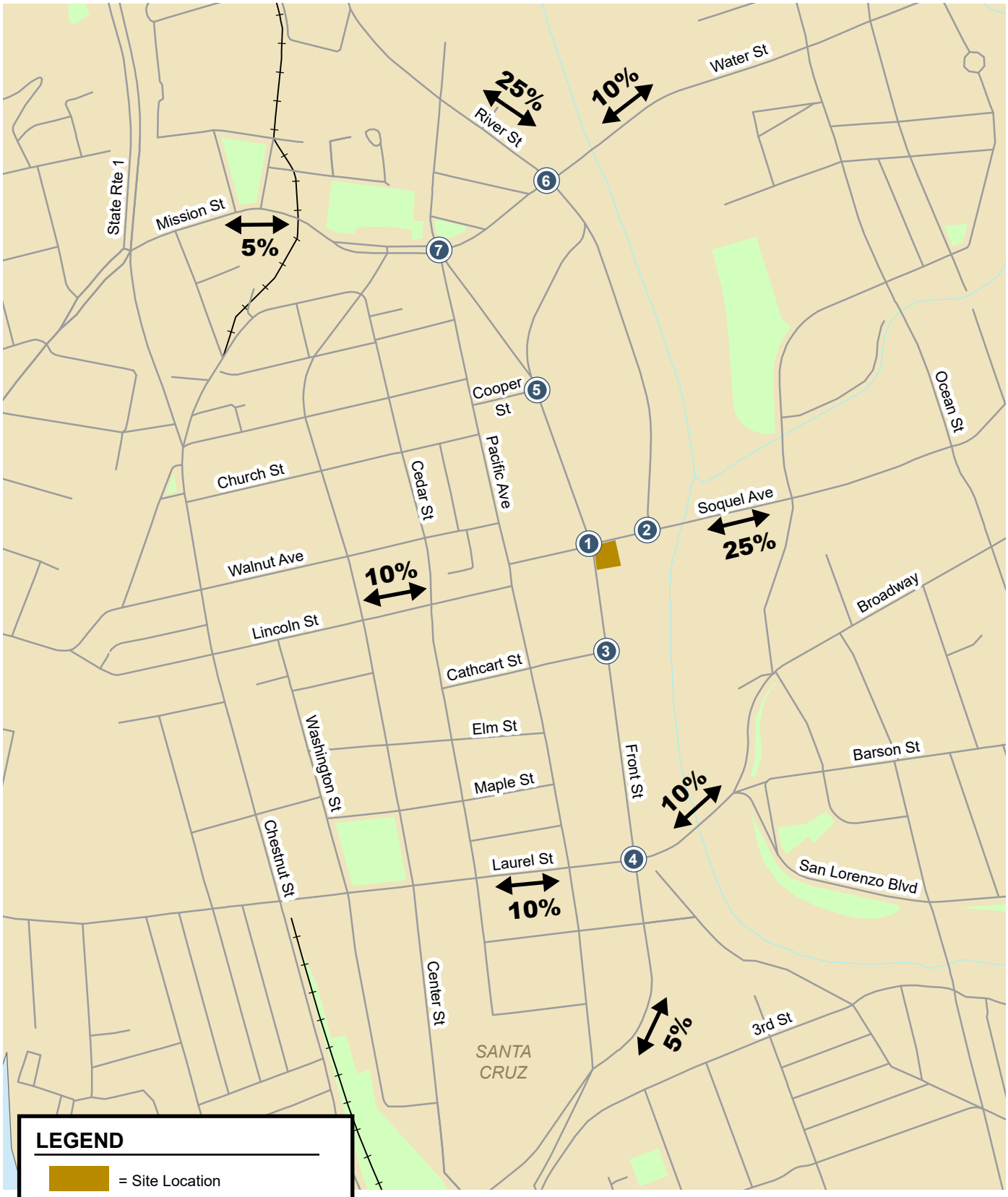


Figure 7
Project Trip Distribution Pattern

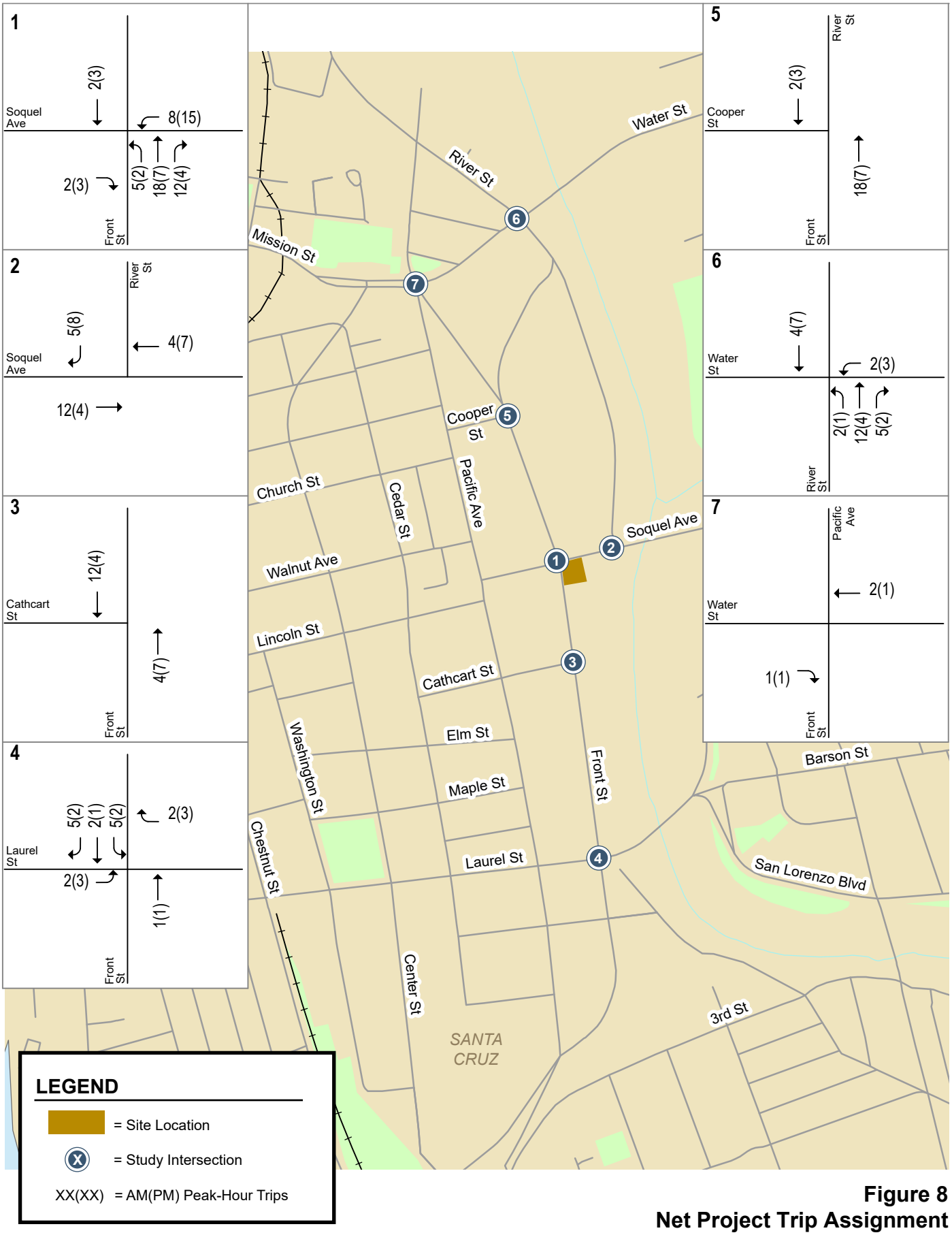


Figure 8
Net Project Trip Assignment

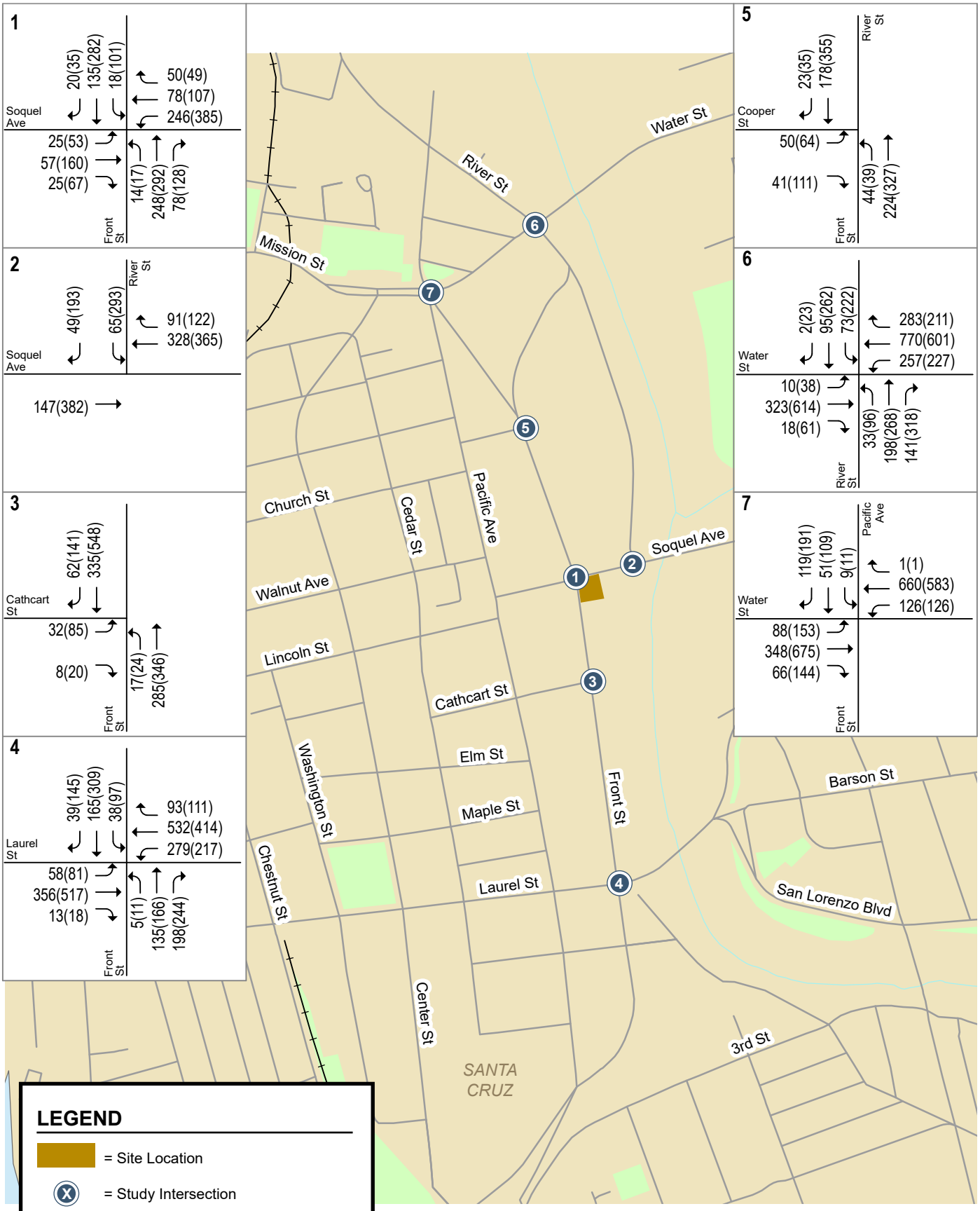


Figure 9
Existing Plus Project Traffic Volumes

Existing Plus Project Intersection Levels of Service

The intersection level of service analysis results show that all study intersections would operate at acceptable levels of service during both AM and PM peak hours under existing plus project conditions (see Table 5). It should be noted that, at some study intersections, the average delay under project conditions is shown to be better than under no-project conditions. This occurs because the project would result in a reduction in traffic for several of the intersection movements. The intersection level of service calculation sheets are included in Appendix B.

Table 5
Existing Plus Project Intersection Levels of Service

						Existing		Existing plus Project		
#	Intersection	Control	Peak Hour	Count Date	Note	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Incr. in Avg. Delay
1	Front Street & Soquel Avenue	Signal	AM	05/14/19		31.6	C	31.8	C	0.2
			PM	05/14/19		31.3	C	31.3	C	0.0
2	River Street & Soquel Avenue	Signal	AM	05/14/19		10.4	B	10.4	B	0.0
			PM	05/14/19		9.8	A	9.8	A	0.0
3	Front Street & Cathcart Street	Signal	AM	05/14/19	*	15.0	B	15.1	B	0.1
			PM	05/14/19	*	17.5	B	17.5	B	0.0
4	Front Street & Laurel Street	Signal	AM	05/14/19		23.3	C	23.6	C	0.3
			PM	05/14/19		26.0	C	27.4	C	1.4
5	Front Street & Cooper Street	Signal	AM	05/14/19		5.4	A	5.3	A	-0.1
			PM	05/14/19		6.2	A	6.1	A	-0.1
6	River Street & Water Street	Signal	AM	05/14/19		22.2	C	22.2	C	0.0
			PM	05/14/19		29.6	C	29.8	C	0.2
7	Pacific Avenue/Front Street & Mission Street/Water Street	Signal	AM	05/14/19	*	19.5	B	19.5	B	0.0
			PM	05/14/19	*	20.6	C	20.6	C	0.0

Notes:
* indicates the intersection level of service is calculated using the HCM 2000 module with the Synchro software. These intersections have unusual lane geometries that cannot be supported by the Synchro HCM 6th Edition module.

4. Cumulative Conditions

This chapter presents a summary of the traffic conditions that would occur under cumulative conditions. Peak hour traffic volumes for Cumulative conditions were obtained from the City of Santa Cruz 2030 General Plan (PM peak hour only).

Roadway Network Under Cumulative Conditions

The City has no plans to change the roadway network in the vicinity of the project site.

Cumulative Traffic Volumes

Traffic volumes under cumulative conditions were based on the total trips generated by buildout of the General Plan and the 508 Front Street traffic study. The project is not included in the General Plan buildout. Therefore, to estimate the cumulative plus project volumes, the project trips were added to the General Plan buildout. The following study intersections used the cumulative plus project volumes from the 508 Front Street traffic study:

- Front Street & Soquel Avenue
- Front Street & Cathcart Street
- Front Street & Laurel Street

Figure 10 and Figure 11 shows the cumulative traffic volumes and cumulative with project traffic volumes, respectively.

Volumes under cumulative conditions are presented in Appendix C.

Cumulative Intersection Levels of Service

The results of the level of service analysis under cumulative conditions show that the following intersections would operate under unacceptable level of service conditions during the PM peak hour, both with and without the project (see Table 6):

- Front Street & Soquel Avenue
- Front Street & Laurel Street

The project would add traffic to these deficient intersections, which constitutes an impact according to Santa Cruz standards.

The detailed level of service calculation sheets are included in Appendix B.

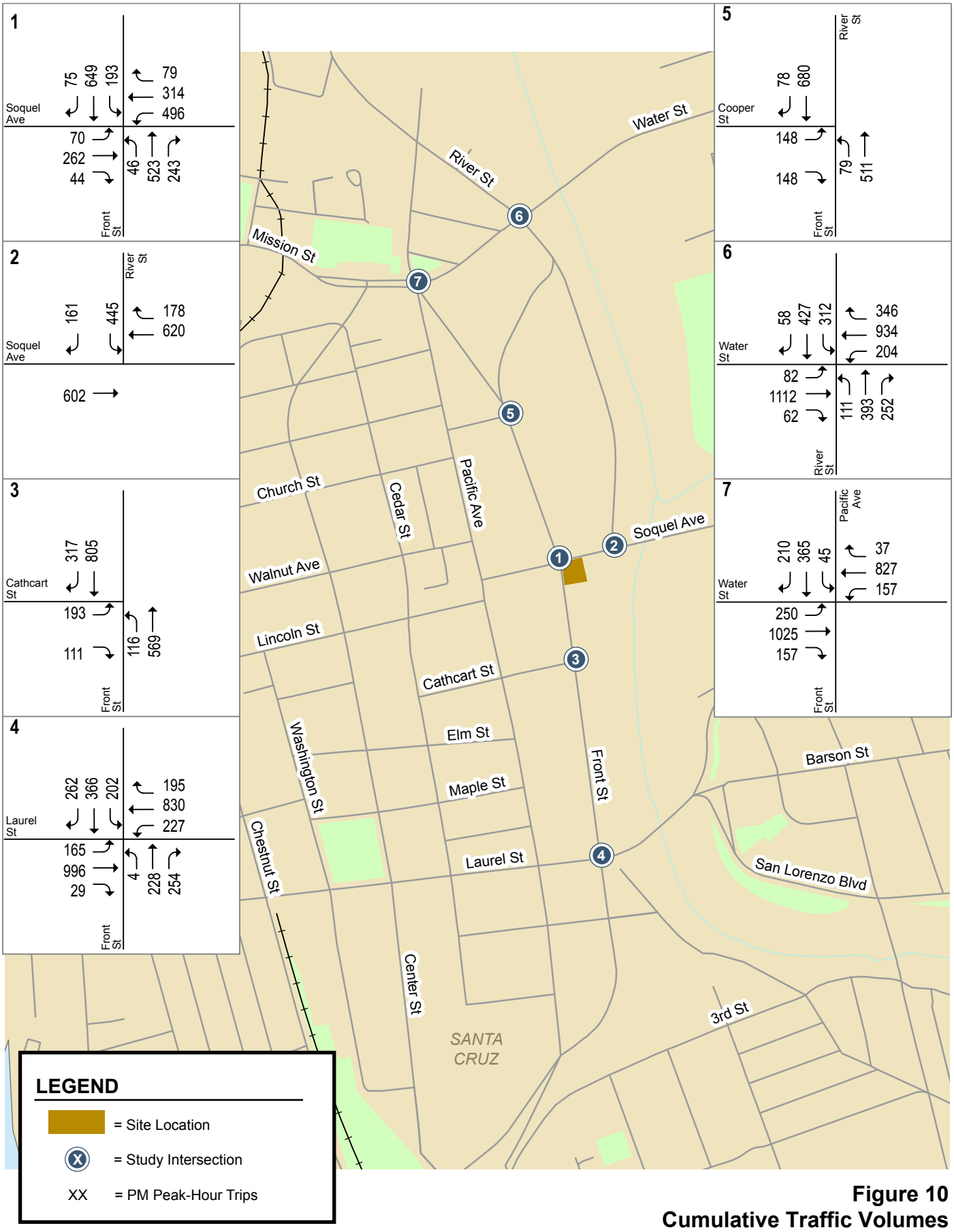


Figure 10
Cumulative Traffic Volumes

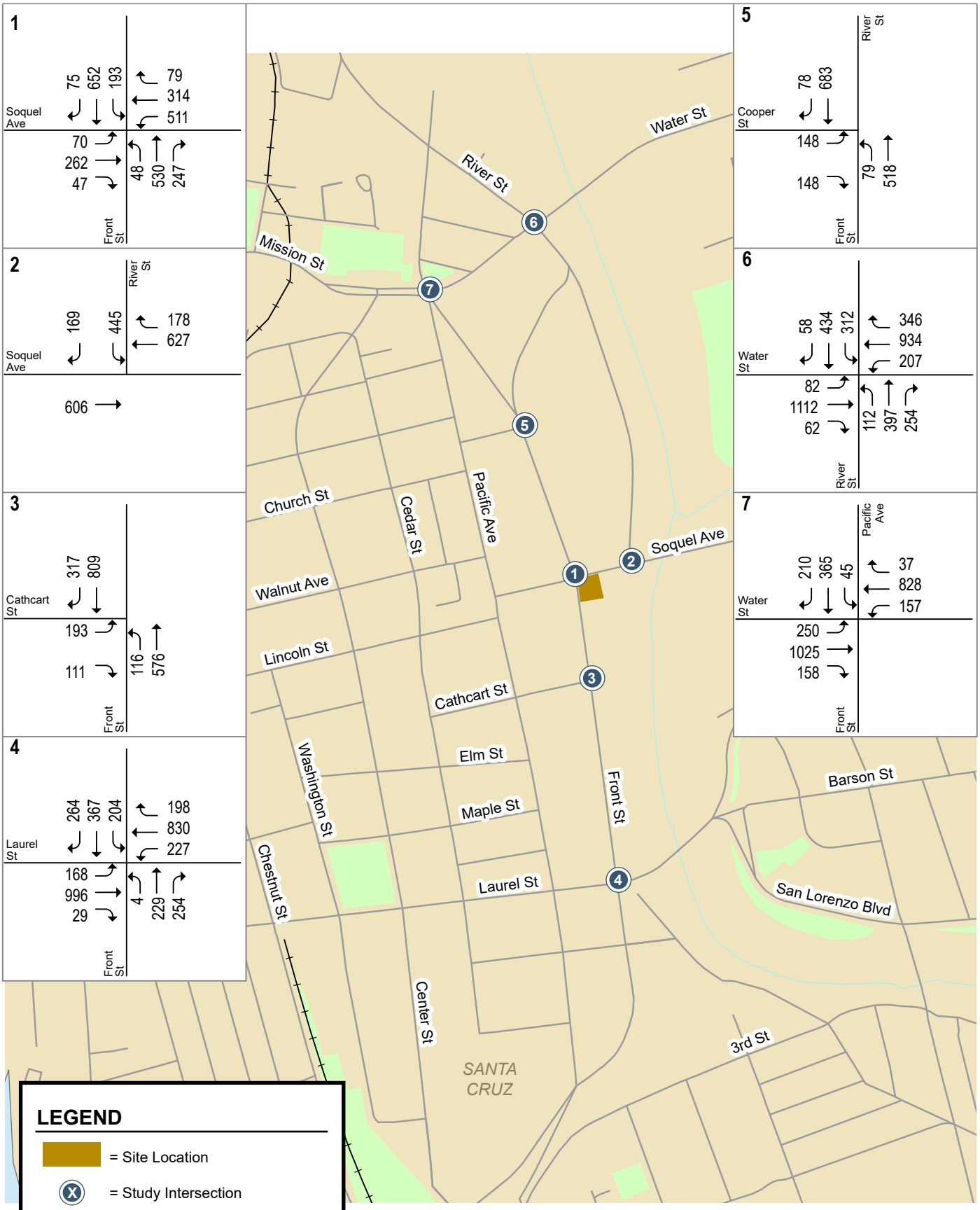


Figure 11
Cumulative Plus Project Traffic Volumes

Table 6
Cumulative Intersection Levels of Service

#	Intersection	Control	Peak Hour	Note	Year 2030 no Project Conditions Avg. Delay (sec)	Year 2030 no Project Conditions LOS	Year 2030 Plus Project Conditions Avg. Delay (sec)	Year 2030 Plus Project Conditions LOS
1	Front Street & Soquel Avenue[4]	Signal	AM		-	-	-	-
			PM		**66.7**	**E**	**75.3**	**E**
2	River Street & Soquel Avenue[1 2 3]	Signal	AM		-	-	-	-
			PM		11.6	B	11.7	B
3	Front Street & Cathcart Street[4]	Signal	AM	*	-	-	-	-
			PM	*	29.0	C	29.0	C
4	Front Street & Laurel Street[4]	Signal	AM		-	-	-	-
			PM		**67.9**	**E**	**69.6**	**E**
5	Front Street & Cooper Street[1 2 3]	Signal	AM		-	-	-	-
			PM		8.8	A	8.8	A
6	River Street & Water Street[1 2 3]	Signal	AM		-	-	-	-
			PM		53.1	D	53.8	D
7	Pacific Avenue/Front Street & Mission Street/Water Street[1 2 3]	Signal	AM	*	-	-	-	-
			PM	*	32.0	C	32.0	C

Notes:
* indicates the intersection level of service is calculated using the HCM 2000 module with the Synchro software. These intersections have unusual lane geometries that cannot be supported by the Synchro HCM 6th Edition module.
BOLD indicates a substandard level of service.
1. Year 2030 conditions intersection level of service results are based on results published in the City of Santa Cruz Critical Intersections and General Plan Buildout Traffic Volumes - Transportation Impact Study Guidelines. Project-generated traffic volumes were applied to the Year 2030 GP conditions LOS results to derive the Year 2030 no project conditions LOS results.
2. Year 2030 intersection level of service results for these intersections were not reported in the Critical Intersections and General Plan Buildout document. Volumes at these intersections were used to analyze resulting Year 2030 LOS results using
3. 2030 General Plan volumes were supplied only for the PM peak hour.
4. Year 2030 conditions intersection level of service results are based on cumulative plus project volumes from the 508 Front Street traffic study.

Mitigation Measures

The Downtown Plan Amendments EIR has identified several roadway improvements for which the costs would be covered by anticipated future development projects. Estimated engineering costs for these improvements were estimated, and the 530 Front Street's fair share payment was calculated based on its cumulative impacts caused at the study intersections.

The project's fair share is estimated to be 13.31%. This is based on the 45 PM peak hour project trips divided by the Downtown Plan Amendments' 293 PM peak hour net new trips plus the project's PM peak hour net new trips (45/338 = 13.31%).

The recommended mitigation measures under cumulative conditions are described below. The mitigated cumulative plus project level of service analysis is shown in Table 7.

Table 7
Mitigated Cumulative Intersection Levels of Service

#	Intersection	Control	Peak Hour	Note	Year 2030 no Project Conditions Avg. Delay (sec)	Year 2030 no Project Conditions LOS	Year 2030 Plus Project Conditions Avg. Delay (sec)	Year 2030 Plus Project Conditions LOS	Mitigated Year 2030 Plus Project Avg. Delay (sec)	Mitigated Year 2030 Plus Project LOS
1	Front Street & Soquel Avenue[4]	Signal	AM		-	-	-	-	-	-
			PM		**66.7**	**E**	**75.3**	**E**	54.5	D
2	River Street & Soquel Avenue[1 2 3]	Signal	AM		-	-	-	-	-	-
			PM		11.6	B	11.7	B	-	-
3	Front Street & Cathcart Street[4]	Signal	AM	*	-	-	-	-	-	-
			PM	*	29.0	C	29.0	C	-	-
4	Front Street & Laurel Street[4]	Signal	AM		-	-	-	-	-	-
			PM		**67.9**	**E**	**69.6**	**E**	54.4	D
5	Front Street & Cooper Street[1 2 3]	Signal	AM		-	-	-	-	-	-
			PM		8.8	A	8.8	A	-	-
6	River Street & Water Street[1 2 3]	Signal	AM		-	-	-	-	-	-
			PM		53.1	D	53.8	D	-	-
7	Pacific Avenue/Front Street & Mission Street/Water Street[1 2 3]	Signal	AM	*	-	-	-	-	-	-
			PM	*	32.0	C	32.0	C	-	-

Notes:
* indicates the intersection level of service is calculated using the HCM 2000 module with the Synchro software. These intersections have unusual lane geometries that cannot be supported by the Synchro HCM 6th Edition module.
BOLD indicates a substandard level of service.
1. Year 2030 conditions intersection level of service results are based on results published in the City of Santa Cruz Critical Intersections and General Plan Buildout Traffic Volumes - Transportation Impact Study Guidelines. Project-generated traffic volumes were applied to the Year 2030 GP conditions LOS results to derive the Year 2030 no project conditions LOS results.
2. Year 2030 intersection level of service results for these intersections were not reported in the Critical Intersections and General Plan Buildout document. Volumes at these intersections were used to analyze resulting Year 2030 LOS results using Synchro.
3. 2030 General Plan volumes were supplied only for the PM peak hour.
4. Year 2030 conditions intersection level of service results are based on cumulative plus project volumes from the 508 Front Street traffic study.

Front Street and Soquel Avenue

Mitigation: The significant cumulative impact at this intersection could be mitigated by adding a second westbound left-turn lane. The centerline median would be shifted south, and the east leg would be reduced to one through lane between Front Street and River Street. The westbound shared through-left lane would be converted into a through-lane. The signal timing and phasing would be optimized.

The cost for the construction of this improvement is estimated to be $599,000 based on the 508 Front Street TIA study. With this improvement, the intersection would operate at an acceptable LOS D during the PM peak hour.

Front Street and Laurel Street

Mitigation: The significant cumulative impact at this intersection could be mitigated by converting the westbound right-turn lane into a shared through-right lane. The west leg would be widened to provide a receiving lane between Pacific Avenue and Front Street, relocating sidewalk, utilities, and landscaping. A right-turn overlap phase would be provided for the northbound and southbound approaches.

The cost for the construction of this improvement is estimated to be $599,000 based on the 508 Front Street TIA study. With this improvement, the intersection would operate at an acceptable LOS D during the PM peak hour.

Pacific Avenue and Laurel Street

Impact: Although this intersection was not included in this study, the addition of project traffic to this intersection would continue to operate at LOS E during Cumulative Plus Project conditions based on the 508 Front Street TIA study. This constitutes a significant impact according to the thresholds established by the City of Santa Cruz.

Mitigation: The significant cumulative impact at this intersection could be mitigated by the construction of a southbound left-turn lane and removing the existing landscape median.

The estimated engineering cost for the construction of this improvement is estimated to be approximately $313,000 based on the 508 Front Street TIA study. With this improvement, the intersection would operate at an acceptable LOS D during the PM peak hour.

Front Street Improvements

Under the direction of the City of Santa Cruz, a continuous two-way left-turn lane (TWLTL) along Front Street would be implemented that could be used by inbound and outbound traffic from all driveways. The TWLTL would extend from Soquel Avenue to Laurel Street. With the implementation of this continuous two-way left-turn lane, on-street parking on both sides of the street would be eliminated. Continuous Class bike lanes and Class II buffered bike lanes would be provided with the restriping of Front Street.

The cost to construct these improvements is estimated to be $169,000 based on the 508 Front Street TIA study.

5.
Other Transportation Issues

This chapter presents other transportation issues associated with the project. These include an analysis of:

- Potential impacts to pedestrians, bicycles, and transit services
- Site access and on-site circulation
- Front Street Improvements
- Queuing Analysis
- Parking

These other transportation issues were evaluated to determine if any deficiencies would exist under project conditions that may not be specifically linked to environmental impact reporting. These may not be considered environmental issues, and may not be evaluated in an environmental assessment, but have been included in the traffic study to meet the requirements of the local jurisdiction. Unlike the level of service impact methodology, the analyses in this chapter are based on professional judgment in accordance with the standards and methods employed by the traffic engineering community.

Potential Impacts on Pedestrians, Bicycles, and Transit

The existing network of sidewalks and crosswalks in the immediate vicinity of the project site provides good connectivity and provides pedestrians with safe routes to various points of interest in the study area, including nearby bus stops on Front Street and Soquel Avenue. In the project vicinity, sidewalks are provided along the project's frontage on Front Street and Soquel Avenue. The project would remove one existing driveway along Soquel Avenue and widen the sidewalk. Therefore, the project would have a beneficial impact on pedestrian circulation.

The site has very good bicycle access. As described in Chapter 2, bike lanes are provided along all the study streets except Cooper Street and River Street South. River Street South provides a bike route from River Street to Soquel Avenue. The Santa Cruz Riverwalk provides access along the San Lorenzo River for both bicyclists and pedestrians. It is expected that any construction of storm water structures near the shared use path could impact bicycle mobility along the path. A path turnout is required for maintenance of the stormwater structure. Based on the site plan, the project would provide bicycle parking within the garage.

The project site is currently well-served by bus transit. There are seven local bus lines (Route 4, 10, 35/35A, 66, 69A, 69W, and 71) that serve the immediate project area. The bus stops closest to the project site are on Front Street at Soquel Avenue. The bus routes run throughout the day with 30-60 minute headways. The bus services have ample capacity to accommodate the ridership that would be generated by the project.

Queuing Analysis

The analysis of intersection levels of service was supplemented with a vehicle queuing analysis for left-turn lanes at intersections where the project would add left-turn movements (See Table 8). This analysis provides a basis for estimating future storage requirements at the intersections under existing plus project conditions. Vehicle queues were estimated using a Poisson probability distribution, described in Chapter 1. The following movements were selected for evaluation:

- Front Street and Soquel Avenue – Northbound left turn and Westbound left turn
- Front Street and Laurel Street – Southbound left turn and Eastbound left turn
- River Street and Water Street – Northbound left turn and Westbound left turn
- Front Street and Project Driveway – Southbound left turn/through and Westbound left turn

Front Street and Soquel Avenue

The estimated 95th percentile queues at the westbound left-turn lane of this intersection exceeds the vehicle storage capacity during the PM peak hour under all cumulative conditions. The existing left-turn lane provides 200 feet of queue storage per lane and would require 275 feet based on the queuing analysis during the PM peak hour under cumulative plus project conditions. The project would increase the 95th percentile queue for the westbound left-turn lane by 25 feet or 1 vehicle. There is no room to extend the left-turn pocket due to the maximum queue storage reaching to the River Street and Soquel Avenue intersection.

Front Street and Laurel Street

The estimated 95th percentile queues at the southbound left-turn lane of this intersection exceeds the vehicle storage capacity during the PM peak hour under all cumulative conditions. The existing left-turn lane provides 150 feet of queue storage and would require 225 feet based on the queuing analysis during the PM peak hour under cumulative plus project conditions. The project would not increase the 95th percentile queue for the southbound left-turn lane. The Front Street improvements propose to add a two-way left-turn center lane. The center lane could provide additional room for the left-turn pocket.

The estimated 95th percentile queues at the eastbound left-turn lane of this intersection exceeds the vehicle storage capacity during the PM peak hour under all cumulative conditions. The existing left-turn lane provides 100 feet of queue storage and would require 200 feet based on the queuing analysis during the PM peak hour under cumulative conditions. The project would not increase the 95th percentile queue for the eastbound left-turn lane. There is no room in the median to lengthen the left-turn pocket.

River Street and Water Street

The estimated 95th percentile queues at the northbound left-turn lane of this intersection currently exceeds the vehicle storage capacity during the PM peak hour and would continue to do so under cumulative conditions. The existing left-turn lane provides 100 feet of queue storage and would require 150 feet based on the queuing analysis during the PM peak hour under cumulative plus project conditions. The project would not increase the 95th percentile queue for the northbound left-turn lane. There is no room in the median to lengthen the left-turn pocket.

Table 8
Queuing Analysis

Measurement	Front Street and Soquel Avenue				Front Street and Laurel Street				River Street and Water Street				Front Street and Project Driveway[3]			
	NBL		WBL		SBL		EBL		NBL		WBL		SBTH/SBL		WBL	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Existing																
Cycle/Delay [1] (sec)	88	88	88	88	88	88	88	88	93	93	93	93	7.9	8.2	10.8	12.1
Volume (vphpl)	9	15	119	185	33	95	56	78	31	95	255	224	394	713	0	0
Total 95th %. Queue (veh.)	1	2	6	8	2	5	4	4	2	5	11	10	3	4	0	0
Total 95th %. Queue (ft.) [2]	25	50	150	200	50	125	100	100	50	125	275	250	75	100	0	0
Total Storage	400	400	200	200	150	150	100	100	100	100	375	375	300	300	50	50
Adequate (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	**N**	Y	Y	Y	Y	Y	Y
Existing Plus Project																
Cycle/Delay [1] (sec)	88	88	88	88	88	88	88	88	93	93	93	93	7.9	8.2	10.8	12.1
Volume (vphpl)	14	17	123	192	38	97	58	81	33	96	257	227	405	734	12	4
Total 95th %. Queue (veh.)	1	2	6	8	3	5	4	5	3	5	11	10	3	4	1	1
Total 95th %. Queue (ft.) [2]	25	50	150	200	75	125	100	125	75	125	275	250	75	100	25	25
Total Storage	400	400	200	200	150	150	100	100	100	100	375	375	300	300	50	50
Adequate (Y/N)	Y	Y	Y	Y	Y	Y	Y	**N**	Y	**N**	Y	Y	Y	Y	Y	Y
Cumulative																
Cycle/Delay [1] (sec)		88		88		88		88		93		93		8.2		12.1
Volume (vphpl)		46		248		202		165		111		204		1189		0
95th %. Queue (veh/ln.)		3		10		9		8		6		9		6		0
95th %. Queue (ft./ln)		75		250		225		200		150		225		150		0
Storage (ft./ ln.)		400		200		150		100		100		375		300		50
Adequate (Y/N)		Y		**N**		**N**		**N**		**N**		Y		Y		Y
Cumulative Plus Project																
Cycle/Delay [1] (sec)		88		88		88		88		93		93		8.2		12.1
Volume (vphpl)		48		255		204		168		112		207		1210		4
95th %. Queue (veh/ln.)		3		11		9		8		6		9		6		1
95th %. Queue (ft./ln)		75		275		225		200		150		225		150		25
Storage (ft./ ln.)		400		200		150		100		100		375		300		50
Adequate (Y/N)		Y		**N**		**N**		**N**		**N**		Y		Y		Y

Notes:
WBL = westbound left movement; NBL = northbound left movement; SBL = southbound left movement; EBL = eastbound left movement; SBTH = southbound through movement

[1] Vehicle queue calculations based on cycle length for signalized intersections and worst approach delay for unsignalized intersections.

[2] Assumes 25 Feet Per Vehicle Queued.

[3] The southbound left-turn/through storage length reflects the distance between the project drivway and Front Street.

Site Access and On-Site Circulation

A review of the project site plan was performed to determine whether adequate site access and onsite circulation would be provided, using commonly accepted transportation planning principles and traffic engineering standards. This review was based on the site plan prepared by Swenson dated August 10, 2021, shown on Figure 2.

Site Access

Vehicle site access was evaluated to determine the adequacy of the site driveway with regard to stopping sight distance and traffic volumes. The project generated traffic would access the site via a proposed full-access driveway on Front Street approximately 300 feet south of Soquel Avenue. According to the City of Santa Cruz Downtown Plan, developments within Downtown Parking District #1

are permitted to have a maximum of one driveway per property or at a spacing of at least 200 feet and driveway width should be no more than 24 feet. According to the site plan, there is one full-access driveway proposed with a width of 22 feet, which meets the City's standard.

Project Driveway Access

An analysis of the southbound left-turn movement at the project driveway was conducted to determine if the project would cause any operational issues. The project driveway would be on Front Street approximately 300 feet south of Soquel Avenue. Front Street is a two-way, north-south street with two lanes in the south direction and one lane in the north direction at the project driveway. Front Street is divided by a solid double yellow line. Front Street does not have a left turn lane for the southbound direction for vehicles turning left into the project site. Thus, vehicles turning left would have to stop in the center-most southbound through lane and wait for a gap in the opposing traffic. As shown in Table 4, there would be 15 inbound and 46 outbound trips at the full-access driveway during the AM peak hour, and 28 inbound and 17 outbound trips during the PM peak hour. Of the inbound traffic in both peak hours, 11 vehicles would make left turns during the AM peak hour and 21 vehicles would make left turns during the PM peak hour.

The time between arrivals was compared to the critical gap and follow-up times to determine the number of vehicles that could successfully complete the southbound left-turn movement during the AM and PM peak hours. According to the Highway Capacity Manual, the minimum gap time required for a vehicle to turn left from Front Street into the project driveway is 4.1 seconds. Subsequent vehicles attempting to make a left turn would require 2.2 seconds in follow-up time in addition to minimum gap of 4.1 seconds. Based on the analysis of northbound left turns, there are sufficient gaps to accommodate up to 1,263 and 1,139 southbound left turns during the AM and PM peak hours, respectively. The modest project traffic volume would not face any delays in getting into and out of the garage.

The vehicle queuing analysis for the southbound left-turn movement into the project driveway was also conducted. As shown in Table 8, the estimated 95th percentile queue for the vehicles turning left from southbound Soquel Avenue into the project driveway is approximately 75 feet (3 vehicles) in the AM peak hour and 100 feet (4 vehicles) in the PM peak hour. The total storage provided between the project driveway and Soquel Avenue at the inner most southbound lane is approximately 300 feet (6 vehicles). Thus, the southbound left-turn traffic into the project driveway should not impact the two through lanes of traffic along southbound Soquel Avenue.

Sight Distance

The proposed project driveway should be free and clear of any obstructions to optimize sight distance. Providing the appropriate sight distance reduces the likelihood of a collision at the driveway and provides drivers with the ability to locate sufficient gaps in traffic and exit the site. There are no landscaping features shown on the site plan between Front Street and the driveway. Vehicles using the driveway would have sufficient sight distance in both directions and would be able to see vehicles on Front Street. A pedestrian warning device is recommended at the driveway exit to alert pedestrians of outgoing vehicles.

On-site Circulation

On-site circulation was reviewed in accordance with generally accepted traffic engineering standards. The project would have a full-access driveway on Front Street that leads into the parking garage. In the garage, there would be a drive aisle that leads to the parking spaces. The drive aisle width is shown to be approximately 24 feet. The width of the drive aisle would provide sufficient space for vehicles to back out of the parking stalls. The site plan shows a dead-end parking aisle. Generally, dead-end aisles are undesirable because vehicles finding all parking spaces occupied would need to back out. The project would implement an electronic notification system to indicate vacant spaces within the parking

garage. Thus, there would be no reason for a vehicle to enter the dead end aisle unless a space were available.

Bicycle parking is shown in the garage. Long-term bicycle parking is located on the east side of the project site. There is also a bike café located next to the parking garage entrance for tenants to store and work on their bicycles. A walk path within the garage provides access between the long-term bicycle storage and the bike café.

The project was checked relative to the City's loading space requirements. According to the Santa Cruz Municipal Code, off-street loading areas shall be provided for retail uses with 10,000 square feet or more. For retail uses with 10,000 to 24,999 square feet, 1 loading space shall be provided. The project proposes 5,259 square feet of retail use and 2,286 square feet of restaurant use. Since the total commercial use would be less than 10,000 square feet, no loading space is required. For the residential units, loading spaces are not required. However, parking spaces are currently provided in front of the site. Residents can use the parking spaces in front of the site near the lobby/leasing area for unloading/loading.

Front Street Improvements

As mentioned in the previous section, a continuous two-way left-turn lane (TWLTL) along Front Street would be implemented that could be used by inbound and outbound traffic from all driveways. The TWLTL would extend from Soquel Avenue to Laurel Street. With the implementation of this continuous two-way left-turn lane, on-street parking on both sides of the street would be eliminated.

Front Street, from Soquel Avenue to Cathcart Street, would consist of Class II bike lanes on both sides of Front Street, two southbound travel lanes, one center turn lane, and one northbound travel lane. The southbound travel lanes would merge into a single lane south of Cathcart Street. From Cathcart Street to Laurel Street, Front Street would have Class II buffered bike lanes along both sides, one southbound travel lane, one center lane, and one northbound travel lane. At the Front Street and Laurel Street signalized intersection, the southbound travel lane would widen to provide one left turn lane, one through lane, and one right turn lane with bike sharrow markings.

Figure 12 shows the proposed Front Street plans.

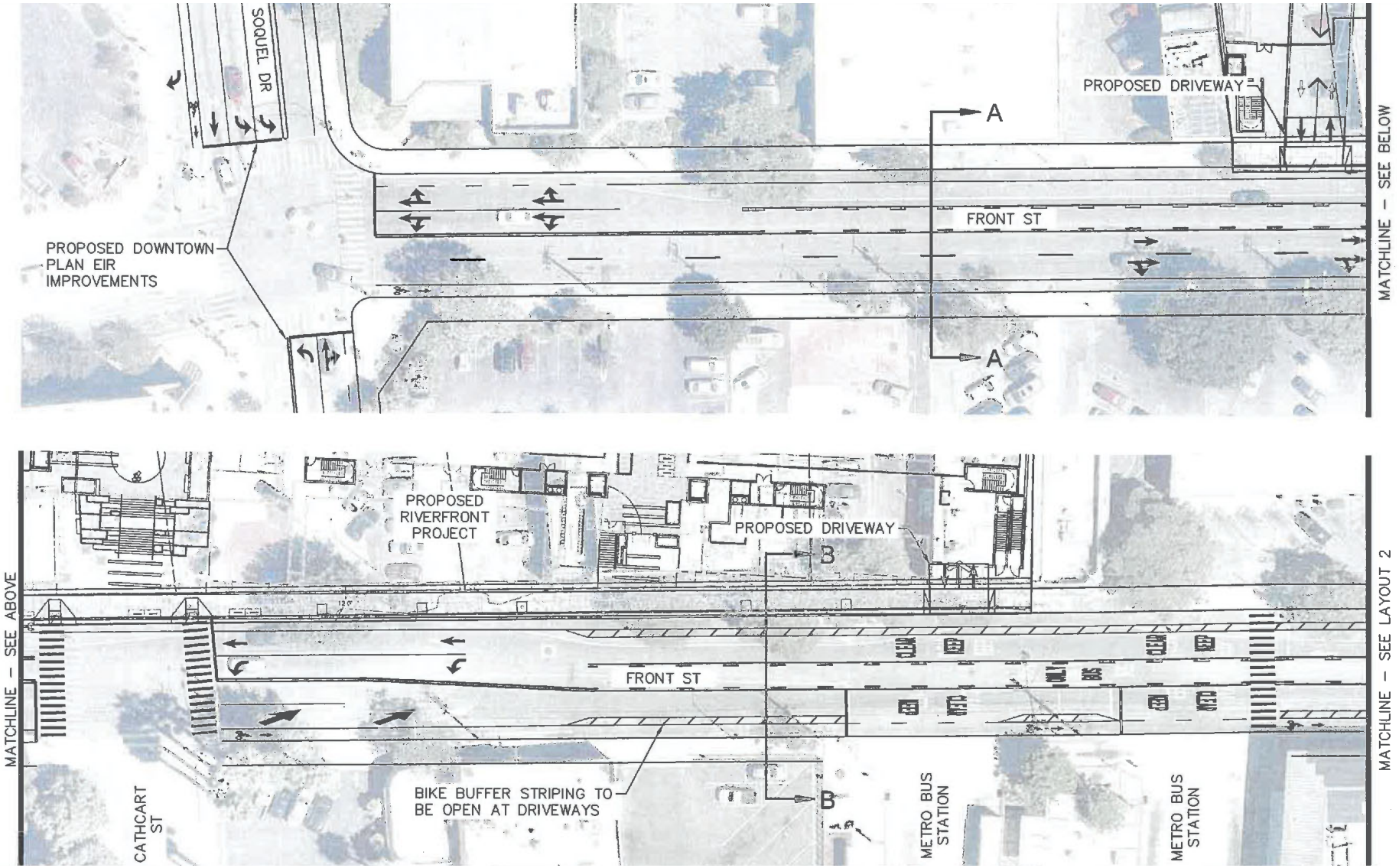


Figure 12
Proposed Front Street Plans

NORTH
Not to Scale

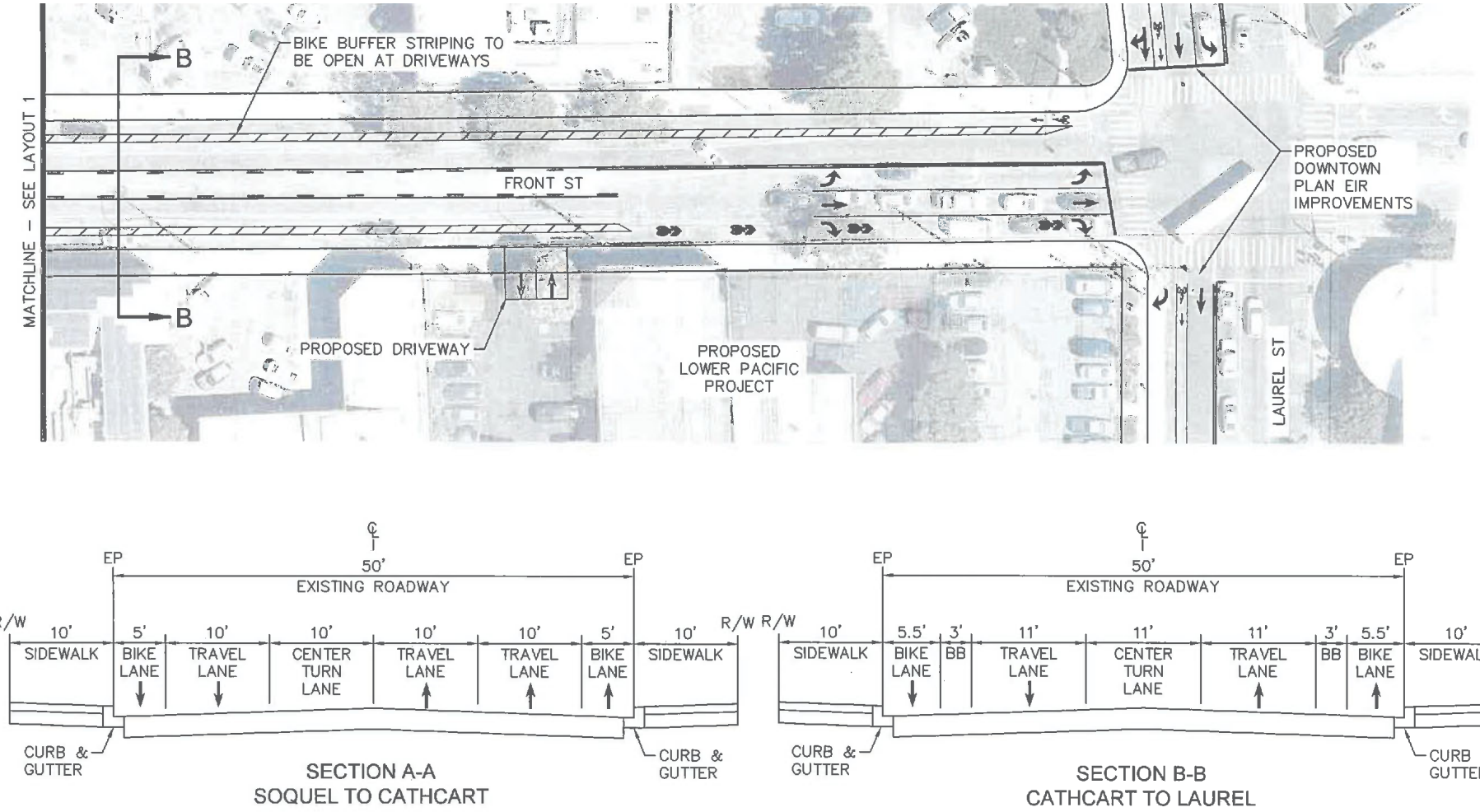


Figure 12 (Continued)
Proposed Front Street Plans

NORTH
Not to Scale

Parking

Vehicle Parking

The proposed project would provide Below Market Rate (BMR) units. According to State Density Bonus Law and the City of Santa Cruz Municipal Code, the project is eligible for a density bonus, concessions/incentives, waivers and reduced on-site parking requirements.

If the units in the development are affordable to lower-income households, except the manager's unit(s), and the project is located within one-half mile of a major transit stop, and there is unobstructed access to the major transit stop from the development, then, upon the request of the developer, a city, shall not impose a vehicular parking ratio, inclusive of handicapped guest parking, that exceeds 0.5 spaces per bedroom. A development has unobstructed access to a major transit stop if a resident is able to access the major transit stop without encountering natural or constructed impediments.

The proposed project would provide affordable and lower-income units. In addition, the development is located is located within one-mile of a major transit stop and has unobstructed access to the major transit stop. Thus, State Density Law's reduced parking ratios apply to the project development, if so requested by the project applicant.

The project would include 116 micro apartments, 53 studio apartments, 102 1-bedroom apartments, and 5 2-bedroom apartments. Thus, under the State Density Bonus Law, the project would need to provide 141 parking spaces.

The project also proposes restaurant and retail uses on the site. The project proposes to construct 2,286 square feet of restaurant use and 5,259 square feet of retail use. Since the project is located in Parking District #1, the vehicle requirement for restaurant and retail uses is 1 parking space per 400 square feet. Therefore, the project is required to provide a minimum of 19 parking spaces for restaurant and retail uses. Thus, the total required parking is 160 spaces.

The project is proposing 185 spaces, which exceeds the minimum parking requirement. The project proposes to install stacked parking systems in the parking garage for residential parking. The standard parking spaces would be used by the employees of the retail use and guests. It is assumed that some vehicles traveling to this location for the restaurant and commercial uses would utilize the public lots and garages within the area, with the nearest public parking garage located at the northwest corner of Front Street and Soquel Avenue.

Bicycle Parking

According to the Santa Cruz Municipal Code, bicycle parking facilities are required for new buildings, additions or enlargements of an existing building, or for any change in the occupancy, except when the project property is located within Parking District #1. Since the project is located within Parking District #1, bicycle parking facilities are not required. However, the project provides bicycle parking and follows the bicycle parking requirements from the Santa Cruz Municipal Code. The bicycle parking requirement for a multifamily residential use is 1 space per unit with all of the bicycle spaces being long-term bicycle spaces. The project proposes 271 units, with 5 2-bedroom units. Therefore, the project would need to provide 276 long-term bicycle spaces. According to the site plan, the project proposes to provide 233 bicycle parking spaces.

6.
Vehicle Miles Traveled Analysis

In accordance with new CEQA guidelines, the City is currently transitioning from intersection LOS to vehicle miles traveled (VMT) for CEQA transportation analysis.

A project's VMT is compared to the appropriate thresholds of significance based on the project location and type of development. When assessing a residential project, the project's VMT is divided by the number of residents expected to occupy the project to determine the VMT per capita. When assessing an office project, the project's VMT is divided by the number of employees. When assessing a retail, the project's total VMT, as opposed to a per-capita or per-employee VMT metric, is measured. The total VMT for the region with and without the project is calculated. The difference between the two scenarios is the net change in total VMT that is attributable to the project.

To determine whether a project would result in CEQA transportation impacts related to VMT, the City has recommended thresholds for residential, office, and retail projects with local traffic.

The recommended thresholds are as follows:

Residential projects

A project may indicate a significant transportation impact if the anticipated VMT exceeds **both**

85% of Existing *city* household VMT per capita *and*

85% of Existing County household VMT per capita.

Office projects

A project may indicate a significant transportation impact if the anticipated VMT exceeds 85% of the existing County VMT per employee.

Retail projects

A net increase in the VMT rate for a specific use may indicate a significant transportation impact. It is assumed that local serving retail projects tend to shorten trips and therefore reduce VMT.

Other projects

Most VMT falls into the above categories but other projects should be reviewed on a case by case basis.

Based on the California T Travel Model, the City daily VMT per capita is 11.04, and the County daily VMT per capita is 15.41. The City VMT per employee is 20.06 and the County VMT per employee is 22.09.

Since the City daily VMT per capita (11.04) is less than 85% of the County daily VMT per capita (15.41), it can be assumed that the residential portion of the project will have a less-than significant VMT impact.

For the purpose of VMT evaluation, the trip estimates for the retail portion of the project site were treated as local-serving retail land use. According to the Governor's Office of Planning and Research (OPR) Technical Advisory Guidelines, retail development less than 50,000 square feet can be considered local-serving retail. The project proposes a 3,012 square feet of retail use on the ground floor, 2,286 square feet of restaurant use and 2,247 square feet of retail use on the second floor, which totals to 7,545 square feet. Therefore, it is assumed that local-serving retail projects will have a less-than significant VMT impact.

7. Conclusions

The potential impacts of the project were evaluated in accordance with the standards set forth by the City of Santa Cruz. The traffic study analyzed AM and PM peak-hour traffic conditions for seven intersections. Project impacts on site access, on-site circulation, and other transportation facilities, such as bicycle facilities and transit service, were determined on the basis of engineering judgment.

Project Trip Estimates

The magnitude of traffic added to the roadway system by a particular development is estimated by multiplying the applicable trip generation rates by the size of the development. The trip generation rates published in the Institute of Transportation Engineers' (ITE) manual entitled *Trip Generation, 10th Edition* (2017) were used for this analysis. The rates published for Multifamily Housing – Mid-Rise (Land Use 221), Office Building (Land Use 710), Shopping Center (Land Use 820), and Quality Restaurant (Land Use 931) were used to estimate the trips generated by the proposed mixed-use project. The rate for the café was based on previous café applications in the City Santa Cruz. Based on these rates, the proposed project would generate 1,907 daily trips with 112 trips during the AM peak hour and 159 trips during the PM peak hour.

The existing office, restaurant, and retail uses can be credited against the proposed mixed-use development. The existing buildings' trip generation estimates are based on the average rates published by ITE. Based on the ITE rates, it is estimated that the existing buildings generate 888 daily trips with 10 trips during the AM peak hour and 85 trips during the PM peak hour.

The City of Santa Cruz allows a 40 percent trip reduction for mixed-use development in Downtown Santa Cruz to account for internal capture, walkability, bike-ability, and the existing Metro Transit Center as part of the City of Santa Cruz *Downtown Plan Amendment (DPA), July 2017*. Thus, a 40 percent reduction was applied to the proposed trip generation estimates.

After accounting for the trips generated by the existing businesses, the proposed mixed-use project is estimated to generate 611 new daily trips with a net increase of 61 trips in the AM peak hour and a net increase of 45 trips in the PM peak hour.

Intersection Levels of Service

Existing Plus Project Intersection Level of Service

The intersection level of service analysis results show that all study intersections would operate at acceptable levels of service during both AM and PM peak hours under existing plus project conditions. It should be noted that, at some study intersections, the average delay under project conditions is shown to be better than under no-project conditions. This occurs because the project would result in a reduction in traffic for several of the intersection movements.

Cumulative Intersection Levels of Service

The results of the level of service analysis under cumulative conditions show that the following intersections would operate at unacceptable levels of service during the PM peak hour, both with and without the project:

- Front Street & Soquel Avenue
- Front Street & Laurel Street

The project would contribute traffic to these deficient intersections.

Mitigation Measures

The Downtown Plan Amendments EIR has identified several roadway improvements for which the costs would be covered by anticipated future development projects. Estimated engineering costs for these improvements were estimated, and the 530 Front Street's fair share payment was calculated based on its cumulative impacts caused at the study intersections.

The project's fair share is estimated to be 13.31%. This is based on the 45 PM peak hour project trips divided by the Downtown Plan Amendments' 293 PM peak hour net new trips plus the project's PM peak hour net new trips (45/338 = 13.31%).

Front Street and Soquel Avenue

Mitigation: The significant cumulative impact at this intersection could be mitigated by adding a second westbound left-turn lane. The centerline median would be shifted south, and the east leg would be reduced to one through lane between Front Street and River Street. The westbound shared through-left lane would be converted into a through-lane. The signal timing and phasing would be optimized.

The cost for the construction of this improvement is estimated to be $599,000 based on the 508 Front Street TIA study. With this improvement, the intersection would operate at an acceptable LOS D during the PM peak hour.

Front Street and Laurel Street

Mitigation: The significant cumulative impact at this intersection could be mitigated by converting the westbound right-turn lane into a shared through-right lane. The west leg would be widened to provide a receiving lane between Pacific Avenue and Front Street, relocating sidewalk, utilities, and landscaping. A right-turn overlap phase would be provided for the northbound and southbound approaches.

The cost for the construction of this improvement is estimated to be $599,000 based on the 508 Front Street TIA study. With this improvement, the intersection would operate at an acceptable LOS D during the PM peak hour.

Pacific Avenue and Laurel Street

Impact: Although this intersection was not included in this study, the addition of project traffic to this intersection would continue to operate at LOS E during Cumulative Plus Project conditions based on the 508 Front Street TIA study. This constitutes a significant impact according to the thresholds established by the City of Santa Cruz.

Mitigation: The significant cumulative impact at this intersection could be mitigated by the construction of a southbound left-turn lane and removing the existing landscape median.

The estimated engineering cost for the construction of this improvement is estimated to be approximately $313,000 based on the 508 Front Street TIA study. With this improvement, the intersection would operate at an acceptable LOS D during the PM peak hour.

Front Street Improvements

Under the direction of the City of Santa Cruz, a continuous two-way left-turn lane (TWLTL) along Front Street would be implemented that could be used by inbound and outbound traffic from all driveways. The TWLTL would extend from Soquel Avenue to Laurel Street. With the implementation of this continuous two-way left-turn lane, on-street parking on both sides of the street would be eliminated. Continuous Class bike lanes and Class II buffered bike lanes would be provided with the restriping of Front Street.

The cost to construct these improvements is estimated to be $169,000 based on the 508 Front Street TIA study.

Project Driveway Access

An analysis of the southbound left-turn movement at the project driveway was conducted to determine if the project would cause any operational issues. The project driveway would be on Front Street approximately 300 feet south of Soquel Avenue. Front Street is a two-way, north-south street with two lanes in the south direction and one lane in the north direction at the project driveway. Front Street is divided by a solid double yellow line. Front Street does not have a left turn lane for the southbound direction for vehicles turning left into the project site. Thus, vehicles turning left would have to stop in the center-most southbound through lane and wait for a gap in the opposing traffic.

The vehicle queuing analysis for the southbound left-turn movement into the project driveway was also conducted. The estimated 95th percentile queue for the vehicles turning left from southbound Soquel Avenue into the project driveway is approximately 75 feet (3 vehicles) in the AM peak hour and 100 feet (4 vehicles) in the PM peak hour. The total storage provided between the project driveway and Soquel Avenue at the inner most southbound lane is approximately 300 feet (6 vehicles). Thus, the southbound left-turn traffic into the project driveway should not impact the two through lanes of traffic along southbound Soquel Avenue.

A pedestrian warning device is recommended at the driveway exit to alert pedestrians of outgoing vehicles.

Parking

The proposed project would provide affordable and lower-income units. In addition, the development is located is located within one-mile of a major transit stop and has unobstructed access to the major

transit stop. Thus, the State Density Law's reduced parking ratios apply to the project, if so requested by the project applicant.

Under the State Density Bonus Law, the project would need to provide 141 parking spaces.

The project also proposes restaurant and retail uses on the site. The project proposes to construct 2,286 square feet of restaurant use and 5,259 square feet of retail use. Since the project is located in Parking District #1, the vehicle requirement for restaurant and retail uses is 1 parking space per 400 square feet. Therefore, the project is required to provide a minimum of 19 parking spaces for restaurant and retail uses. Thus, the total required parking is 160 spaces.

The project is proposing 185 spaces, which exceeds the minimum parking requirement. It is assumed that some vehicles traveling to this location for the restaurant and commercial uses would utilize the public lots and garages within the area, with the nearest public parking garage located at the northwest corner of Front Street and Soquel Avenue.

According to the Santa Cruz Municipal Code, bicycle parking facilities are required for new buildings, additions or enlargements of an existing building, or for any change in the occupancy, except when the project property is located within Parking District #1. Since the project is located within Parking District #1, bicycle parking facilities are not required. However, the project provides bicycle parking and follows the bicycle parking requirements from the Santa Cruz Municipal Code. The bicycle parking requirement for a multifamily residential use is 1 space per unit with all of the bicycle spaces being long-term bicycle spaces. The project proposes 271 units, with 5 2-bedroom units. Therefore, the project would need to provide 276 long-term bicycle spaces. According to the site plan, the project proposes to provide 233 bicycle parking spaces.

Vehicle Miles Traveled (VMT) Analysis

Based on the California T Travel Model, the City daily VMT per capita is 11.04, and the County VMT per capita is 15.41. The City daily VMT per employee is 20.06, and the County VMT per employee is 22.09.

Since the City daily VMT per capita (11.04) is less than 85% of the County daily VMT per capita (15.41), it can be assumed that the residential portion of the project will have a less-than significant VMT impact.

For the purpose of VMT evaluation, the trip estimates for the retail portion of the project site were treated as local-serving retail land use. According to the Governor's Office of Planning and Research (OPR) Technical Advisory Guidelines, retail development less than 50,000 square feet can be considered local-serving retail. The project proposes a 3,012 square feet of retail use on the ground floor, 2,286 square feet of restaurant use and 2,247 square feet of retail use on the second floor, which totals to 7,545 square feet. Therefore, it is assumed that local-serving retail projects will have a less-than significant VMT impact.

530 Front Street
Traffic impact Analysis

Technical Appendices

August 2021

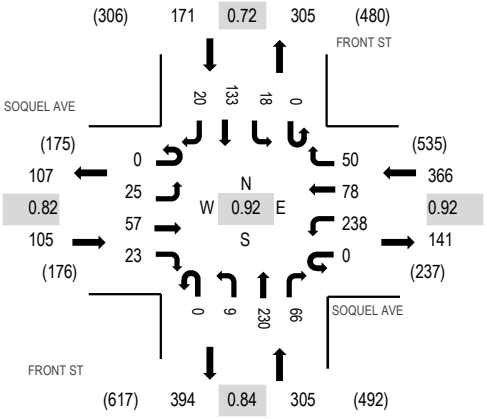
Appendix A

Traffic Counts

All Traffic Data Services Inc.
(303) 216-2439
www.alltrafficdata.net

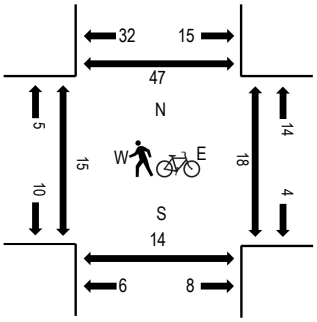
Location: 1 FRONT ST & SOQUEL AVE AM
Date: Tuesday, May 14, 2019
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:45 AM - 09:00 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



Traffic Counts

Interval Start Time	SOQUEL AVE Eastbound				SOQUEL AVE Westbound				FRONT ST Northbound				FRONT ST Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	0	2	9	4	0	23	5	5	0	0	25	9	0	2	25	5	114	562	0	1	3	6
7:15 AM	0	1	8	3	0	25	7	1	0	2	35	7	0	4	29	2	124	664	0	2	2	3
7:30 AM	0	4	6	5	0	16	9	8	0	0	41	14	0	5	24	4	136	768	1	3	1	2
7:45 AM	0	5	19	5	0	36	26	8	0	4	40	10	0	3	28	4	188	877	4	1	4	5
8:00 AM	0	9	19	6	0	50	14	8	0	3	57	17	0	4	27	2	216	947	0	2	1	9
8:15 AM	0	7	20	4	0	66	16	15	0	3	45	13	0	5	31	3	228		9	8	6	4
8:30 AM	0	6	9	2	0	63	21	13	0	2	74	15	0	6	30	4	245		2	3	5	9
8:45 AM	0	3	9	11	0	59	27	14	0	1	54	21	0	3	45	11	258		3	4	2	16

Peak Rolling Hour Flow Rates

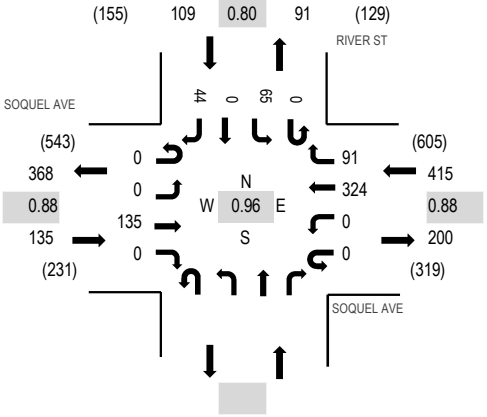
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	1	0	0	2	0	0	0	0	0	2	0	0	0	0	5
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	25	53	20	0	223	74	49	0	9	219	58	0	18	108	20	876
Mediums	0	0	3	3	0	13	4	1	0	0	11	6	0	0	25	0	66
Total	0	25	57	23	0	238	78	50	0	9	230	66	0	18	133	20	947

All Traffic Data Services Inc.

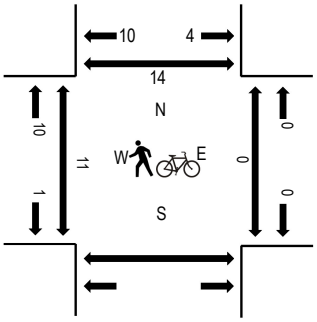
(303) 216-2439
www.alltrafficdata.net

Location: 2 RIVER ST & SOQUEL AVE AM
Date: Tuesday, May 14, 2019
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:30 AM - 08:45 AM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	SOQUEL AVE Eastbound				SOQUEL AVE Westbound				Northbound				RIVER ST Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	0	0	20	0	0	0	29	5					0	4	0	5	63	332	0	0		3
7:15 AM	0	0	19	0	0	0	29	6					0	5	0	5	64	418	1	0		5
7:30 AM	0	0	24	0	0	0	30	9					0	6	0	4	73	525	3	0		4
7:45 AM	0	0	33	0	0	0	64	18					0	8	0	9	132	624	1	0		3
8:00 AM	0	0	40	0	0	0	72	17					0	17	0	3	149	659	1	0		2
8:15 AM	0	0	39	0	0	0	81	22					0	14	0	15	171		0	0		2
8:30 AM	0	0	28	0	0	0	90	28					0	13	0	13	172		1	0		4
8:45 AM	0	0	28	0	0	0	81	24					0	21	0	13	167		7	0		5

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	4	0	0	0	2	0					0	0	0	0	6
Bicycles on Road	0	0	0	0	0	0	0	0					0	0	0	0	0
Lights	0	0	123	0	0	0	304	90					0	62	0	41	620
Mediums	0	0	8	0	0	0	18	1					0	3	0	3	33
Total	0	0	135	0	0	0	324	91					0	65	0	44	659

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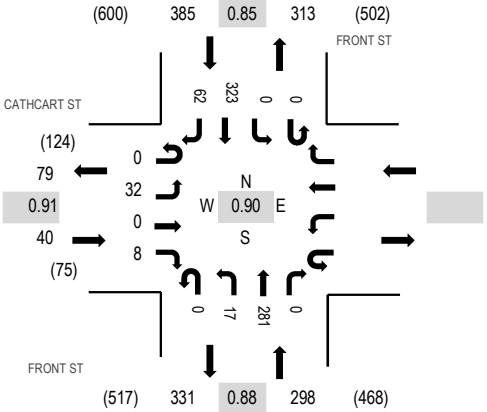
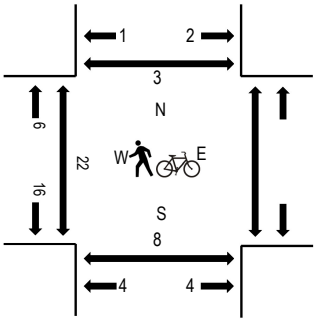
Location: 3 FRONT ST & CATHCART ST AM
Date: Tuesday, May 14, 2019
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:45 AM - 09:00 AM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	CATHCART ST Eastbound				CATHCART ST Westbound				FRONT ST Northbound				FRONT ST Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	0	8	0	3					0	1	26	0	0	0	45	8	91	420	4		0	2
7:15 AM	0	4	0	0					0	1	41	0	0	0	42	10	98	486	5		6	2
7:30 AM	0	9	0	3					0	2	46	0	0	0	37	6	103	563	6		2	0
7:45 AM	0	6	0	2					0	4	49	0	0	0	54	13	128	651	9		0	0
8:00 AM	0	7	0	1					0	3	68	0	0	0	67	11	157	723	3		2	0
8:15 AM	0	8	0	2					0	4	62	0	0	0	88	11	175		5		0	1
8:30 AM	0	7	0	4					0	2	83	0	0	0	82	13	191		6		1	0
8:45 AM	0	10	0	1					0	8	68	0	0	0	86	27	200		5		4	2

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0					0	0	4	0	0	0	3	0	7
Bicycles on Road	0	0	0	0					0	0	0	0	0	0	0	0	0
Lights	0	30	0	8					0	14	264	0	0	0	294	49	659
Mediums	0	2	0	0					0	3	13	0	0	0	26	13	57
Total	0	32	0	8					0	17	281	0	0	0	323	62	723

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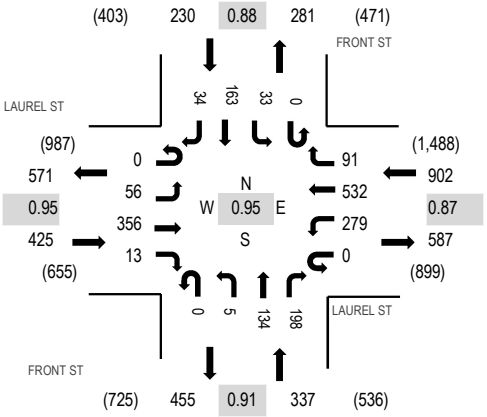
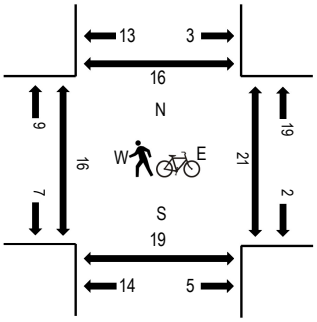
Location: 4 FRONT ST & LAUREL ST AM
Date: Tuesday, May 14, 2019
Peak Hour: 07:45 AM - 08:45 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



Traffic Counts

Interval Start Time	LAUREL ST Eastbound				LAUREL ST Westbound				FRONT ST Northbound				FRONT ST Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	0	5	24	1	0	17	61	16	0	0	9	16	0	1	20	5	175	1,219	1	3	1	3
7:15 AM	0	5	44	2	0	36	72	4	0	1	23	14	0	5	26	13	245	1,494	2	2	2	7
7:30 AM	0	6	51	2	0	36	113	15	0	0	25	24	0	4	20	7	303	1,718	5	6	2	3
7:45 AM	0	9	98	5	0	68	176	16	0	1	30	43	0	10	34	6	496	1,894	3	2	5	3
8:00 AM	0	15	86	5	0	65	117	17	0	1	36	47	0	11	41	9	450	1,863	5	7	5	7
8:15 AM	0	18	91	1	0	71	117	32	0	0	26	57	0	9	39	8	469		3	6	5	4
8:30 AM	0	14	81	2	0	75	122	26	0	3	42	51	0	3	49	11	479		5	1	2	1
8:45 AM	0	13	72	5	0	65	119	32	0	1	37	49	0	8	40	24	465		0	8	3	3

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	1	0	0	3	0	0	0	0	2	3	0	0	3	0	12
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	55	348	13	0	274	519	91	0	4	129	187	0	31	150	30	1,831
Mediums	0	1	7	0	0	2	13	0	0	1	3	8	0	2	10	4	51
Total	0	56	356	13	0	279	532	91	0	5	134	198	0	33	163	34	1,894

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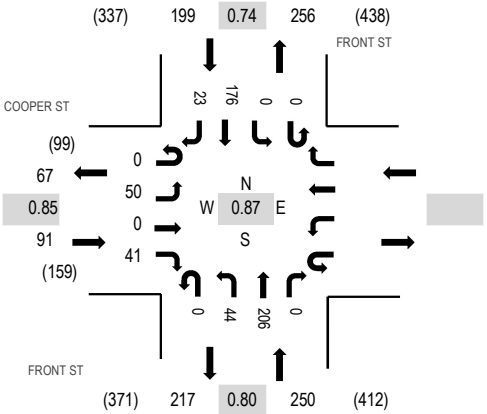
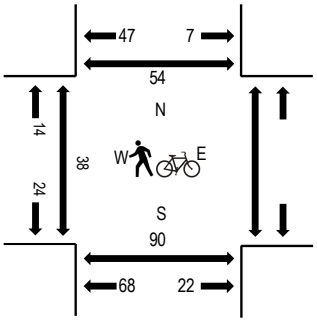
Location: 5 FRONT ST & COOPER ST AM
Date: Tuesday, May 14, 2019
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:30 AM - 08:45 AM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	COOPER ST Eastbound				Westbound				FRONT ST Northbound				FRONT ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	13	0	5					0	3	28	0	0	0	32	3	84	368	4		2	0
7:15 AM	0	8	0	7					0	4	34	0	0	0	30	1	84	390	5		7	1
7:30 AM	0	8	0	8					0	5	36	0	0	0	22	5	84	433	9		7	6
7:45 AM	0	11	0	8					0	8	44	0	0	0	42	3	116	504	6		12	8
8:00 AM	0	10	0	12					0	1	55	0	0	0	28	0	106	540	8		16	3
8:15 AM	0	16	0	11					0	11	38	0	0	0	42	9	127		7		26	7
8:30 AM	0	17	0	7					0	12	66	0	0	0	47	6	155		8		19	16
8:45 AM	0	7	0	11					0	20	47	0	0	0	59	8	152		13		26	26

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	1					0	0	0	0	0	0	0	0	1
Bicycles on Road	0	0	0	0					0	0	0	0	0	0	0	0	0
Lights	0	50	0	39					0	44	195	0	0	0	153	22	503
Mediums	0	0	0	1					0	0	11	0	0	0	23	1	36
Total	0	50	0	41					0	44	206	0	0	0	176	23	540

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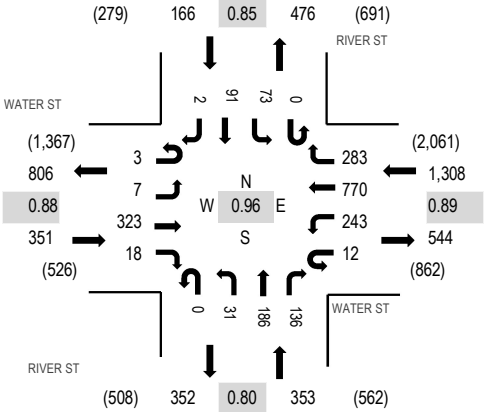
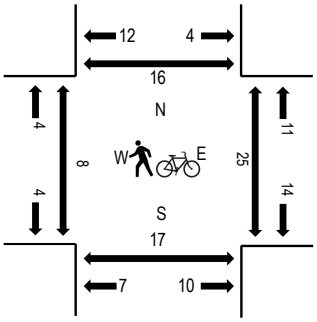
Location: 6 RIVER ST & WATER ST AM
Date: Tuesday, May 14, 2019
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:30 AM - 08:45 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



Traffic Counts

Interval Start Time	WATER ST Eastbound				WATER ST Westbound				RIVER ST Northbound				RIVER ST Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	0	0	20	1	3	14	73	12	0	3	21	18	0	7	10	2	184	1,250	0	3	5	4
7:15 AM	0	2	26	1	1	15	104	30	0	6	27	16	0	10	12	1	251	1,592	1	3	2	2
7:30 AM	0	1	37	3	5	21	147	24	0	6	28	22	0	18	14	2	328	1,872	1	2	2	1
7:45 AM	0	4	76	4	4	49	211	40	0	5	26	31	0	24	12	1	487	2,110	3	6	3	4
8:00 AM	0	0	96	8	4	37	179	74	0	7	48	30	0	20	22	1	526	2,178	1	4	2	2
8:15 AM	3	1	85	3	5	76	175	68	0	7	42	31	0	14	20	1	531		2	7	6	2
8:30 AM	0	3	80	1	1	61	187	74	0	11	57	42	0	22	27	0	566		2	5	4	4
8:45 AM	0	3	62	6	2	69	229	67	0	6	39	33	0	17	22	0	555		3	7	4	5

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	2
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	3	7	315	17	12	229	757	276	0	31	182	127	0	68	86	2	2,112
Mediums	0	0	8	1	0	14	12	7	0	0	4	9	0	4	5	0	64
Total	3	7	323	18	12	243	770	283	0	31	186	136	0	73	91	2	2,178

All Traffic Data Services Inc.

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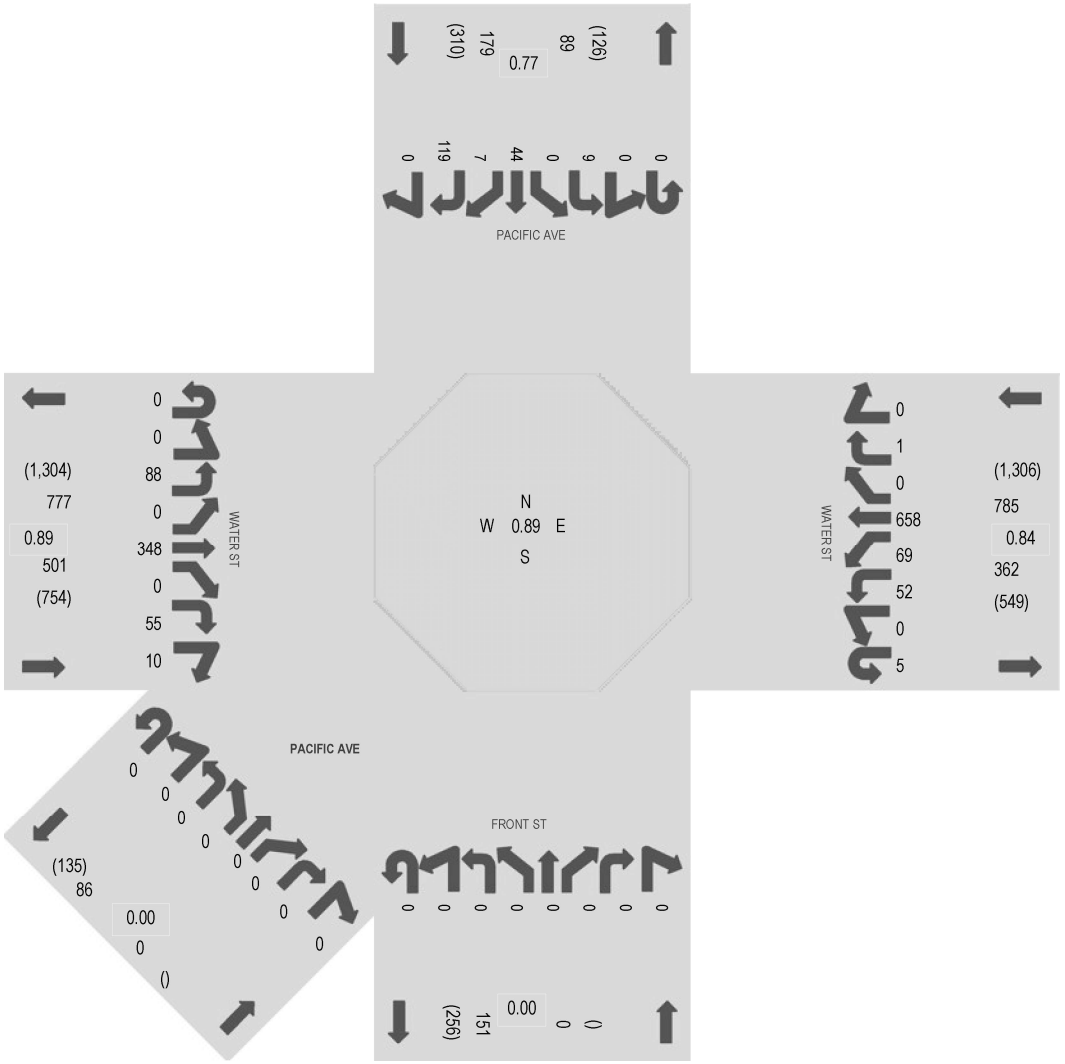
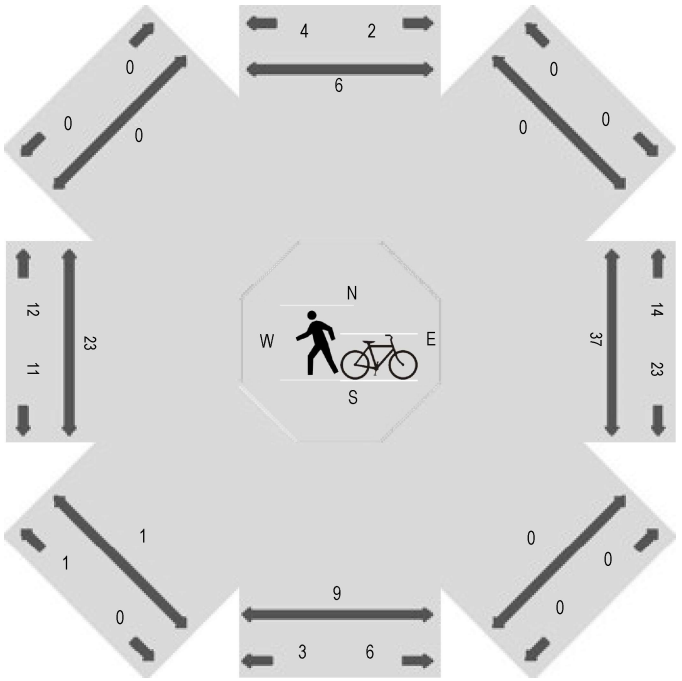
Location: 7 FRONT ST & WATER ST AM
Date: Tuesday, May 14, 2019
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:45 AM - 09:00 AM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	Westbound								Northwestbound								Northbound								Northeastbound								Total	Rolling Hour
	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR		
7:00 AM	0	0	9	3	60	0	0	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7:15 AM	0	0	11	6	95	0	0	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7:30 AM	0	0	11	11	109	0	0	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7:45 AM	0	0	5	14	187	0	0	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8:00 AM	0	0	7	10	165	0	0	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8:15 AM	0	0	13	11	154	0	0	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8:30 AM	4	0	19	18	149	0	0	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8:45 AM	1	0	13	30	190	0	1	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Count Total	5	0	88	103	1,109	0	1	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Peak Hour	5	0	52	69	658	0	1	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Interval Start Time	Eastbound								Southeastbound								Southbound								Southwestbound								Total	Rolling Hour
	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR		
7:00 AM	0	0	6	0	23	0	5	1									0	0	0	0	13	3	15	0									138	905
7:15 AM	0	0	5	0	31	0	3	0									0	0	0	0	6	0	15	0									172	1,115
7:30 AM	0	0	6	0	45	0	6	1									0	0	1	0	11	4	18	0									223	1,289
7:45 AM	0	0	20	0	86	0	12	3									0	0	1	0	13	3	28	0									372	1,424
8:00 AM	0	0	21	0	107	0	12	1									0	0	1	0	5	1	18	0									348	1,465
8:15 AM	0	0	17	0	83	0	13	5									0	0	3	0	13	3	31	0									346	
8:30 AM	0	0	22	0	86	0	12	2									0	0	1	0	10	0	35	0									358	
8:45 AM	0	0	28	0	72	0	18	2									0	0	4	0	16	3	35	0									413	
Count Total	0	0	125	0	533	0	81	15									0	0	11	0	87	17	195	0									2,370	
Peak Hour	0	0	88	0	348	0	55	10									0	0	9	0	44	7	119	0									1,465	

Peak Rolling Hour Flow Rates

Vehicle Type	Westbound								Northwestbound								Northbound								Northeastbound							
	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR
Articulated Trucks	0	0	0	0	2	0	0	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles on Road	0	0	0	0	0	0	0	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	5	0	52	69	645	0	1	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mediums	0	0	0	0	11	0	0	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	5	0	52	69	658	0	1	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Vehicle Type	Eastbound								Southeastbound								Southbound								Southwestbound								
	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR	Total
Articulated Trucks	0	0	0	0	0	0	0	0									0	0	0	0	0	0	0	0									2
Bicycles on Road	0	0	0	0	0	0	0	0									0	0	0	0	0	0	0	0									0
Lights	0	0	88	0	339	0	50	8									0	0	9	0	38	6	111	0									1,421
Mediums	0	0	0	0	9	0	5	2									0	0	0	0	6	1	8	0									42
Count Total	0	0	88	0	348	0	55	10									0	0	9	0	44	7	119	0									1,465

All Traffic Data Services Inc.

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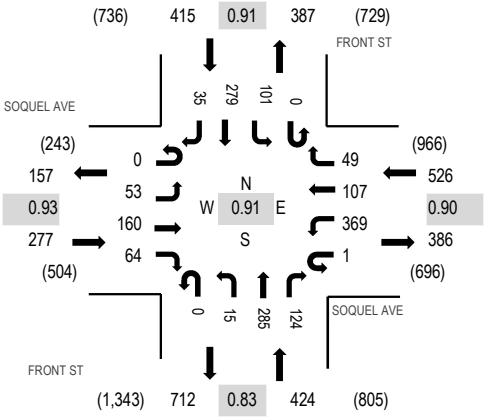
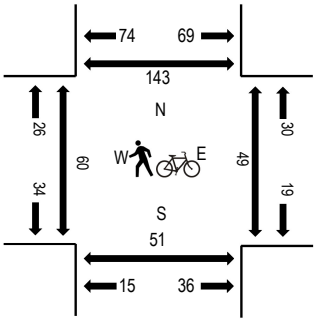
Location: 1 FRONT ST & SOQUEL AVE PM
Date: Tuesday, May 14, 2019
Peak Hour: 05:00 PM - 06:00 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



Traffic Counts

Interval Start Time	SOQUEL AVE Eastbound				SOQUEL AVE Westbound				FRONT ST Northbound				FRONT ST Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
4:00 PM	0	15	31	12	0	70	20	10	0	1	48	25	0	14	61	3	310	1,369	8	23	16	30
4:15 PM	0	8	32	11	0	80	9	11	0	2	81	39	0	22	63	6	364	1,510	13	12	17	23
4:30 PM	0	8	26	16	0	96	18	12	0	1	63	28	0	11	54	9	342	1,553	13	6	6	24
4:45 PM	0	14	41	13	1	99	8	6	0	1	66	26	0	14	56	8	353	1,628	8	11	8	36
5:00 PM	0	6	53	17	0	95	31	19	0	3	81	32	0	27	79	8	451	1,642	5	9	7	39
5:15 PM	0	15	35	21	1	101	26	13	0	6	56	23	0	30	68	12	407		9	7	10	25
5:30 PM	0	15	40	13	0	111	34	9	0	2	56	37	0	19	71	10	417		18	13	13	34
5:45 PM	0	17	32	13	0	62	16	8	0	4	92	32	0	25	61	5	367		13	19	19	30

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	53	159	64	1	361	107	48	0	15	268	119	0	101	265	35	1,596
Mediums	0	0	1	0	0	8	0	1	0	0	17	5	0	0	14	0	46
Total	0	53	160	64	1	369	107	49	0	15	285	124	0	101	279	35	1,642

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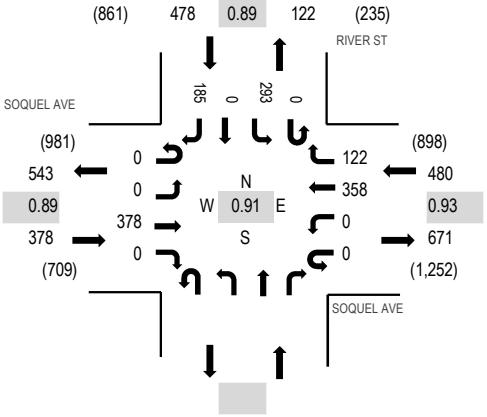
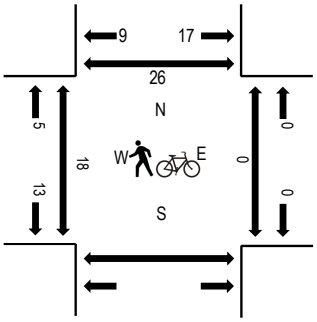
Location: 2 RIVER ST & SOQUEL AVE PM
Date: Tuesday, May 14, 2019
Peak Hour: 04:45 PM - 05:45 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	SOQUEL AVE Eastbound				SOQUEL AVE Westbound				Northbound				RIVER ST Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
4:00 PM	0	0	73	0	0	0	78	24					0	63	0	26	264	1,145	6	0		7
4:15 PM	0	0	99	0	0	0	76	21					0	67	0	35	298	1,249	4	0		4
4:30 PM	0	0	70	0	0	0	87	33					0	57	0	43	290	1,292	3	0		7
4:45 PM	0	0	84	0	0	0	71	33					0	62	0	43	293	1,336	4	0		10
5:00 PM	0	0	108	0	0	0	88	37					0	89	0	46	368	1,323	4	0		6
5:15 PM	0	0	90	0	0	0	102	27					0	76	0	46	341		3	0		2
5:30 PM	0	0	96	0	0	0	97	25					0	66	0	50	334		3	0		8
5:45 PM	0	0	89	0	0	0	64	35					0	63	0	29	280		15	0		4

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0					0	0	0	0	0
Bicycles on Road	0	0	0	0	0	0	0	0					0	0	0	0	0
Lights	0	0	371	0	0	0	352	122					0	290	0	182	1,317
Mediums	0	0	7	0	0	0	6	0					0	3	0	3	19
Total	0	0	378	0	0	0	358	122					0	293	0	185	1,336

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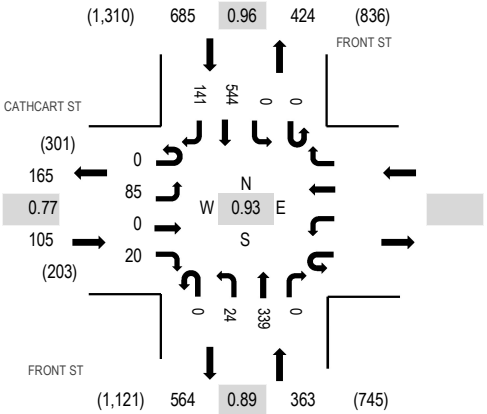
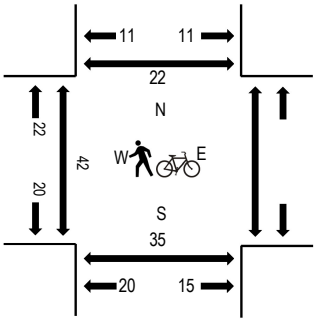
Location: 3 FRONT ST & CATHCART ST PM
Date: Tuesday, May 14, 2019
Peak Hour: 05:00 PM - 06:00 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	CATHCART ST Eastbound				CATHCART ST Westbound				FRONT ST Northbound				FRONT ST Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
4:00 PM	0	13	0	10					0	5	81	0	0	0	127	27	263	1,105	15		6	3
4:15 PM	0	20	0	8					0	11	100	0	2	0	131	22	294	1,152	12		3	5
4:30 PM	0	19	0	9					0	11	78	0	0	0	133	20	270	1,121	15		9	1
4:45 PM	0	15	0	4					0	12	84	0	0	0	135	28	278	1,145	8		6	1
5:00 PM	0	23	0	4					0	6	94	0	0	0	145	38	310	1,153	5		10	8
5:15 PM	0	13	0	4					0	4	66	0	0	0	138	38	263		14		9	4
5:30 PM	0	28	0	6					0	10	71	0	0	0	146	33	294		5		5	6
5:45 PM	0	21	0	6					0	4	108	0	0	0	115	32	286		12		9	3

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0					0	0	0	0	0	0	0	0	0
Bicycles on Road	0	0	0	0					0	0	0	0	0	0	0	0	0
Lights	0	78	0	20					0	22	323	0	0	0	532	133	1,108
Mediums	0	7	0	0					0	2	16	0	0	0	12	8	45
Total	0	85	0	20					0	24	339	0	0	0	544	141	1,153

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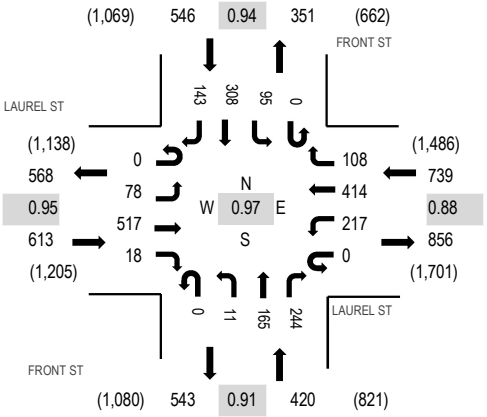
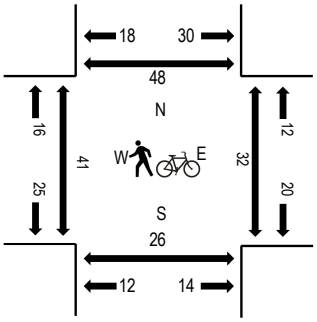
Location: 4 FRONT ST & LAUREL ST PM
Date: Tuesday, May 14, 2019
Peak Hour: 04:15 PM - 05:15 PM
Peak 15-Minutes: 04:15 PM - 04:30 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	LAUREL ST Eastbound				LAUREL ST Westbound				FRONT ST Northbound				FRONT ST Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
4:00 PM	0	18	116	6	0	60	93	21	0	0	39	79	0	22	73	39	566	2,298	13	11	6	8
4:15 PM	0	18	141	3	0	58	114	29	0	2	50	64	0	18	67	31	595	2,318	10	6	6	11
4:30 PM	0	23	130	2	0	51	90	21	0	6	35	59	0	19	88	40	564	2,317	14	12	8	13
4:45 PM	0	18	125	8	0	55	103	31	0	0	34	61	0	29	73	36	573	2,316	6	2	5	18
5:00 PM	0	19	121	5	0	53	107	27	0	3	46	60	0	29	80	36	586	2,283	9	5	6	4
5:15 PM	0	15	129	6	0	70	124	22	0	2	23	72	0	30	66	35	594		4	9	10	11
5:30 PM	0	20	121	3	0	42	98	23	0	2	33	71	0	25	86	39	563		4	9	12	11
5:45 PM	0	32	120	6	0	54	106	34	0	3	31	46	0	14	65	29	540		10	10	7	4

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	77	511	18	0	215	407	105	0	11	163	239	0	93	305	140	2,284
Mediums	0	1	6	0	0	2	7	3	0	0	2	5	0	2	3	3	34
Total	0	78	517	18	0	217	414	108	0	11	165	244	0	95	308	143	2,318

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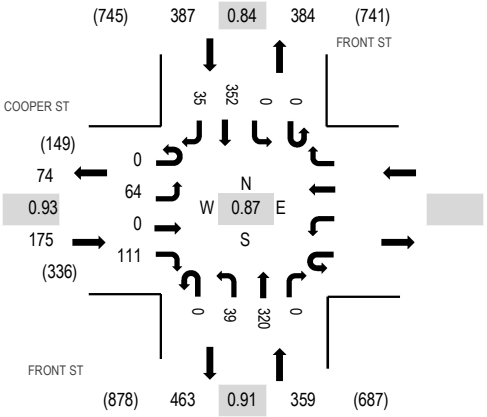
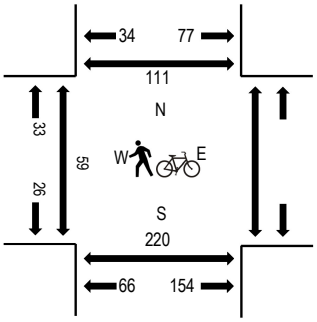
Location: 5 FRONT ST & COOPER ST PM
Date: Tuesday, May 14, 2019
Peak Hour: 05:00 PM - 06:00 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	COOPER ST Eastbound				Westbound				FRONT ST Northbound				FRONT ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	20	0	19					0	8	70	0	0	0	84	6	207	847	17		47	24
4:15 PM	0	19	0	22					0	9	81	0	0	0	79	10	220	905	19		52	21
4:30 PM	0	19	0	19					0	12	71	0	0	0	84	8	213	895	9		43	20
4:45 PM	0	17	0	26					0	17	60	0	0	0	82	5	207	916	13		44	14
5:00 PM	0	21	0	27					0	10	89	0	0	0	107	11	265	921	21		69	33
5:15 PM	0	15	0	31					0	10	66	0	0	0	82	6	210		10		57	21
5:30 PM	0	18	0	23					0	10	80	0	0	0	90	13	234		10		41	25
5:45 PM	0	10	0	30					0	9	85	0	0	0	73	5	212		14		47	31

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0					0	0	0	0	0	0	0	0	0
Bicycles on Road	0	0	0	0					0	0	0	0	0	0	0	0	0
Lights	0	64	0	111					0	38	302	0	0	0	336	35	886
Mediums	0	0	0	0					0	1	18	0	0	0	16	0	35
Total	0	64	0	111					0	39	320	0	0	0	352	35	921

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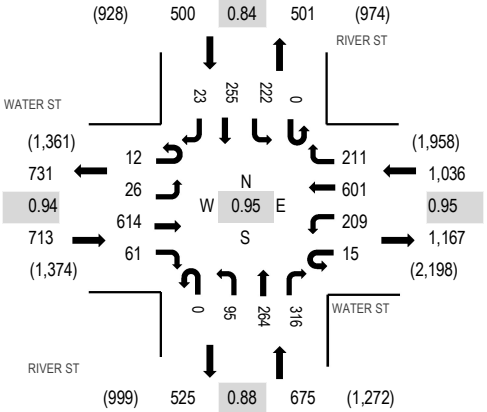
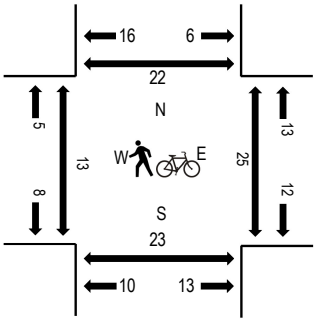
Location: 6 RIVER ST & WATER ST PM
Date: Tuesday, May 14, 2019
Peak Hour: 04:45 PM - 05:45 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



Traffic Counts

Interval Start Time	WATER ST Eastbound				WATER ST Westbound				RIVER ST Northbound				RIVER ST Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
4:00 PM	1	6	144	10	9	43	113	52	0	22	59	57	0	52	70	3	641	2,656	1	0	3	6
4:15 PM	1	9	129	16	6	43	146	55	0	29	61	61	0	42	46	4	648	2,785	4	7	12	5
4:30 PM	3	8	140	10	6	55	144	50	0	24	60	61	0	49	60	3	673	2,895	8	3	9	7
4:45 PM	5	10	125	13	6	55	153	62	0	26	52	63	0	51	68	5	694	2,924	4	10	8	8
5:00 PM	2	6	153	18	3	43	142	56	0	27	77	94	0	72	73	4	770	2,876	2	6	5	7
5:15 PM	4	4	173	17	4	56	163	54	0	23	71	87	0	45	48	9	758		1	2	3	2
5:30 PM	1	6	163	13	2	55	143	39	0	19	64	72	0	54	66	5	702		5	2	3	3
5:45 PM	0	7	161	16	3	51	113	33	0	19	73	71	0	40	54	5	646		3	1	4	5

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	12	25	611	61	15	200	599	208	0	95	260	305	0	220	253	23	2,887
Mediums	0	1	3	0	0	9	2	3	0	0	4	11	0	2	2	0	37
Total	12	26	614	61	15	209	601	211	0	95	264	316	0	222	255	23	2,924

All Traffic Data Services Inc.

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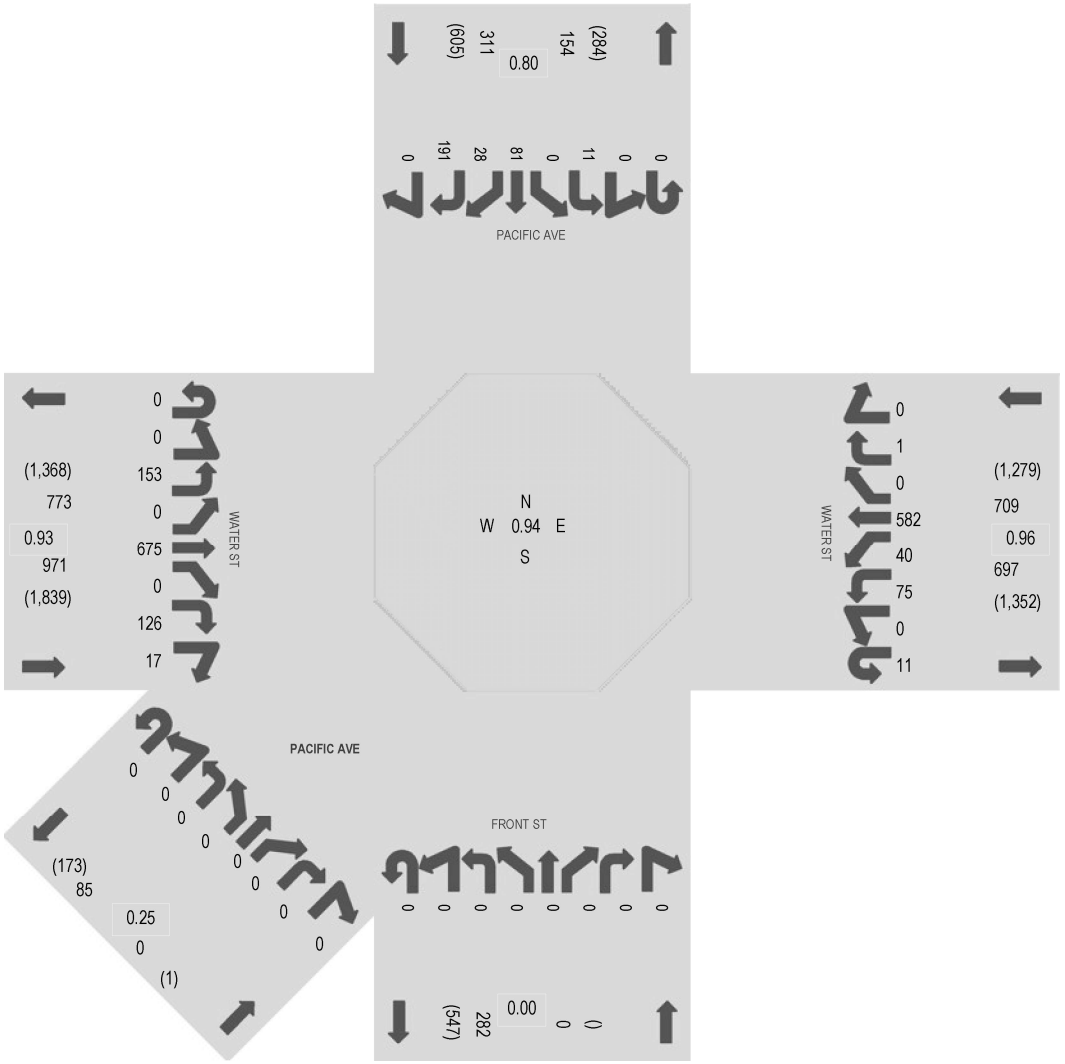
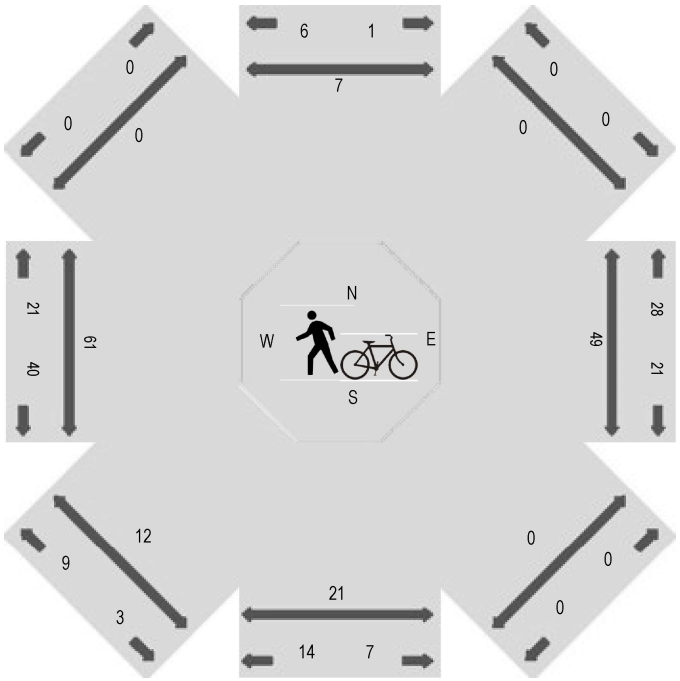
Location: 7 FRONT ST & WATER ST PM
Date: Tuesday, May 14, 2019
Peak Hour: 04:45 PM - 05:45 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	Westbound								Northwestbound								Northbound								Northeastbound							
	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR
4:00 PM	1	0	20	13	98	0	0	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	6	0	11	1	126	0	2	0									0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
4:30 PM	5	0	15	17	128	0	0	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	5	0	17	11	151	0	1	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	3	0	23	9	145	0	0	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	1	0	20	11	148	0	0	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	2	0	15	9	138	0	0	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	5	0	22	13	87	0	0	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	28	0	143	84	1,021	0	3	0									0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Peak Hour	11	0	75	40	582	0	1	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Interval Start Time	Eastbound								Southeastbound								Southbound								Southwestbound								Total	Rolling Hour
	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR		
4:00 PM	0	0	36	0	152	0	28	3									0	0	7	0	23	6	43	0									430	1,808
4:15 PM	0	0	31	0	151	0	26	4									0	0	2	0	28	9	42	0									440	1,907
4:30 PM	0	0	36	0	156	0	26	5									0	0	3	0	24	8	37	0									460	1,967
4:45 PM	0	0	39	0	147	0	34	4									0	0	4	0	18	5	42	0									478	1,991
5:00 PM	0	0	36	0	170	0	35	7									0	0	3	0	30	8	60	0									529	1,916
5:15 PM	0	0	33	0	178	0	26	2									0	0	3	0	19	9	50	0									500	
5:30 PM	0	0	45	0	180	0	31	4									0	0	1	0	14	6	39	0									484	
5:45 PM	0	0	25	0	161	0	26	2									0	0	6	0	16	7	33	0									403	
Count Total	0	0	281	0	1,295	0	232	31									0	0	29	0	172	58	346	0									3,724	
Peak Hour	0	0	153	0	675	0	126	17									0	0	11	0	81	28	191	0									1,991	

Peak Rolling Hour Flow Rates

Vehicle Type	Westbound								Northwestbound								Northbound								Northeastbound							
	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR
Articulated Trucks	0	0	0	0	0	0	0	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles on Road	0	0	0	0	0	0	0	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	11	0	75	40	579	0	1	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mediums	0	0	0	0	3	0	0	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	11	0	75	40	582	0	1	0									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Vehicle Type	Eastbound								Southeastbound								Southbound								Southwestbound								
	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR	U	HL	L	BL	T	BR	R	HR	Total
Articulated Trucks	0	0	0	0	0	0	0	0									0	0	0	0	0	0	0	0									0
Bicycles on Road	0	0	0	0	0	0	0	0									0	0	0	0	0	0	0	0									0
Lights	0	0	152	0	669	0	124	16									0	0	11	0	77	27	191	0									1,973
Mediums	0	0	1	0	6	0	2	1									0	0	0	0	4	1	0	0									18
Count Total	0	0	153	0	675	0	126	17									0	0	11	0	81	28	191	0									1,991

Appendix B

Level of Service Calculations

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	57	23	238	78	50	9	230	66	18	133	20
Future Volume (veh/h)	25	57	23	238	78	50	9	230	66	18	133	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	27	62	25	172	207	0	10	250	72	20	145	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	201	472	195	849	891		44	363	103	121	224	34
Arrive On Green	0.24	0.24	0.24	0.48	0.48	0.00	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	822	1933	800	1781	1870	1585	40	2564	725	1058	1586	241
Grp Volume(v), veh/h	60	0	54	172	207	0	176	0	156	20	0	167
Grp Sat Flow(s),veh/h/ln	1829	0	1726	1781	1870	1585	1757	0	1572	1058	0	1827
Q Serve(g_s), s	2.6	0.0	2.4	5.6	6.5	0.0	1.1	0.0	9.5	1.8	0.0	8.6
Cycle Q Clear(g_c), s	2.6	0.0	2.4	5.6	6.5	0.0	9.7	0.0	9.5	11.3	0.0	8.6
Prop In Lane	0.45		0.46	1.00		1.00	0.06		0.46	1.00		0.13
Lane Grp Cap(c), veh/h	446	0	421	849	891		287	0	222	121	0	258
V/C Ratio(X)	0.13	0.00	0.13	0.20	0.23		0.61	0.00	0.70	0.16	0.00	0.65
Avail Cap(c_a), veh/h	446	0	421	849	891		564	0	462	283	0	537
HCM 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
Upstream Filter(I)	1.00	0.00	1.00	0.91	0.91	0.00	0.98	0.00	0.98	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.5	0.0	29.5	15.2	15.4	0.0	40.8	0.0	40.9	46.3	0.0	40.6
Incr Delay (d2), s/veh	0.6	0.0	0.6	0.1	0.1	0.0	2.1	0.0	3.9	0.6	0.0	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	1.1	2.2	2.7	0.0	4.2	0.0	3.9	0.5	0.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.2	0.0	30.1	15.3	15.5	0.0	42.9	0.0	44.9	46.9	0.0	43.3
LnGrp LOS	C	A	C	B	B		D	A	D	D	A	D
Approach Vol, veh/h		114			379	A		332			187	
Approach Delay, s/veh		30.2			15.4			43.8			43.7	
Approach LOS		C			B			D			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		52.3		18.7		29.0		18.7				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		32.4		29.4		24.4		29.4				
Max Q Clear Time (g_c+I1), s		8.5		11.7		4.6		13.3				
Green Ext Time (p_c), s		1.7		1.8		0.5		0.8				

Intersection Summary		
HCM 6th Ctrl Delay		31.6
HCM 6th LOS		C

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	160	64	370	107	49	15	285	124	101	279	35
Future Volume (veh/h)	53	160	64	370	107	49	15	285	124	101	279	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	58	174	70	259	316	0	16	310	135	110	303	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	148	457	191	658	691		50	590	258	213	437	55
Arrive On Green	0.22	0.22	0.22	0.37	0.37	0.00	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	662	2040	852	1781	1870	1585	44	2198	961	945	1629	204
Grp Volume(v), veh/h	161	0	141	259	316	0	246	0	215	110	0	341
Grp Sat Flow(s),veh/h/ln	1837	0	1717	1781	1870	1585	1674	0	1529	945	0	1834
Q Serve(g_s), s	7.4	0.0	7.0	10.7	12.8	0.0	0.4	0.0	11.9	11.2	0.0	16.7
Cycle Q Clear(g_c), s	7.4	0.0	7.0	10.7	12.8	0.0	17.1	0.0	11.9	23.2	0.0	16.7
Prop In Lane	0.36		0.50	1.00		1.00	0.06		0.63	1.00		0.11
Lane Grp Cap(c), veh/h	412	0	385	658	691		488	0	410	213	0	492
V/C Ratio(X)	0.39	0.00	0.37	0.39	0.46		0.51	0.00	0.52	0.52	0.00	0.69
Avail Cap(c_a), veh/h	412	0	385	658	691		604	0	511	275	0	612
HCM 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
Upstream Filter(I)	1.00	0.00	1.00	0.91	0.91	0.00	0.97	0.00	0.97	0.99	0.00	0.99
Uniform Delay (d), s/veh	33.0	0.0	32.8	23.3	23.9	0.0	30.8	0.0	31.1	41.0	0.0	32.9
Incr Delay (d2), s/veh	2.8	0.0	2.7	0.3	0.4	0.0	0.8	0.0	1.0	1.9	0.0	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	3.2	4.5	5.6	0.0	5.1	0.0	4.5	2.7	0.0	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.8	0.0	35.5	23.6	24.3	0.0	31.6	0.0	32.1	42.9	0.0	35.3
LnGrp LOS	D	A	D	C	C		C	A	C	D	A	D
Approach Vol, veh/h		302			575	A		461			451	
Approach Delay, s/veh		35.6			24.0			31.9			37.2	
Approach LOS		D			C			C			D	

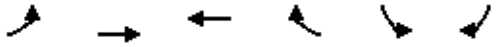
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		41.6		31.4		27.0		31.4				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		30.4		33.4		22.4		33.4				
Max Q Clear Time (g_c+I1), s		14.8		19.1		9.4		25.2				
Green Ext Time (p_c), s		2.4		2.4		1.4		1.7				

Intersection Summary	
HCM 6th Ctrl Delay	31.3
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.



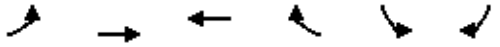
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	135	324	91	65	44
Future Volume (veh/h)	0	135	324	91	65	44
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	147	352	99	71	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2
Cap, veh/h	0	847	655	182	904	
Arrive On Green	0.00	0.24	0.24	0.24	0.51	0.00
Sat Flow, veh/h	0	3741	2841	762	1781	1585
Grp Volume(v), veh/h	0	147	226	225	71	0
Grp Sat Flow(s),veh/h/ln	0	1777	1777	1733	1781	1585
Q Serve(g_s), s	0.0	1.0	3.5	3.6	0.6	0.0
Cycle Q Clear(g_c), s	0.0	1.0	3.5	3.6	0.6	0.0
Prop In Lane	0.00			0.44	1.00	1.00
Lane Grp Cap(c), veh/h	0	847	424	413	904	
V/C Ratio(X)	0.00	0.17	0.53	0.54	0.08	
Avail Cap(c_a), veh/h	0	1804	902	880	904	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	9.5	10.5	10.5	4.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	1.0	1.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.3	1.1	1.1	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	9.6	11.5	11.6	4.1	0.0
LnGrp LOS	A	A	B	B	A	
Approach Vol, veh/h		147	451		71	A
Approach Delay, s/veh		9.6	11.6		4.1	
Approach LOS		A	B		A	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			11.5		20.0	11.5
Change Period (Y+Rc), s			4.0		4.0	4.0
Max Green Setting (Gmax), s			16.0		16.0	16.0
Max Q Clear Time (g_c+I1), s			3.0		2.6	5.6
Green Ext Time (p_c), s			0.6		0.1	2.0

Intersection Summary		
HCM 6th Ctrl Delay		10.4
HCM 6th LOS		B

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	378	358	122	293	185
Future Volume (veh/h)	0	378	358	122	293	185
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	411	389	133	318	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2
Cap, veh/h	0	931	683	231	877	
Arrive On Green	0.00	0.26	0.26	0.26	0.49	0.00
Sat Flow, veh/h	0	3741	2702	881	1781	1585
Grp Volume(v), veh/h	0	411	263	259	318	0
Grp Sat Flow(s),veh/h/ln	0	1777	1777	1712	1781	1585
Q Serve(g_s), s	0.0	3.1	4.2	4.3	3.6	0.0
Cycle Q Clear(g_c), s	0.0	3.1	4.2	4.3	3.6	0.0
Prop In Lane	0.00			0.51	1.00	1.00
Lane Grp Cap(c), veh/h	0	931	465	448	877	
V/C Ratio(X)	0.00	0.44	0.57	0.58	0.36	
Avail Cap(c_a), veh/h	0	1749	874	842	877	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	10.0	10.4	10.4	5.1	0.0
Incr Delay (d2), s/veh	0.0	0.3	1.1	1.2	1.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.9	1.3	1.3	0.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	10.3	11.5	11.6	6.3	0.0
LnGrp LOS	A	B	B	B	A	
Approach Vol, veh/h		411	522		318	A
Approach Delay, s/veh		10.3	11.5		6.3	
Approach LOS		B	B		A	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			12.5		20.0	12.5
Change Period (Y+Rc), s			4.0		4.0	4.0
Max Green Setting (Gmax), s			16.0		16.0	16.0
Max Q Clear Time (g_c+I1), s			5.1		5.6	6.3
Green Ext Time (p_c), s			2.0		0.7	2.2

Intersection Summary	
HCM 6th Ctrl Delay	9.8
HCM 6th LOS	A

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	32	8	17	281	323	62
Future Volume (vph)	32	8	17	281	323	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	4.2	5.6	5.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.97	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	1863	3338	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	1863	3338	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	9	18	305	351	67
RTOR Reduction (vph)	0	7	0	0	19	0
Lane Group Flow (vph)	35	2	18	305	399	0
Confl. Peds. (#/hr)	32	30				68
Confl. Bikes (#/hr)		5				16
Turn Type	Prot	Prot	Prot	NA	NA	
Protected Phases	4	4	5	2	6	
Permitted Phases						
Actuated Green, G (s)	21.0	21.0	18.0	56.0	34.0	
Effective Green, g (s)	19.8	19.8	17.8	54.4	32.4	
Actuated g/C Ratio	0.23	0.23	0.21	0.64	0.38	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	412	368	370	1192	1272	
v/s Ratio Prot	c0.02	0.00	0.01	c0.16	c0.12	
v/s Ratio Perm						
v/c Ratio	0.08	0.01	0.05	0.26	0.31	
Uniform Delay, d1	25.5	25.0	26.8	6.6	18.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.0	0.2	0.5	0.6	
Delay (s)	25.9	25.1	27.1	7.1	19.1	
Level of Service	C	C	C	A	B	
Approach Delay (s)	25.7			8.2	19.1	
Approach LOS	C			A	B	

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	37.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	85	20	24	339	544	141
Future Volume (vph)	85	20	24	339	544	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	4.2	5.6	5.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.96	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	1863	3283	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	1863	3283	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	22	26	368	591	153
RTOR Reduction (vph)	0	17	0	0	27	0
Lane Group Flow (vph)	92	5	26	368	717	0
Confl. Peds. (#/hr)	32	30				68
Confl. Bikes (#/hr)		5				16
Turn Type	Prot	Prot	Prot	NA	NA	
Protected Phases	4	4	5	2	6	
Permitted Phases						
Actuated Green, G (s)	19.0	19.0	18.0	58.0	36.0	
Effective Green, g (s)	17.8	17.8	17.8	56.4	34.4	
Actuated g/C Ratio	0.21	0.21	0.21	0.66	0.40	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	370	331	370	1236	1328	
v/s Ratio Prot	c0.05	0.00	0.01	c0.20	c0.22	
v/s Ratio Perm						
v/c Ratio	0.25	0.01	0.07	0.30	0.54	
Uniform Delay, d1	28.0	26.6	27.0	6.0	19.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.1	0.4	0.6	1.6	
Delay (s)	29.6	26.7	27.3	6.6	20.8	
Level of Service	C	C	C	A	C	
Approach Delay (s)	29.1			8.0	20.8	
Approach LOS	C			A	C	

Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	356	13	279	532	91	5	134	198	33	163	34
Future Volume (veh/h)	56	356	13	279	532	91	5	134	198	33	163	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.85	1.00		0.96	1.00		0.95	1.00		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683
Adj Flow Rate, veh/h	61	387	14	303	578	99	5	146	215	36	177	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	73	703	25	356	675	546	9	467	691	47	507	459
Arrive On Green	0.05	0.22	0.22	0.22	0.40	0.40	0.01	0.28	0.28	0.03	0.30	0.30
Sat Flow, veh/h	1603	3127	113	1603	1683	1363	1603	1683	1350	1603	1683	1307
Grp Volume(v), veh/h	61	197	204	303	578	99	5	146	215	36	177	37
Grp Sat Flow(s),veh/h/ln	1603	1599	1640	1603	1683	1363	1603	1683	1350	1603	1683	1307
Q Serve(g_s), s	2.4	7.1	7.1	11.8	20.3	3.0	0.2	4.5	6.2	1.4	5.3	1.2
Cycle Q Clear(g_c), s	2.4	7.1	7.1	11.8	20.3	3.0	0.2	4.5	6.2	1.4	5.3	1.2
Prop In Lane	1.00		0.07	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	73	359	369	356	675	546	9	467	691	47	507	459
V/C Ratio(X)	0.83	0.55	0.55	0.85	0.86	0.18	0.59	0.31	0.31	0.76	0.35	0.08
Avail Cap(c_a), veh/h	124	419	430	618	960	777	99	467	691	99	507	459
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.7	22.2	22.3	24.2	17.7	12.6	32.2	18.6	9.7	31.3	17.7	14.2
Incr Delay (d2), s/veh	20.5	1.3	1.3	5.8	5.5	0.2	50.9	1.7	1.2	22.0	1.9	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	2.6	2.7	4.7	8.0	0.9	0.2	1.8	1.8	0.8	2.2	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.2	23.5	23.6	30.0	23.3	12.7	83.2	20.3	10.8	53.3	19.6	14.6
LnGrp LOS	D	C	C	C	C	B	F	C	B	D	B	B
Approach Vol, veh/h		462			980			366			250	
Approach Delay, s/veh		27.2			24.3			15.6			23.7	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.9	22.0	18.4	18.6	4.3	23.6	7.0	30.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	18.0	25.0	17.0	4.0	18.0	5.0	37.0
Max Q Clear Time (g_c+I1), s	3.4	8.2	13.8	9.1	2.2	7.3	4.4	22.3
Green Ext Time (p_c), s	0.0	1.1	0.7	1.4	0.0	0.7	0.0	3.7

Intersection Summary	
HCM 6th Ctrl Delay	23.3
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	517	18	217	414	108	11	165	244	95	308	143
Future Volume (veh/h)	78	517	18	217	414	108	11	165	244	95	308	143
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.86	1.00		0.95	1.00		0.95	1.00		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683
Adj Flow Rate, veh/h	85	562	20	236	450	117	12	179	265	103	335	155
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	105	728	26	280	575	463	19	462	620	128	576	545
Arrive On Green	0.07	0.23	0.23	0.17	0.34	0.34	0.01	0.27	0.27	0.08	0.34	0.34
Sat Flow, veh/h	1603	3130	111	1603	1683	1355	1603	1683	1350	1603	1683	1318
Grp Volume(v), veh/h	85	287	295	236	450	117	12	179	265	103	335	155
Grp Sat Flow(s),veh/h/ln	1603	1599	1642	1603	1683	1355	1603	1683	1350	1603	1683	1318
Q Serve(g_s), s	3.5	11.3	11.3	9.6	16.1	4.2	0.5	5.8	9.0	4.2	11.0	5.3
Cycle Q Clear(g_c), s	3.5	11.3	11.3	9.6	16.1	4.2	0.5	5.8	9.0	4.2	11.0	5.3
Prop In Lane	1.00		0.07	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	105	372	382	280	575	463	19	462	620	128	576	545
V/C Ratio(X)	0.81	0.77	0.77	0.84	0.78	0.25	0.63	0.39	0.43	0.80	0.58	0.28
Avail Cap(c_a), veh/h	191	476	489	406	727	585	95	462	620	215	576	545
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.0	24.1	24.1	26.8	19.9	15.9	33.0	19.8	12.7	30.4	18.1	13.3
Incr Delay (d2), s/veh	13.4	5.8	5.8	10.3	4.3	0.3	29.1	2.4	2.2	11.0	4.2	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	4.6	4.7	4.3	6.5	1.2	0.3	2.4	2.8	2.0	4.6	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.3	29.9	29.9	37.1	24.2	16.2	62.1	22.2	14.8	41.4	22.4	14.6
LnGrp LOS	D	C	C	D	C	B	E	C	B	D	C	B
Approach Vol, veh/h		667			803			456			593	
Approach Delay, s/veh		31.7			26.8			19.0			23.6	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.4	22.4	15.7	19.6	4.8	27.0	8.4	26.9
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	9.0	18.0	17.0	20.0	4.0	23.0	8.0	29.0
Max Q Clear Time (g_c+I1), s	6.2	11.0	11.6	13.3	2.5	13.0	5.5	18.1
Green Ext Time (p_c), s	0.1	1.2	0.3	2.0	0.0	1.9	0.0	2.5

Intersection Summary	
HCM 6th Ctrl Delay	26.0
HCM 6th LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	50	41	44	206	176	23
Future Volume (veh/h)	50	41	44	206	176	23
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	45	48	224	191	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	72	60	962	1148	1943	251
Arrive On Green	0.08	0.08	0.61	0.61	0.61	0.61
Sat Flow, veh/h	912	760	1165	1870	3258	409
Grp Volume(v), veh/h	100	0	48	224	106	110
Grp Sat Flow(s),veh/h/ln	1688	0	1165	1870	1777	1797
Q Serve(g_s), s	1.5	0.0	0.5	1.4	0.6	0.7
Cycle Q Clear(g_c), s	1.5	0.0	1.1	1.4	0.6	0.7
Prop In Lane	0.54	0.45	1.00			0.23
Lane Grp Cap(c), veh/h	133	0	962	1148	1091	1103
V/C Ratio(X)	0.75	0.00	0.05	0.20	0.10	0.10
Avail Cap(c_a), veh/h	1036	0	962	1148	1091	1103
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.7	0.0	2.3	2.2	2.1	2.1
Incr Delay (d2), s/veh	8.1	0.0	0.1	0.4	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.1	0.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.9	0.0	2.4	2.6	2.2	2.2
LnGrp LOS	B	A	A	A	A	A
Approach Vol, veh/h	100			272	216	
Approach Delay, s/veh	19.9			2.6	2.2	
Approach LOS	B			A	A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		20.0		6.1		20.0
Change Period (Y+Rc), s		4.0		4.0		4.0
Max Green Setting (Gmax), s		16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s		3.4		3.5		2.7
Green Ext Time (p_c), s		1.1		0.2		0.9

Intersection Summary	
HCM 6th Ctrl Delay	5.4
HCM 6th LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	64	111	39	320	352	35
Future Volume (veh/h)	64	111	39	320	352	35
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	70	121	42	348	383	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	92	159	743	1056	1845	182
Arrive On Green	0.15	0.15	0.56	0.56	0.56	0.56
Sat Flow, veh/h	603	1042	966	1870	3360	322
Grp Volume(v), veh/h	192	0	42	348	207	214
Grp Sat Flow(s),veh/h/ln	1653	0	966	1870	1777	1812
Q Serve(g_s), s	3.2	0.0	0.6	2.8	1.6	1.6
Cycle Q Clear(g_c), s	3.2	0.0	2.3	2.8	1.6	1.6
Prop In Lane	0.36	0.63	1.00			0.18
Lane Grp Cap(c), veh/h	253	0	743	1056	1003	1023
V/C Ratio(X)	0.76	0.00	0.06	0.33	0.21	0.21
Avail Cap(c_a), veh/h	933	0	743	1056	1003	1023
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.5	0.0	3.6	3.3	3.0	3.0
Incr Delay (d2), s/veh	4.6	0.0	0.1	0.8	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.1	0.5	0.3	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	16.1	0.0	3.8	4.1	3.5	3.5
LnGrp LOS	B	A	A	A	A	A
Approach Vol, veh/h	192			390	421	
Approach Delay, s/veh	16.1			4.1	3.5	
Approach LOS	B			A	A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		20.0		8.3		20.0
Change Period (Y+Rc), s		4.0		4.0		4.0
Max Green Setting (Gmax), s		16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s		4.8		5.2		3.6
Green Ext Time (p_c), s		1.7		0.4		2.0

Intersection Summary	
HCM 6th Ctrl Delay	6.2
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	323	18	255	770	283	31	186	136	73	91	2
Future Volume (veh/h)	10	323	18	255	770	283	31	186	136	73	91	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	351	20	277	837	308	34	202	0	79	99	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	20	609	272	337	1242	554	50	1200		102	670	14
Arrive On Green	0.01	0.17	0.17	0.19	0.35	0.35	0.03	0.34	0.00	0.06	0.37	0.37
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	3554	1585	1781	1827	37
Grp Volume(v), veh/h	11	351	20	277	837	308	34	202	0	79	0	101
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1777	1585	1781	0	1864
Q Serve(g_s), s	0.4	5.9	0.7	9.8	13.1	10.3	1.2	2.6	0.0	2.9	0.0	2.4
Cycle Q Clear(g_c), s	0.4	5.9	0.7	9.8	13.1	10.3	1.2	2.6	0.0	2.9	0.0	2.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	20	609	272	337	1242	554	50	1200		102	0	684
V/C Ratio(X)	0.56	0.58	0.07	0.82	0.67	0.56	0.68	0.17		0.77	0.00	0.15
Avail Cap(c_a), veh/h	109	978	436	708	2172	969	163	1200		272	0	684
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.2	24.9	22.8	25.5	18.1	17.2	31.5	15.2	0.0	30.4	0.0	13.9
Incr Delay (d2), s/veh	22.3	0.9	0.1	5.0	0.6	0.9	14.8	0.3	0.0	11.7	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.4	0.3	4.4	5.0	3.5	0.7	1.0	0.0	1.5	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.5	25.8	22.9	30.5	18.8	18.1	46.3	15.5	0.0	42.1	0.0	14.3
LnGrp LOS	D	C	C	C	B	B	D	B		D	A	B
Approach Vol, veh/h		382			1422			236	A		180	
Approach Delay, s/veh		26.5			20.9			19.9			26.5	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	26.1	16.4	15.2	5.8	28.0	4.7	26.9
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	10.0	20.0	26.0	18.0	6.0	24.0	4.0	40.0
Max Q Clear Time (g_c+I1), s	4.9	4.6	11.8	7.9	3.2	4.4	2.4	15.1
Green Ext Time (p_c), s	0.1	1.0	0.7	1.6	0.0	0.4	0.0	7.7

Intersection Summary	
HCM 6th Ctrl Delay	22.2
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

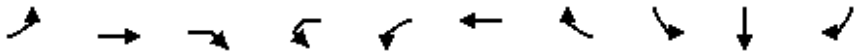
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	614	61	224	601	211	95	264	316	222	255	23
Future Volume (veh/h)	38	614	61	224	601	211	95	264	316	222	255	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	41	667	66	243	653	229	103	287	0	241	277	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	54	819	365	287	1284	573	133	865		285	556	50
Arrive On Green	0.03	0.23	0.23	0.16	0.36	0.36	0.07	0.24	0.00	0.16	0.33	0.33
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	3554	1585	1781	1690	153
Grp Volume(v), veh/h	41	667	66	243	653	229	103	287	0	241	0	302
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1777	1585	1781	0	1843
Q Serve(g_s), s	1.8	13.9	2.6	10.3	11.2	8.4	4.4	5.2	0.0	10.3	0.0	10.3
Cycle Q Clear(g_c), s	1.8	13.9	2.6	10.3	11.2	8.4	4.4	5.2	0.0	10.3	0.0	10.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	54	819	365	287	1284	573	133	865		285	0	606
V/C Ratio(X)	0.76	0.81	0.18	0.85	0.51	0.40	0.78	0.33		0.85	0.00	0.50
Avail Cap(c_a), veh/h	137	956	426	388	1457	650	251	865		388	0	606
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	37.6	28.4	24.1	31.8	19.5	18.6	35.5	24.3	0.0	31.8	0.0	21.0
Incr Delay (d2), s/veh	19.6	4.8	0.2	12.2	0.3	0.5	9.3	1.0	0.0	12.0	0.0	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	6.2	1.0	5.3	4.4	3.0	2.2	2.2	0.0	5.2	0.0	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.2	33.2	24.3	44.0	19.8	19.1	44.8	25.3	0.0	43.8	0.0	23.9
LnGrp LOS	E	C	C	D	B	B	D	C		D	A	C
Approach Vol, veh/h		774			1125			390	A		543	
Approach Delay, s/veh		33.8			24.9			30.5			32.8	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.5	23.0	16.6	22.0	9.8	29.7	6.4	32.2
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	17.0	19.0	17.0	21.0	11.0	25.0	6.0	32.0
Max Q Clear Time (g_c+I1), s	12.3	7.2	12.3	15.9	6.4	12.3	3.8	13.2
Green Ext Time (p_c), s	0.3	1.3	0.3	2.1	0.1	1.4	0.0	5.2

Intersection Summary	
HCM 6th Ctrl Delay	29.6
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	SBL2	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	88	348	65	0	126	658	1	9	51	119
Future Volume (vph)	88	348	65	0	126	658	1	9	51	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95			1.00	1.00
Frt	1.00	1.00	0.85		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)	1770	3539	1583		1770	3538			1849	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00			0.99	1.00
Satd. Flow (perm)	1770	3539	1583		1770	3538			1849	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	96	378	71	0	137	715	1	10	55	129
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	91
Lane Group Flow (vph)	96	378	71	0	137	716	0	0	65	38
Turn Type	Prot	NA	Perm	Prot	Prot	NA		Perm	NA	Perm
Protected Phases	7	4		3	3	8			6	
Permitted Phases			4					6		6
Actuated Green, G (s)	8.3	34.9	34.9		11.6	38.2			24.2	24.2
Effective Green, g (s)	8.3	34.9	34.9		11.6	38.2			24.2	24.2
Actuated g/C Ratio	0.10	0.42	0.42		0.14	0.46			0.29	0.29
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	177	1493	668		248	1634			541	463
v/s Ratio Prot	0.05	0.11			c0.08	c0.20				
v/s Ratio Perm			0.04						0.04	0.02
v/c Ratio	0.54	0.25	0.11		0.55	0.44			0.12	0.08
Uniform Delay, d1	35.4	15.5	14.5		33.1	15.0			21.4	21.2
Progression Factor	1.00	1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.4	0.1	0.1		2.7	0.9			0.5	0.3
Delay (s)	38.8	15.6	14.5		35.8	15.9			21.9	21.5
Level of Service	D	B	B		D	B			C	C
Approach Delay (s)		19.5				19.1			21.7	
Approach LOS		B				B			C	

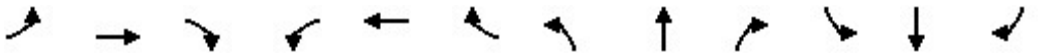
Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	82.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	36.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	SBL2	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	153	675	143	0	126	582	1	11	109	191
Future Volume (vph)	153	675	143	0	126	582	1	11	109	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95			1.00	1.00
Frt	1.00	1.00	0.85		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770	3539	1583		1770	3538			1854	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00			1.00	1.00
Satd. Flow (perm)	1770	3539	1583		1770	3538			1854	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	166	734	155	0	137	633	1	12	118	208
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	149
Lane Group Flow (vph)	166	734	155	0	137	634	0	0	130	59
Turn Type	Prot	NA	Perm	Prot	Prot	NA		Perm	NA	Perm
Protected Phases	7	4		3	3	8			6	
Permitted Phases			4					6		6
Actuated Green, G (s)	12.8	34.4	34.4		11.5	33.1			23.0	23.0
Effective Green, g (s)	12.8	34.4	34.4		11.5	33.1			23.0	23.0
Actuated g/C Ratio	0.16	0.43	0.43		0.14	0.41			0.28	0.28
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	280	1504	673		251	1447			527	450
v/s Ratio Prot	c0.09	c0.21			0.08	0.18				
v/s Ratio Perm			0.10						0.07	0.04
v/c Ratio	0.59	0.49	0.23		0.55	0.44			0.25	0.13
Uniform Delay, d1	31.6	16.9	14.8		32.3	17.2			22.3	21.5
Progression Factor	1.00	1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.3	0.3	0.2		2.4	1.0			1.1	0.6
Delay (s)	35.0	17.1	15.0		34.7	18.2			23.4	22.1
Level of Service	C	B	B		C	B			C	C
Approach Delay (s)		19.6				21.1			22.6	
Approach LOS		B				C			C	

Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	80.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	57	25	246	78	50	14	248	78	18	135	20
Future Volume (veh/h)	25	57	25	246	78	50	14	248	78	18	135	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	27	62	27	176	212	0	15	270	85	20	147	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	197	462	206	828	869		48	375	117	120	243	36
Arrive On Green	0.24	0.24	0.24	0.46	0.46	0.00	0.15	0.15	0.15	0.15	0.15	0.15
Sat Flow, veh/h	808	1894	846	1781	1870	1585	60	2448	764	1026	1590	238
Grp Volume(v), veh/h	61	0	55	176	212	0	196	0	174	20	0	169
Grp Sat Flow(s),veh/h/ln	1830	0	1718	1781	1870	1585	1708	0	1565	1026	0	1828
Q Serve(g_s), s	2.6	0.0	2.5	5.9	6.8	0.0	2.6	0.0	10.6	1.9	0.0	8.6
Cycle Q Clear(g_c), s	2.6	0.0	2.5	5.9	6.8	0.0	11.2	0.0	10.6	12.5	0.0	8.6
Prop In Lane	0.44		0.49	1.00		1.00	0.08		0.49	1.00		0.13
Lane Grp Cap(c), veh/h	447	0	419	828	869		300	0	240	120	0	280
V/C Ratio(X)	0.14	0.00	0.13	0.21	0.24		0.65	0.00	0.73	0.17	0.00	0.60
Avail Cap(c_a), veh/h	447	0	419	828	869		553	0	460	265	0	537
HCM 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
Upstream Filter(I)	1.00	0.00	1.00	0.91	0.91	0.00	0.98	0.00	0.98	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.6	0.0	29.5	15.9	16.1	0.0	40.3	0.0	40.3	46.3	0.0	39.5
Incr Delay (d2), s/veh	0.6	0.0	0.6	0.1	0.1	0.0	2.3	0.0	4.1	0.6	0.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	1.1	2.4	2.9	0.0	4.8	0.0	4.3	0.5	0.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.2	0.0	30.2	16.0	16.3	0.0	42.7	0.0	44.4	46.9	0.0	41.6
LnGrp LOS	C	A	C	B	B		D	A	D	D	A	D
Approach Vol, veh/h		116			388	A		370			189	
Approach Delay, s/veh		30.2			16.2			43.5			42.2	
Approach LOS		C			B			D			D	

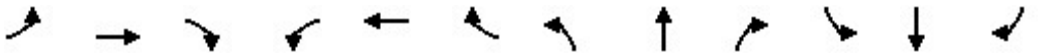
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		51.1		19.9		29.0		19.9				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		32.4		29.4		24.4		29.4				
Max Q Clear Time (g_c+I1), s		8.8		13.2		4.6		14.5				
Green Ext Time (p_c), s		1.7		2.0		0.5		0.8				

Intersection Summary												
HCM 6th Ctrl Delay			31.8									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	160	67	385	107	49	17	292	128	101	282	35
Future Volume (veh/h)	53	160	67	385	107	49	17	292	128	101	282	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	58	174	73	267	327	0	18	317	139	110	307	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	147	452	197	651	683		52	588	262	212	445	55
Arrive On Green	0.22	0.22	0.22	0.37	0.37	0.00	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	656	2017	878	1781	1870	1585	48	2154	960	935	1632	202
Grp Volume(v), veh/h	163	0	142	267	327	0	253	0	221	110	0	345
Grp Sat Flow(s),veh/h/ln	1838	0	1712	1781	1870	1585	1633	0	1529	935	0	1834
Q Serve(g_s), s	7.5	0.0	7.0	11.2	13.4	0.0	0.5	0.0	12.3	11.3	0.0	16.8
Cycle Q Clear(g_c), s	7.5	0.0	7.0	11.2	13.4	0.0	17.3	0.0	12.3	23.6	0.0	16.8
Prop In Lane	0.36		0.51	1.00		1.00	0.07		0.63	1.00		0.11
Lane Grp Cap(c), veh/h	412	0	384	651	683		484	0	417	212	0	500
V/C Ratio(X)	0.40	0.00	0.37	0.41	0.48		0.52	0.00	0.53	0.52	0.00	0.69
Avail Cap(c_a), veh/h	412	0	384	651	683		592	0	511	269	0	613
HCM 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
Upstream Filter(I)	1.00	0.00	1.00	0.91	0.91	0.00	0.97	0.00	0.97	0.99	0.00	0.99
Uniform Delay (d), s/veh	33.0	0.0	32.8	23.7	24.4	0.0	30.6	0.0	30.9	41.0	0.0	32.6
Incr Delay (d2), s/veh	2.8	0.0	2.7	0.4	0.5	0.0	0.8	0.0	1.0	1.9	0.0	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	0.0	3.2	4.7	5.9	0.0	5.2	0.0	4.6	2.7	0.0	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.9	0.0	35.6	24.1	24.9	0.0	31.5	0.0	31.9	42.9	0.0	35.0
LnGrp LOS	D	A	D	C	C		C	A	C	D	A	D
Approach Vol, veh/h		305			594	A		474			455	
Approach Delay, s/veh		35.7			24.5			31.7			36.9	
Approach LOS		D			C			C			D	

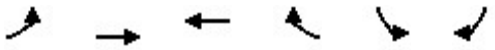
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		41.1		31.9		27.0		31.9				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		30.4		33.4		22.4		33.4				
Max Q Clear Time (g_c+I1), s		15.4		19.3		9.5		25.6				
Green Ext Time (p_c), s		2.5		2.5		1.4		1.6				

Intersection Summary		
HCM 6th Ctrl Delay		31.3
HCM 6th LOS		C

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.



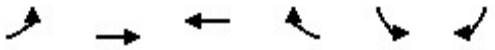
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	147	328	91	65	49
Future Volume (veh/h)	0	147	328	91	65	49
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	160	357	99	71	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2
Cap, veh/h	0	853	662	181	903	
Arrive On Green	0.00	0.24	0.24	0.24	0.51	0.00
Sat Flow, veh/h	0	3741	2850	754	1781	1585
Grp Volume(v), veh/h	0	160	228	228	71	0
Grp Sat Flow(s),veh/h/ln	0	1777	1777	1735	1781	1585
Q Serve(g_s), s	0.0	1.1	3.5	3.6	0.6	0.0
Cycle Q Clear(g_c), s	0.0	1.1	3.5	3.6	0.6	0.0
Prop In Lane	0.00			0.43	1.00	1.00
Lane Grp Cap(c), veh/h	0	853	426	416	903	
V/C Ratio(X)	0.00	0.19	0.54	0.55	0.08	
Avail Cap(c_a), veh/h	0	1800	900	879	903	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	9.5	10.5	10.5	4.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	1.0	1.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.3	1.1	1.1	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	9.7	11.5	11.6	4.2	0.0
LnGrp LOS	A	A	B	B	A	
Approach Vol, veh/h		160	456		71	A
Approach Delay, s/veh		9.7	11.6		4.2	
Approach LOS		A	B		A	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			11.6		20.0	11.6
Change Period (Y+Rc), s			4.0		4.0	4.0
Max Green Setting (Gmax), s			16.0		16.0	16.0
Max Q Clear Time (g_c+I1), s			3.1		2.6	5.6
Green Ext Time (p_c), s			0.7		0.1	2.0

Intersection Summary		
HCM 6th Ctrl Delay		10.4
HCM 6th LOS		B

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	382	365	122	293	193
Future Volume (veh/h)	0	382	365	122	293	193
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	415	397	133	318	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2
Cap, veh/h	0	939	693	229	874	
Arrive On Green	0.00	0.26	0.26	0.26	0.49	0.00
Sat Flow, veh/h	0	3741	2716	868	1781	1585
Grp Volume(v), veh/h	0	415	267	263	318	0
Grp Sat Flow(s),veh/h/ln	0	1777	1777	1714	1781	1585
Q Serve(g_s), s	0.0	3.2	4.3	4.3	3.6	0.0
Cycle Q Clear(g_c), s	0.0	3.2	4.3	4.3	3.6	0.0
Prop In Lane	0.00			0.51	1.00	1.00
Lane Grp Cap(c), veh/h	0	939	469	453	874	
V/C Ratio(X)	0.00	0.44	0.57	0.58	0.36	
Avail Cap(c_a), veh/h	0	1743	872	841	874	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	10.0	10.4	10.4	5.2	0.0
Incr Delay (d2), s/veh	0.0	0.3	1.1	1.2	1.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.9	1.3	1.3	1.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	10.3	11.5	11.6	6.3	0.0
LnGrp LOS	A	B	B	B	A	
Approach Vol, veh/h		415	530		318	A
Approach Delay, s/veh		10.3	11.5		6.3	
Approach LOS		B	B		A	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			12.6		20.0	12.6
Change Period (Y+Rc), s			4.0		4.0	4.0
Max Green Setting (Gmax), s			16.0		16.0	16.0
Max Q Clear Time (g_c+I1), s			5.2		5.6	6.3
Green Ext Time (p_c), s			2.0		0.7	2.3

Intersection Summary	
HCM 6th Ctrl Delay	9.8
HCM 6th LOS	A

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	32	8	17	285	335	62
Future Volume (vph)	32	8	17	285	335	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	4.2	5.6	5.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.97	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	1863	3344	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	1863	3344	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	9	18	310	364	67
RTOR Reduction (vph)	0	7	0	0	18	0
Lane Group Flow (vph)	35	2	18	310	413	0
Confl. Peds. (#/hr)	32	30				68
Confl. Bikes (#/hr)		5				16
Turn Type	Prot	Prot	Prot	NA	NA	
Protected Phases	4	4	5	2	6	
Permitted Phases						
Actuated Green, G (s)	21.0	21.0	18.0	56.0	34.0	
Effective Green, g (s)	19.8	19.8	17.8	54.4	32.4	
Actuated g/C Ratio	0.23	0.23	0.21	0.64	0.38	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	412	368	370	1192	1274	
v/s Ratio Prot	c0.02	0.00	0.01	c0.17	c0.12	
v/s Ratio Perm						
v/c Ratio	0.08	0.01	0.05	0.26	0.32	
Uniform Delay, d1	25.5	25.0	26.8	6.6	18.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.0	0.2	0.5	0.7	
Delay (s)	25.9	25.1	27.1	7.1	19.2	
Level of Service	C	C	C	A	B	
Approach Delay (s)	25.7			8.2	19.2	
Approach LOS	C			A	B	

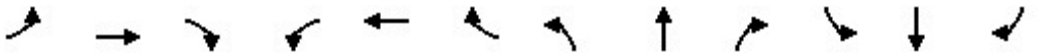
Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	37.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	85	20	24	346	546	141
Future Volume (vph)	85	20	24	346	546	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	4.2	5.6	5.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.96	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	1863	3283	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	1863	3283	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	22	26	376	593	153
RTOR Reduction (vph)	0	17	0	0	27	0
Lane Group Flow (vph)	92	5	26	376	719	0
Confl. Peds. (#/hr)	32	30				68
Confl. Bikes (#/hr)		5				16
Turn Type	Prot	Prot	Prot	NA	NA	
Protected Phases	4	4	5	2	6	
Permitted Phases						
Actuated Green, G (s)	19.0	19.0	18.0	58.0	36.0	
Effective Green, g (s)	17.8	17.8	17.8	56.4	34.4	
Actuated g/C Ratio	0.21	0.21	0.21	0.66	0.40	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	370	331	370	1236	1328	
v/s Ratio Prot	c0.05	0.00	0.01	c0.20	c0.22	
v/s Ratio Perm						
v/c Ratio	0.25	0.01	0.07	0.30	0.54	
Uniform Delay, d1	28.0	26.6	27.0	6.0	19.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.1	0.4	0.6	1.6	
Delay (s)	29.6	26.7	27.3	6.7	20.9	
Level of Service	C	C	C	A	C	
Approach Delay (s)	29.1			8.0	20.9	
Approach LOS	C			A	C	

Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		

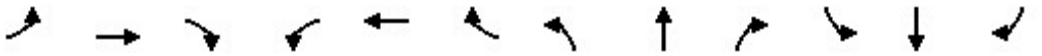
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	356	13	279	532	93	5	135	198	38	165	39
Future Volume (veh/h)	58	356	13	279	532	93	5	135	198	38	165	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.85	1.00		0.96	1.00		0.95	1.00		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683
Adj Flow Rate, veh/h	63	387	14	303	578	101	5	147	215	41	179	42
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	76	707	25	355	674	546	9	463	688	52	509	463
Arrive On Green	0.05	0.23	0.23	0.22	0.40	0.40	0.01	0.28	0.28	0.03	0.30	0.30
Sat Flow, veh/h	1603	3127	113	1603	1683	1363	1603	1683	1350	1603	1683	1307
Grp Volume(v), veh/h	63	197	204	303	578	101	5	147	215	41	179	42
Grp Sat Flow(s),veh/h/ln	1603	1599	1640	1603	1683	1363	1603	1683	1350	1603	1683	1307
Q Serve(g_s), s	2.5	7.1	7.2	11.9	20.5	3.1	0.2	4.5	6.2	1.7	5.4	1.4
Cycle Q Clear(g_c), s	2.5	7.1	7.2	11.9	20.5	3.1	0.2	4.5	6.2	1.7	5.4	1.4
Prop In Lane	1.00		0.07	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	76	362	371	355	674	546	9	463	688	52	509	463
V/C Ratio(X)	0.83	0.54	0.55	0.85	0.86	0.19	0.59	0.32	0.31	0.80	0.35	0.09
Avail Cap(c_a), veh/h	123	416	427	613	953	771	98	463	688	98	509	463
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.9	22.3	22.4	24.4	17.9	12.7	32.4	18.8	9.8	31.4	17.8	14.3
Incr Delay (d2), s/veh	21.3	1.3	1.3	5.8	5.7	0.2	51.0	1.8	1.2	23.5	1.9	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	2.6	2.7	4.8	8.1	0.9	0.2	1.9	1.8	1.0	2.2	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.2	23.6	23.6	30.2	23.6	12.9	83.4	20.6	11.0	54.9	19.7	14.7
LnGrp LOS	D	C	C	C	C	B	F	C	B	D	B	B
Approach Vol, veh/h		464			982			367			262	
Approach Delay, s/veh		27.5			24.5			15.8			24.4	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.1	22.0	18.5	18.8	4.3	23.8	7.1	30.2
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	18.0	25.0	17.0	4.0	18.0	5.0	37.0
Max Q Clear Time (g_c+I1), s	3.7	8.2	13.9	9.2	2.2	7.4	4.5	22.5
Green Ext Time (p_c), s	0.0	1.1	0.7	1.4	0.0	0.8	0.0	3.7

Intersection Summary	
HCM 6th Ctrl Delay	23.6
HCM 6th LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	517	18	217	414	111	11	166	244	97	309	145
Future Volume (veh/h)	81	517	18	217	414	111	11	166	244	97	309	145
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.85	1.00		0.95	1.00		0.95	1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683
Adj Flow Rate, veh/h	88	562	20	236	450	121	12	180	265	105	336	158
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	109	701	25	279	556	447	19	497	648	131	615	580
Arrive On Green	0.07	0.22	0.22	0.17	0.33	0.33	0.01	0.30	0.30	0.08	0.37	0.37
Sat Flow, veh/h	1603	3129	111	1603	1683	1353	1603	1683	1354	1603	1683	1323
Grp Volume(v), veh/h	88	287	295	236	450	121	12	180	265	105	336	158
Grp Sat Flow(s),veh/h/ln	1603	1599	1641	1603	1683	1353	1603	1683	1354	1603	1683	1323
Q Serve(g_s), s	3.9	12.1	12.1	10.1	17.4	4.7	0.5	6.0	9.2	4.6	11.3	5.5
Cycle Q Clear(g_c), s	3.9	12.1	12.1	10.1	17.4	4.7	0.5	6.0	9.2	4.6	11.3	5.5
Prop In Lane	1.00		0.07	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	109	358	368	279	556	447	19	497	648	131	615	580
V/C Ratio(X)	0.81	0.80	0.80	0.84	0.81	0.27	0.63	0.36	0.41	0.80	0.55	0.27
Avail Cap(c_a), veh/h	180	449	461	428	733	589	90	497	648	225	615	580
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	26.1	26.1	28.5	21.8	17.5	35.0	19.8	12.5	32.1	17.9	13.0
Incr Delay (d2), s/veh	12.8	8.0	8.0	9.2	5.1	0.3	29.6	2.0	1.9	10.7	3.5	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	5.2	5.3	4.4	7.2	1.4	0.4	2.5	2.8	2.1	4.7	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.5	34.1	34.2	37.7	26.9	17.9	64.6	21.8	14.4	42.9	21.4	14.1
LnGrp LOS	D	C	C	D	C	B	E	C	B	D	C	B
Approach Vol, veh/h		670			807			457			599	
Approach Delay, s/veh		35.6			28.7			18.6			23.2	
Approach LOS		D			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.8	25.0	16.4	20.0	4.8	30.0	8.9	27.5
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	10.0	20.0	19.0	20.0	4.0	26.0	8.0	31.0
Max Q Clear Time (g_c+I1), s	6.6	11.2	12.1	14.1	2.5	13.3	5.9	19.4
Green Ext Time (p_c), s	0.1	1.4	0.4	1.8	0.0	2.1	0.0	2.6

Intersection Summary	
HCM 6th Ctrl Delay	27.4
HCM 6th LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	50	41	44	224	178	23
Future Volume (veh/h)	50	41	44	224	178	23
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	45	48	243	193	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	72	60	961	1148	1946	249
Arrive On Green	0.08	0.08	0.61	0.61	0.61	0.61
Sat Flow, veh/h	912	760	1163	1870	3263	405
Grp Volume(v), veh/h	100	0	48	243	107	111
Grp Sat Flow(s),veh/h/ln	1688	0	1163	1870	1777	1797
Q Serve(g_s), s	1.5	0.0	0.5	1.5	0.6	0.7
Cycle Q Clear(g_c), s	1.5	0.0	1.1	1.5	0.6	0.7
Prop In Lane	0.54	0.45	1.00			0.23
Lane Grp Cap(c), veh/h	133	0	961	1148	1091	1104
V/C Ratio(X)	0.75	0.00	0.05	0.21	0.10	0.10
Avail Cap(c_a), veh/h	1036	0	961	1148	1091	1104
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.7	0.0	2.3	2.2	2.1	2.1
Incr Delay (d2), s/veh	8.1	0.0	0.1	0.4	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.1	0.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.9	0.0	2.4	2.7	2.2	2.3
LnGrp LOS	B	A	A	A	A	A
Approach Vol, veh/h	100			291	218	
Approach Delay, s/veh	19.9			2.6	2.2	
Approach LOS	B			A	A	

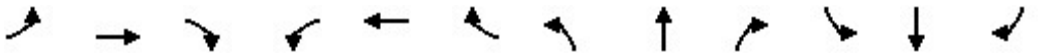
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		20.0		6.1		20.0
Change Period (Y+Rc), s		4.0		4.0		4.0
Max Green Setting (Gmax), s		16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s		3.5		3.5		2.7
Green Ext Time (p_c), s		1.2		0.2		0.9

Intersection Summary	
HCM 6th Ctrl Delay	5.3
HCM 6th LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	64	111	39	327	355	35
Future Volume (veh/h)	64	111	39	327	355	35
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	70	121	42	355	386	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	92	159	741	1056	1846	181
Arrive On Green	0.15	0.15	0.56	0.56	0.56	0.56
Sat Flow, veh/h	603	1042	963	1870	3363	320
Grp Volume(v), veh/h	192	0	42	355	209	215
Grp Sat Flow(s),veh/h/ln	1653	0	963	1870	1777	1813
Q Serve(g_s), s	3.2	0.0	0.6	2.9	1.6	1.7
Cycle Q Clear(g_c), s	3.2	0.0	2.3	2.9	1.6	1.7
Prop In Lane	0.36	0.63	1.00			0.18
Lane Grp Cap(c), veh/h	253	0	741	1056	1003	1024
V/C Ratio(X)	0.76	0.00	0.06	0.34	0.21	0.21
Avail Cap(c_a), veh/h	933	0	741	1056	1003	1024
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.5	0.0	3.6	3.3	3.0	3.0
Incr Delay (d2), s/veh	4.6	0.0	0.1	0.9	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.1	0.5	0.3	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	16.1	0.0	3.8	4.2	3.5	3.5
LnGrp LOS	B	A	A	A	A	A
Approach Vol, veh/h	192			397	424	
Approach Delay, s/veh	16.1			4.1	3.5	
Approach LOS	B			A	A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		20.0		8.3		20.0
Change Period (Y+Rc), s		4.0		4.0		4.0
Max Green Setting (Gmax), s		16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s		4.9		5.2		3.7
Green Ext Time (p_c), s		1.8		0.4		2.0

Intersection Summary	
HCM 6th Ctrl Delay	6.1
HCM 6th LOS	A



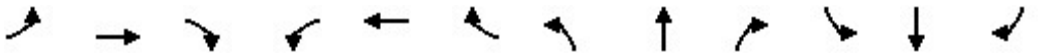
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	323	18	257	770	283	33	198	141	73	95	2
Future Volume (veh/h)	10	323	18	257	770	283	33	198	141	73	95	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	351	20	279	837	308	36	215	0	79	103	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	20	604	269	339	1241	554	52	1202		102	670	13
Arrive On Green	0.01	0.17	0.17	0.19	0.35	0.35	0.03	0.34	0.00	0.06	0.37	0.37
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	3554	1585	1781	1828	36
Grp Volume(v), veh/h	11	351	20	279	837	308	36	215	0	79	0	105
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1777	1585	1781	0	1864
Q Serve(g_s), s	0.4	6.0	0.7	9.9	13.1	10.3	1.3	2.8	0.0	2.9	0.0	2.5
Cycle Q Clear(g_c), s	0.4	6.0	0.7	9.9	13.1	10.3	1.3	2.8	0.0	2.9	0.0	2.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	20	604	269	339	1241	554	52	1202		102	0	683
V/C Ratio(X)	0.56	0.58	0.07	0.82	0.67	0.56	0.69	0.18		0.77	0.00	0.15
Avail Cap(c_a), veh/h	109	976	435	707	2169	967	163	1202		272	0	683
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.2	25.0	22.9	25.5	18.2	17.2	31.5	15.3	0.0	30.5	0.0	13.9
Incr Delay (d2), s/veh	22.3	0.9	0.1	5.0	0.6	0.9	14.9	0.3	0.0	11.7	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.5	0.3	4.4	5.0	3.5	0.8	1.1	0.0	1.5	0.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.6	25.9	23.0	30.5	18.8	18.1	46.4	15.6	0.0	42.1	0.0	14.4
LnGrp LOS	D	C	C	C	B	B	D	B		D	A	B
Approach Vol, veh/h		382			1424			251	A		184	
Approach Delay, s/veh		26.6			20.9			20.0			26.3	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	26.2	16.5	15.1	5.9	28.0	4.7	26.9
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	10.0	20.0	26.0	18.0	6.0	24.0	4.0	40.0
Max Q Clear Time (g_c+I1), s	4.9	4.8	11.9	8.0	3.3	4.5	2.4	15.1
Green Ext Time (p_c), s	0.1	1.1	0.7	1.6	0.0	0.4	0.0	7.7

Intersection Summary	
HCM 6th Ctrl Delay	22.2
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



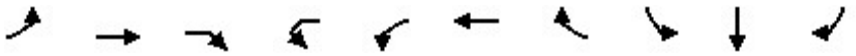
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	614	61	227	601	211	96	268	318	222	262	23
Future Volume (veh/h)	38	614	61	227	601	211	96	268	318	222	262	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	41	667	66	247	653	229	104	291	0	241	285	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	54	818	365	291	1291	576	134	862		285	555	49
Arrive On Green	0.03	0.23	0.23	0.16	0.36	0.36	0.08	0.24	0.00	0.16	0.33	0.33
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	3554	1585	1781	1695	149
Grp Volume(v), veh/h	41	667	66	247	653	229	104	291	0	241	0	310
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1777	1585	1781	0	1844
Q Serve(g_s), s	1.8	13.9	2.6	10.6	11.2	8.4	4.5	5.3	0.0	10.3	0.0	10.7
Cycle Q Clear(g_c), s	1.8	13.9	2.6	10.6	11.2	8.4	4.5	5.3	0.0	10.3	0.0	10.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	54	818	365	291	1291	576	134	862		285	0	603
V/C Ratio(X)	0.76	0.82	0.18	0.85	0.51	0.40	0.78	0.34		0.85	0.00	0.51
Avail Cap(c_a), veh/h	136	953	425	387	1452	647	250	862		387	0	603
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	37.7	28.6	24.2	31.8	19.5	18.6	35.6	24.5	0.0	32.0	0.0	21.3
Incr Delay (d2), s/veh	19.7	4.9	0.2	12.8	0.3	0.4	9.2	1.1	0.0	12.1	0.0	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	6.3	1.0	5.4	4.4	3.0	2.2	2.3	0.0	5.2	0.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.5	33.5	24.5	44.6	19.8	19.0	44.8	25.5	0.0	44.1	0.0	24.4
LnGrp LOS	E	C	C	D	B	B	D	C		D	A	C
Approach Vol, veh/h		774			1129			395	A		551	
Approach Delay, s/veh		34.0			25.0			30.6			33.0	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.5	23.0	16.8	22.0	9.9	29.6	6.4	32.5
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	17.0	19.0	17.0	21.0	11.0	25.0	6.0	32.0
Max Q Clear Time (g_c+I1), s	12.3	7.3	12.6	15.9	6.5	12.7	3.8	13.2
Green Ext Time (p_c), s	0.3	1.4	0.3	2.1	0.1	1.4	0.0	5.2

Intersection Summary	
HCM 6th Ctrl Delay	29.8
HCM 6th LOS	C

Notes

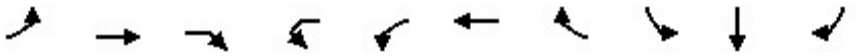
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	SBL2	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	88	348	66	0	126	660	1	9	51	119
Future Volume (vph)	88	348	66	0	126	660	1	9	51	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95			1.00	1.00
Frt	1.00	1.00	0.85		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)	1770	3539	1583		1770	3538			1849	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00			0.99	1.00
Satd. Flow (perm)	1770	3539	1583		1770	3538			1849	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	96	378	72	0	137	717	1	10	55	129
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	91
Lane Group Flow (vph)	96	378	72	0	137	718	0	0	65	38
Turn Type	Prot	NA	Perm	Prot	Prot	NA		Perm	NA	Perm
Protected Phases	7	4		3	3	8			6	
Permitted Phases			4					6		6
Actuated Green, G (s)	8.3	34.9	34.9		11.6	38.2			24.2	24.2
Effective Green, g (s)	8.3	34.9	34.9		11.6	38.2			24.2	24.2
Actuated g/C Ratio	0.10	0.42	0.42		0.14	0.46			0.29	0.29
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	177	1493	668		248	1634			541	463
v/s Ratio Prot	0.05	0.11			c0.08	c0.20				
v/s Ratio Perm			0.05						0.04	0.02
v/c Ratio	0.54	0.25	0.11		0.55	0.44			0.12	0.08
Uniform Delay, d1	35.4	15.5	14.5		33.1	15.0			21.4	21.2
Progression Factor	1.00	1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.4	0.1	0.1		2.7	0.9			0.5	0.3
Delay (s)	38.8	15.6	14.5		35.8	15.9			21.9	21.5
Level of Service	D	B	B		D	B			C	C
Approach Delay (s)		19.5				19.1			21.7	
Approach LOS		B				B			C	

Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	82.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	36.5%	ICU Level of Service	A
Analysis Period (min)	15		

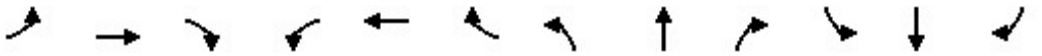
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	SBL2	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	153	675	144	0	126	583	1	11	109	191
Future Volume (vph)	153	675	144	0	126	583	1	11	109	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95			1.00	1.00
Frt	1.00	1.00	0.85		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770	3539	1583		1770	3538			1854	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00			1.00	1.00
Satd. Flow (perm)	1770	3539	1583		1770	3538			1854	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	166	734	157	0	137	634	1	12	118	208
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	149
Lane Group Flow (vph)	166	734	157	0	137	635	0	0	130	59
Turn Type	Prot	NA	Perm	Prot	Prot	NA		Perm	NA	Perm
Protected Phases	7	4		3	3	8			6	
Permitted Phases			4					6		6
Actuated Green, G (s)	12.8	34.4	34.4		11.5	33.1			23.0	23.0
Effective Green, g (s)	12.8	34.4	34.4		11.5	33.1			23.0	23.0
Actuated g/C Ratio	0.16	0.43	0.43		0.14	0.41			0.28	0.28
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	280	1504	673		251	1447			527	450
v/s Ratio Prot	c0.09	c0.21			0.08	0.18				
v/s Ratio Perm			0.10						0.07	0.04
v/c Ratio	0.59	0.49	0.23		0.55	0.44			0.25	0.13
Uniform Delay, d1	31.6	16.9	14.8		32.3	17.2			22.3	21.5
Progression Factor	1.00	1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.3	0.3	0.2		2.4	1.0			1.1	0.6
Delay (s)	35.0	17.1	15.0		34.7	18.2			23.4	22.1
Level of Service	C	B	B		C	B			C	C
Approach Delay (s)		19.6				21.1			22.6	
Approach LOS		B				C			C	

Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	80.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	262	44	496	314	79	46	523	243	193	649	75
Future Volume (veh/h)	70	262	44	496	314	79	46	523	243	193	649	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	76	285	48	440	480	0	50	568	264	210	705	82
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	100	393	69	445	468		49	625	457	245	789	92
Arrive On Green	0.16	0.16	0.16	0.25	0.25	0.00	0.48	0.48	0.48	0.48	0.48	0.48
Sat Flow, veh/h	647	2536	445	1781	1870	1585	32	1301	951	660	1645	191
Grp Volume(v), veh/h	216	0	193	440	480	0	457	0	425	210	0	787
Grp Sat Flow(s),veh/h/ln	1838	0	1790	1781	1870	1585	754	0	1531	660	0	1836
Q Serve(g_s), s	13.5	0.0	12.3	29.5	30.0	0.0	10.8	0.0	24.0	33.6	0.0	46.8
Cycle Q Clear(g_c), s	13.5	0.0	12.3	29.5	30.0	0.0	57.6	0.0	24.0	57.6	0.0	46.8
Prop In Lane	0.35		0.25	1.00		1.00	0.11		0.62	1.00		0.10
Lane Grp Cap(c), veh/h	285	0	277	445	468		395	0	735	245	0	881
V/C Ratio(X)	0.76	0.00	0.70	0.99	1.03		1.16	0.00	0.58	0.86	0.00	0.89
Avail Cap(c_a), veh/h	285	0	277	445	468		395	0	735	245	0	881
HCM 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
Upstream Filter(I)	1.00	0.00	1.00	0.77	0.77	0.00	0.87	0.00	0.87	0.88	0.00	0.88
Uniform Delay (d), s/veh	48.5	0.0	48.0	44.8	45.0	0.0	29.9	0.0	22.5	45.2	0.0	28.4
Incr Delay (d2), s/veh	17.1	0.0	13.5	34.3	43.5	0.0	92.8	0.0	1.0	22.4	0.0	10.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	0.0	6.5	17.2	19.4	0.0	17.4	0.0	8.7	7.9	0.0	22.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.6	0.0	61.5	79.1	88.5	0.0	122.7	0.0	23.4	67.6	0.0	38.7
LnGrp LOS	E	A	E	E	F		F	A	C	E	A	D
Approach Vol, veh/h		409			920	A		882			997	
Approach Delay, s/veh		63.7			84.0			74.9			44.8	
Approach LOS		E			F			E			D	

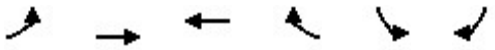
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		34.6		62.2		23.2		62.2				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		30.0		57.6		18.6		57.6				
Max Q Clear Time (g_c+I1), s		32.0		59.6		15.5		59.6				
Green Ext Time (p_c), s		0.0		0.0		0.7		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			66.7									
HCM 6th LOS			E									

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	602	620	178	445	161
Future Volume (veh/h)	0	602	620	178	445	161
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	654	674	193	484	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2
Cap, veh/h	0	1230	944	270	776	
Arrive On Green	0.00	0.35	0.35	0.35	0.44	0.00
Sat Flow, veh/h	0	3741	2820	780	1781	1585
Grp Volume(v), veh/h	0	654	439	428	484	0
Grp Sat Flow(s),veh/h/ln	0	1777	1777	1730	1781	1585
Q Serve(g_s), s	0.0	5.4	7.9	7.9	7.7	0.0
Cycle Q Clear(g_c), s	0.0	5.4	7.9	7.9	7.7	0.0
Prop In Lane	0.00			0.45	1.00	1.00
Lane Grp Cap(c), veh/h	0	1230	615	599	776	
V/C Ratio(X)	0.00	0.53	0.71	0.71	0.62	
Avail Cap(c_a), veh/h	0	1549	774	754	776	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	9.6	10.4	10.4	8.0	0.0
Incr Delay (d2), s/veh	0.0	0.4	2.3	2.4	3.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.6	2.6	2.5	2.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	10.0	12.7	12.8	11.8	0.0
LnGrp LOS	A	A	B	B	B	
Approach Vol, veh/h		654	867		484	A
Approach Delay, s/veh		10.0	12.8		11.8	
Approach LOS		A	B		B	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			16.7		20.0	16.7
Change Period (Y+Rc), s			4.0		4.0	4.0
Max Green Setting (Gmax), s			16.0		16.0	16.0
Max Q Clear Time (g_c+I1), s			7.4		9.7	9.9
Green Ext Time (p_c), s			2.9		0.9	2.8

Intersection Summary		
HCM 6th Ctrl Delay	11.6	
HCM 6th LOS	B	

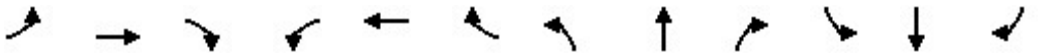
Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	193	111	116	569	805	317
Future Volume (vph)	193	111	116	569	805	317
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	4.2	5.6	5.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.90	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	1863	3064	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	1863	3064	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	210	121	126	618	875	345
RTOR Reduction (vph)	0	95	0	0	28	0
Lane Group Flow (vph)	210	26	126	618	1192	0
Confl. Peds. (#/hr)	32	30				68
Confl. Bikes (#/hr)		5				16
Turn Type	Prot	Prot	Prot	NA	NA	
Protected Phases	4	4	5	2	6	
Permitted Phases						
Actuated Green, G (s)	33.0	33.0	21.0	109.0	84.0	
Effective Green, g (s)	31.8	31.8	20.8	107.4	82.4	
Actuated g/C Ratio	0.21	0.21	0.14	0.72	0.55	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	375	335	245	1333	1683	
v/s Ratio Prot	c0.12	0.02	c0.07	0.33	c0.39	
v/s Ratio Perm						
v/c Ratio	0.56	0.08	0.51	0.46	0.71	
Uniform Delay, d1	52.8	47.3	59.9	9.1	24.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.9	0.4	7.5	1.2	2.5	
Delay (s)	58.8	47.8	67.4	10.2	27.5	
Level of Service	E	D	E	B	C	
Approach Delay (s)	54.8			19.9	27.5	
Approach LOS	D			B	C	

Intersection Summary			
HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	996	29	227	830	195	4	228	254	202	366	262
Future Volume (veh/h)	165	996	29	227	830	195	4	228	254	202	366	262
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	1.00		0.96	1.00		0.91	1.00		0.91
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683
Adj Flow Rate, veh/h	179	1083	32	247	902	212	4	248	276	220	398	285
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	174	1361	40	272	828	674	7	238	425	200	442	494
Arrive On Green	0.11	0.43	0.43	0.17	0.49	0.49	0.00	0.14	0.14	0.13	0.26	0.26
Sat Flow, veh/h	1603	3162	93	1603	1683	1371	1603	1683	1295	1603	1683	1294
Grp Volume(v), veh/h	179	548	567	247	902	212	4	248	276	220	398	285
Grp Sat Flow(s),veh/h/ln	1603	1599	1656	1603	1683	1371	1603	1683	1295	1603	1683	1294
Q Serve(g_s), s	13.0	35.6	35.6	18.1	59.0	11.2	0.3	17.0	17.0	15.0	27.4	21.3
Cycle Q Clear(g_c), s	13.0	35.6	35.6	18.1	59.0	11.2	0.3	17.0	17.0	15.0	27.4	21.3
Prop In Lane	1.00		0.06	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	174	688	713	272	828	674	7	238	425	200	442	494
V/C Ratio(X)	1.03	0.80	0.80	0.91	1.09	0.31	0.60	1.04	0.65	1.10	0.90	0.58
Avail Cap(c_a), veh/h	174	688	713	307	828	674	53	238	425	200	442	494
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.5	29.6	29.6	48.9	30.5	18.3	59.7	51.5	36.1	52.5	42.7	30.5
Incr Delay (d2), s/veh	76.6	6.5	6.3	27.4	58.6	0.3	64.3	69.1	7.5	92.2	24.0	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	14.7	15.1	9.3	36.4	3.6	0.2	11.7	7.9	11.1	14.2	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	130.1	36.1	35.9	76.3	89.1	18.6	124.0	120.6	43.6	144.7	66.8	35.3
LnGrp LOS	F	D	D	E	F	B	F	F	D	F	E	D
Approach Vol, veh/h		1294			1361			528			903	
Approach Delay, s/veh		49.0			75.8			80.4			75.8	
Approach LOS		D			E			F			E	

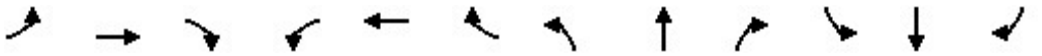
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	21.0	24.3	55.7	4.5	35.5	17.0	63.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	15.0	17.0	23.0	49.0	4.0	28.0	13.0	59.0
Max Q Clear Time (g_c+I1), s	17.0	19.0	20.1	37.6	2.3	29.4	15.0	61.0
Green Ext Time (p_c), s	0.0	0.0	0.2	5.6	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	67.9
HCM 6th LOS	E

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	148	148	79	511	680	78
Future Volume (veh/h)	148	148	79	511	680	78
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	161	161	86	555	739	85
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	208	208	459	937	1609	185
Arrive On Green	0.25	0.25	0.50	0.50	0.50	0.50
Sat Flow, veh/h	836	836	665	1870	3305	369
Grp Volume(v), veh/h	323	0	86	555	409	415
Grp Sat Flow(s),veh/h/ln	1678	0	665	1870	1777	1804
Q Serve(g_s), s	5.7	0.0	3.1	6.7	4.8	4.8
Cycle Q Clear(g_c), s	5.7	0.0	7.8	6.7	4.8	4.8
Prop In Lane	0.50	0.50	1.00			0.20
Lane Grp Cap(c), veh/h	417	0	459	937	890	904
V/C Ratio(X)	0.78	0.00	0.19	0.59	0.46	0.46
Avail Cap(c_a), veh/h	841	0	459	937	890	904
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.2	0.0	7.7	5.6	5.2	5.2
Incr Delay (d2), s/veh	3.1	0.0	0.9	2.7	1.7	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	0.4	1.9	1.2	1.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.3	0.0	8.6	8.4	6.9	6.8
LnGrp LOS	B	A	A	A	A	A
Approach Vol, veh/h	323			641	824	
Approach Delay, s/veh	14.3			8.4	6.9	
Approach LOS	B			A	A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		20.0		11.9		20.0
Change Period (Y+Rc), s		4.0		4.0		4.0
Max Green Setting (Gmax), s		16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s		9.8		7.7		6.8
Green Ext Time (p_c), s		2.2		0.7		3.6

Intersection Summary	
HCM 6th Ctrl Delay	8.8
HCM 6th LOS	A



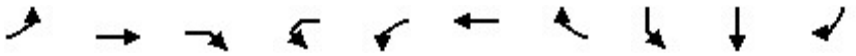
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	1112	62	204	934	346	111	393	252	312	427	58
Future Volume (veh/h)	82	1112	62	204	934	346	111	393	252	312	427	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	89	1209	67	222	1015	376	121	427	0	339	464	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	114	1185	528	218	1392	621	139	632		336	466	63
Arrive On Green	0.06	0.33	0.33	0.12	0.39	0.39	0.08	0.18	0.00	0.19	0.29	0.29
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	3554	1585	1781	1612	219
Grp Volume(v), veh/h	89	1209	67	222	1015	376	121	427	0	339	0	527
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1777	1585	1781	0	1831
Q Serve(g_s), s	4.4	30.0	2.6	11.0	21.9	17.0	6.0	10.1	0.0	17.0	0.0	25.9
Cycle Q Clear(g_c), s	4.4	30.0	2.6	11.0	21.9	17.0	6.0	10.1	0.0	17.0	0.0	25.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	114	1185	528	218	1392	621	139	632		336	0	529
V/C Ratio(X)	0.78	1.02	0.13	1.02	0.73	0.61	0.87	0.68		1.01	0.00	1.00
Avail Cap(c_a), veh/h	139	1185	528	218	1392	621	139	632		336	0	529
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.5	30.0	20.9	39.5	23.3	21.8	41.1	34.6	0.0	36.5	0.0	32.0
Incr Delay (d2), s/veh	20.7	31.5	0.1	66.2	2.0	1.7	41.5	5.7	0.0	51.0	0.0	38.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	17.4	1.0	8.7	9.1	6.4	4.2	4.8	0.0	12.0	0.0	16.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.2	61.5	21.0	105.7	25.3	23.5	82.6	40.3	0.0	87.5	0.0	70.2
LnGrp LOS	E	F	C	F	C	C	F	D		F	A	E
Approach Vol, veh/h		1365			1613			548	A		866	
Approach Delay, s/veh		59.5			35.9			49.6			77.0	
Approach LOS		E			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	20.0	15.0	34.0	11.0	30.0	9.7	39.3
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	17.0	16.0	11.0	30.0	7.0	26.0	7.0	34.0
Max Q Clear Time (g_c+I1), s	19.0	12.1	13.0	32.0	8.0	27.9	6.4	23.9
Green Ext Time (p_c), s	0.0	1.0	0.0	0.0	0.0	0.0	0.0	5.9

Intersection Summary	
HCM 6th Ctrl Delay	53.1
HCM 6th LOS	D

Notes

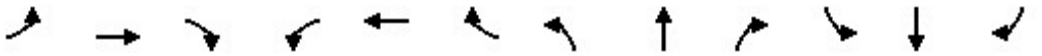
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	250	1025	157	0	157	827	37	45	365	210
Future Volume (vph)	250	1025	157	0	157	827	37	45	365	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95			1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.99			1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)	1770	3539	1583		1770	3517			1853	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00			0.99	1.00
Satd. Flow (perm)	1770	3539	1583		1770	3517			1853	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	272	1114	171	0	171	899	40	49	397	228
RTOR Reduction (vph)	0	0	0	0	0	3	0	0	0	148
Lane Group Flow (vph)	272	1114	171	0	171	936	0	0	446	80
Turn Type	Prot	NA	Perm	Prot	Prot	NA		Split	NA	Perm
Protected Phases	7	4		3	3	8		6	6	
Permitted Phases			4							6
Actuated Green, G (s)	17.1	34.1	34.1		11.4	28.4			31.0	31.0
Effective Green, g (s)	17.1	34.1	34.1		11.4	28.4			31.0	31.0
Actuated g/C Ratio	0.19	0.39	0.39		0.13	0.32			0.35	0.35
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	342	1363	609		228	1128			649	554
v/s Ratio Prot	c0.15	c0.31			0.10	0.27			c0.24	
v/s Ratio Perm			0.11							0.05
v/c Ratio	0.80	0.82	0.28		0.75	0.83			0.69	0.14
Uniform Delay, d1	34.0	24.4	18.7		37.2	27.8			24.6	19.7
Progression Factor	1.00	1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	12.0	3.9	0.3		13.0	7.1			5.9	0.5
Delay (s)	46.1	28.3	19.0		50.1	34.9			30.5	20.2
Level of Service	D	C	B		D	C			C	C
Approach Delay (s)		30.4				37.3			27.0	
Approach LOS		C				D			C	

Intersection Summary			
HCM 2000 Control Delay	32.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	88.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	262	47	511	314	79	48	530	247	193	652	75
Future Volume (veh/h)	70	262	47	511	314	79	48	530	247	193	652	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	76	285	51	448	491	0	52	576	268	210	709	82
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	104	406	76	436	458		48	605	454	238	787	91
Arrive On Green	0.16	0.16	0.16	0.25	0.25	0.00	0.48	0.48	0.48	0.48	0.48	0.48
Sat Flow, veh/h	642	2514	469	1781	1870	1585	31	1266	949	652	1646	190
Grp Volume(v), veh/h	218	0	194	448	491	0	463	0	433	210	0	791
Grp Sat Flow(s),veh/h/ln	1838	0	1786	1781	1870	1585	714	0	1531	652	0	1836
Q Serve(g_s), s	13.5	0.0	12.3	29.4	29.4	0.0	10.0	0.0	24.6	32.8	0.0	47.4
Cycle Q Clear(g_c), s	13.5	0.0	12.3	29.4	29.4	0.0	57.4	0.0	24.6	57.4	0.0	47.4
Prop In Lane	0.35		0.26	1.00		1.00	0.11		0.62	1.00		0.10
Lane Grp Cap(c), veh/h	297	0	289	436	458		375	0	732	238	0	878
V/C Ratio(X)	0.73	0.00	0.67	1.03	1.07		1.24	0.00	0.59	0.88	0.00	0.90
Avail Cap(c_a), veh/h	297	0	289	436	458		375	0	732	238	0	878
HCM 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
Upstream Filter(I)	1.00	0.00	1.00	0.77	0.77	0.00	0.86	0.00	0.86	0.88	0.00	0.88
Uniform Delay (d), s/veh	47.8	0.0	47.3	45.3	45.3	0.0	29.8	0.0	22.8	46.1	0.0	28.7
Incr Delay (d2), s/veh	14.8	0.0	11.9	44.7	57.5	0.0	124.8	0.0	1.1	27.0	0.0	11.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	0.0	6.4	18.3	20.8	0.0	19.8	0.0	9.0	8.2	0.0	22.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.6	0.0	59.2	90.0	102.8	0.0	154.6	0.0	23.8	73.1	0.0	39.7
LnGrp LOS	E	A	E	F	F		F	A	C	E	A	D
Approach Vol, veh/h		412			939	A		896			1001	
Approach Delay, s/veh		61.0			96.7			91.5			46.7	
Approach LOS		E			F			F			D	

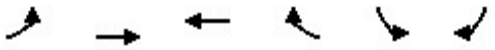
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		34.0		62.0		24.0		62.0				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		29.4		57.4		19.4		57.4				
Max Q Clear Time (g_c+I1), s		31.4		59.4		15.5		59.4				
Green Ext Time (p_c), s		0.0		0.0		0.9		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			75.3									
HCM 6th LOS			E									

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	606	627	178	445	169
Future Volume (veh/h)	0	606	627	178	445	169
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	659	682	193	484	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2
Cap, veh/h	0	1236	951	269	775	
Arrive On Green	0.00	0.35	0.35	0.35	0.43	0.00
Sat Flow, veh/h	0	3741	2828	773	1781	1585
Grp Volume(v), veh/h	0	659	443	432	484	0
Grp Sat Flow(s),veh/h/ln	0	1777	1777	1731	1781	1585
Q Serve(g_s), s	0.0	5.5	8.0	8.0	7.8	0.0
Cycle Q Clear(g_c), s	0.0	5.5	8.0	8.0	7.8	0.0
Prop In Lane	0.00			0.45	1.00	1.00
Lane Grp Cap(c), veh/h	0	1236	618	602	775	
V/C Ratio(X)	0.00	0.53	0.72	0.72	0.62	
Avail Cap(c_a), veh/h	0	1545	773	753	775	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	9.6	10.4	10.4	8.1	0.0
Incr Delay (d2), s/veh	0.0	0.4	2.4	2.5	3.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.6	2.6	2.6	2.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	10.0	12.8	12.9	11.9	0.0
LnGrp LOS	A	A	B	B	B	
Approach Vol, veh/h		659	875		484	A
Approach Delay, s/veh		10.0	12.9		11.9	
Approach LOS		A	B		B	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			16.8		20.0	16.8
Change Period (Y+Rc), s			4.0		4.0	4.0
Max Green Setting (Gmax), s			16.0		16.0	16.0
Max Q Clear Time (g_c+I1), s			7.5		9.8	10.0
Green Ext Time (p_c), s			2.9		0.9	2.8

Intersection Summary		
HCM 6th Ctrl Delay	11.7	
HCM 6th LOS	B	

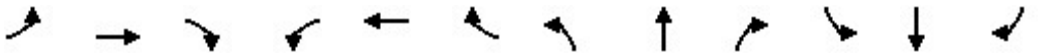
Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	193	111	116	576	809	317
Future Volume (vph)	193	111	116	576	809	317
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	4.2	5.6	5.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.90	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	1863	3065	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	1863	3065	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	210	121	126	626	879	345
RTOR Reduction (vph)	0	95	0	0	27	0
Lane Group Flow (vph)	210	26	126	626	1197	0
Confl. Peds. (#/hr)	32	30				68
Confl. Bikes (#/hr)		5				16
Turn Type	Prot	Prot	Prot	NA	NA	
Protected Phases	4	4	5	2	6	
Permitted Phases						
Actuated Green, G (s)	33.0	33.0	21.0	109.0	84.0	
Effective Green, g (s)	31.8	31.8	20.8	107.4	82.4	
Actuated g/C Ratio	0.21	0.21	0.14	0.72	0.55	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	375	335	245	1333	1683	
v/s Ratio Prot	c0.12	0.02	c0.07	0.34	c0.39	
v/s Ratio Perm						
v/c Ratio	0.56	0.08	0.51	0.47	0.71	
Uniform Delay, d1	52.8	47.3	59.9	9.1	25.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.9	0.4	7.5	1.2	2.6	
Delay (s)	58.8	47.8	67.4	10.3	27.6	
Level of Service	E	D	E	B	C	
Approach Delay (s)	54.8			19.9	27.6	
Approach LOS	D			B	C	

Intersection Summary			
HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	168	996	29	227	830	198	4	229	254	204	367	264
Future Volume (veh/h)	168	996	29	227	830	198	4	229	254	204	367	264
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	1.00		0.96	1.00		0.92	1.00		0.91
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683
Adj Flow Rate, veh/h	183	1083	32	247	902	215	4	249	276	222	399	287
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	160	1308	39	272	814	663	7	267	449	200	470	506
Arrive On Green	0.10	0.41	0.41	0.17	0.48	0.48	0.00	0.16	0.16	0.13	0.28	0.28
Sat Flow, veh/h	1603	3161	93	1603	1683	1371	1603	1683	1307	1603	1683	1300
Grp Volume(v), veh/h	183	548	567	247	902	215	4	249	276	222	399	287
Grp Sat Flow(s),veh/h/ln	1603	1599	1656	1603	1683	1371	1603	1683	1307	1603	1683	1300
Q Serve(g_s), s	12.0	36.6	36.7	18.1	58.0	11.5	0.3	17.5	19.0	15.0	26.9	21.1
Cycle Q Clear(g_c), s	12.0	36.6	36.7	18.1	58.0	11.5	0.3	17.5	19.0	15.0	26.9	21.1
Prop In Lane	1.00		0.06	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	160	662	685	272	814	663	7	267	449	200	470	506
V/C Ratio(X)	1.14	0.83	0.83	0.91	1.11	0.32	0.60	0.93	0.62	1.11	0.85	0.57
Avail Cap(c_a), veh/h	160	662	685	307	814	663	53	267	449	200	470	506
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.0	31.4	31.4	48.9	31.0	19.0	59.7	49.9	34.4	52.5	40.9	29.7
Incr Delay (d2), s/veh	114.2	8.6	8.3	27.4	65.7	0.3	64.3	40.5	6.2	95.4	17.2	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.9	15.5	16.0	9.3	37.4	3.7	0.2	10.4	7.6	11.3	13.3	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	168.2	40.0	39.7	76.3	96.7	19.3	124.0	90.4	40.5	147.9	58.1	34.2
LnGrp LOS	F	D	D	E	F	B	F	F	D	F	E	C
Approach Vol, veh/h		1298			1364			529			908	
Approach Delay, s/veh		57.9			80.8			64.6			72.5	
Approach LOS		E			F			E			E	

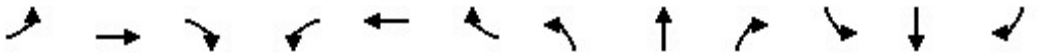
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	23.0	24.3	53.7	4.5	37.5	16.0	62.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	15.0	19.0	23.0	47.0	4.0	30.0	12.0	58.0
Max Q Clear Time (g_c+I1), s	17.0	21.0	20.1	38.7	2.3	28.9	14.0	60.0
Green Ext Time (p_c), s	0.0	0.0	0.2	4.5	0.0	0.5	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	69.6
HCM 6th LOS	E

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	148	148	79	518	683	78
Future Volume (veh/h)	148	148	79	518	683	78
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	161	161	86	563	742	85
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	208	208	458	937	1610	184
Arrive On Green	0.25	0.25	0.50	0.50	0.50	0.50
Sat Flow, veh/h	836	836	663	1870	3307	368
Grp Volume(v), veh/h	323	0	86	563	410	417
Grp Sat Flow(s),veh/h/ln	1678	0	663	1870	1777	1804
Q Serve(g_s), s	5.7	0.0	3.1	6.9	4.8	4.8
Cycle Q Clear(g_c), s	5.7	0.0	7.9	6.9	4.8	4.8
Prop In Lane	0.50	0.50	1.00			0.20
Lane Grp Cap(c), veh/h	417	0	458	937	890	904
V/C Ratio(X)	0.78	0.00	0.19	0.60	0.46	0.46
Avail Cap(c_a), veh/h	841	0	458	937	890	904
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.2	0.0	7.7	5.7	5.2	5.2
Incr Delay (d2), s/veh	3.1	0.0	0.9	2.8	1.7	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	0.4	2.0	1.2	1.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.3	0.0	8.6	8.5	6.9	6.9
LnGrp LOS	B	A	A	A	A	A
Approach Vol, veh/h	323			649	827	
Approach Delay, s/veh	14.3			8.5	6.9	
Approach LOS	B			A	A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		20.0		11.9		20.0
Change Period (Y+Rc), s		4.0		4.0		4.0
Max Green Setting (Gmax), s		16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s		9.9		7.7		6.8
Green Ext Time (p_c), s		2.3		0.7		3.6

Intersection Summary	
HCM 6th Ctrl Delay	8.8
HCM 6th LOS	A



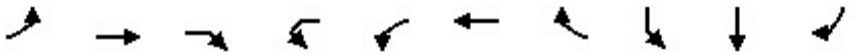
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	1112	62	207	934	346	112	397	254	312	434	58
Future Volume (veh/h)	82	1112	62	207	934	346	112	397	254	312	434	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	89	1209	67	225	1015	376	122	432	0	339	472	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	114	1185	528	218	1392	621	139	632		336	467	62
Arrive On Green	0.06	0.33	0.33	0.12	0.39	0.39	0.08	0.18	0.00	0.19	0.29	0.29
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	3554	1585	1781	1616	216
Grp Volume(v), veh/h	89	1209	67	225	1015	376	122	432	0	339	0	535
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1777	1585	1781	0	1832
Q Serve(g_s), s	4.4	30.0	2.6	11.0	21.9	17.0	6.1	10.2	0.0	17.0	0.0	26.0
Cycle Q Clear(g_c), s	4.4	30.0	2.6	11.0	21.9	17.0	6.1	10.2	0.0	17.0	0.0	26.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	114	1185	528	218	1392	621	139	632		336	0	529
V/C Ratio(X)	0.78	1.02	0.13	1.03	0.73	0.61	0.88	0.68		1.01	0.00	1.01
Avail Cap(c_a), veh/h	139	1185	528	218	1392	621	139	632		336	0	529
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.5	30.0	20.9	39.5	23.3	21.8	41.1	34.6	0.0	36.5	0.0	32.0
Incr Delay (d2), s/veh	20.7	31.5	0.1	70.0	2.0	1.7	43.2	5.9	0.0	51.0	0.0	41.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	17.4	1.0	9.0	9.1	6.4	4.3	4.9	0.0	12.0	0.0	17.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.2	61.5	21.0	109.5	25.3	23.5	84.3	40.5	0.0	87.5	0.0	73.9
LnGrp LOS	E	F	C	F	C	C	F	D		F	A	F
Approach Vol, veh/h		1365			1616			554	A		874	
Approach Delay, s/veh		59.5			36.6			50.2			79.2	
Approach LOS		E			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	20.0	15.0	34.0	11.0	30.0	9.7	39.3
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	17.0	16.0	11.0	30.0	7.0	26.0	7.0	34.0
Max Q Clear Time (g_c+I1), s	19.0	12.2	13.0	32.0	8.1	28.0	6.4	23.9
Green Ext Time (p_c), s	0.0	1.0	0.0	0.0	0.0	0.0	0.0	5.9

Intersection Summary	
HCM 6th Ctrl Delay	53.8
HCM 6th LOS	D

Notes

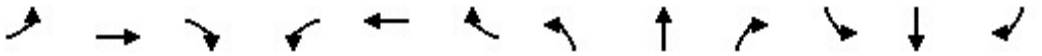
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	250	1025	158	0	157	828	37	45	365	210
Future Volume (vph)	250	1025	158	0	157	828	37	45	365	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95			1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.99			1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00			0.99	1.00
Satd. Flow (prot)	1770	3539	1583		1770	3517			1853	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00			0.99	1.00
Satd. Flow (perm)	1770	3539	1583		1770	3517			1853	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	272	1114	172	0	171	900	40	49	397	228
RTOR Reduction (vph)	0	0	0	0	0	3	0	0	0	148
Lane Group Flow (vph)	272	1114	172	0	171	937	0	0	446	80
Turn Type	Prot	NA	Perm	Prot	Prot	NA		Split	NA	Perm
Protected Phases	7	4		3	3	8		6	6	
Permitted Phases			4							6
Actuated Green, G (s)	17.1	34.1	34.1		11.4	28.4			31.0	31.0
Effective Green, g (s)	17.1	34.1	34.1		11.4	28.4			31.0	31.0
Actuated g/C Ratio	0.19	0.39	0.39		0.13	0.32			0.35	0.35
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	342	1363	609		228	1128			649	554
v/s Ratio Prot	c0.15	c0.31			0.10	0.27			c0.24	
v/s Ratio Perm			0.11							0.05
v/c Ratio	0.80	0.82	0.28		0.75	0.83			0.69	0.14
Uniform Delay, d1	34.0	24.4	18.8		37.2	27.8			24.6	19.7
Progression Factor	1.00	1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	12.0	3.9	0.3		13.0	7.1			5.9	0.5
Delay (s)	46.1	28.3	19.0		50.1	35.0			30.5	20.2
Level of Service	D	C	B		D	C			C	C
Approach Delay (s)		30.4				37.3			27.0	
Approach LOS		C				D			C	

Intersection Summary			
HCM 2000 Control Delay	32.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	88.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



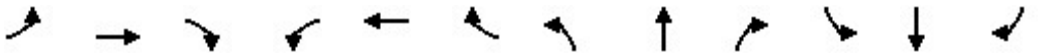
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	262	47	511	314	79	48	530	247	193	652	75
Future Volume (veh/h)	70	262	47	511	314	79	48	530	247	193	652	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	76	285	51	555	341	0	52	576	268	210	709	82
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	347	301	54	656	355		55	680	474	258	821	95
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.00	0.50	0.50	0.50	0.50	0.50	0.50
Sat Flow, veh/h	1781	1544	276	3456	1870	1585	42	1363	949	652	1646	190
Grp Volume(v), veh/h	76	0	336	555	341	0	464	0	432	210	0	791
Grp Sat Flow(s),veh/h/ln	1781	0	1821	1728	1870	1585	823	0	1531	652	0	1836
Q Serve(g_s), s	4.3	0.0	21.7	18.4	21.5	0.0	14.3	0.0	23.5	35.9	0.0	45.1
Cycle Q Clear(g_c), s	4.3	0.0	21.7	18.4	21.5	0.0	59.4	0.0	23.5	59.4	0.0	45.1
Prop In Lane	1.00		0.15	1.00		1.00	0.11		0.62	1.00		0.10
Lane Grp Cap(c), veh/h	347	0	355	656	355		445	0	764	258	0	917
V/C Ratio(X)	0.22	0.00	0.95	0.85	0.96		1.04	0.00	0.57	0.82	0.00	0.86
Avail Cap(c_a), veh/h	347	0	355	656	355		445	0	764	258	0	917
HCM 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
Upstream Filter(I)	1.00	0.00	1.00	0.77	0.77	0.00	0.86	0.00	0.86	0.88	0.00	0.88
Uniform Delay (d), s/veh	40.3	0.0	47.3	46.5	47.8	0.0	30.3	0.0	20.8	42.6	0.0	26.2
Incr Delay (d2), s/veh	1.4	0.0	36.0	7.9	31.8	0.0	51.1	0.0	0.8	16.2	0.0	7.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	13.3	8.6	13.1	0.0	19.7	0.0	8.4	7.4	0.0	20.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.7	0.0	83.3	54.4	79.5	0.0	81.4	0.0	21.6	58.8	0.0	33.8
LnGrp LOS	D	A	F	D	E		F	A	C	E	A	C
Approach Vol, veh/h		412			896	A		896			1001	
Approach Delay, s/veh		75.6			64.0			52.6			39.1	
Approach LOS		E			E			D			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		27.2		64.0		27.8		64.0				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		22.6		59.4		23.2		59.4				
Max Q Clear Time (g_c+I1), s		23.5		61.4		23.7		61.4				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			54.5									
HCM 6th LOS			D									

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	168	996	29	227	830	198	4	229	254	204	367	264
Future Volume (veh/h)	168	996	29	227	830	198	4	229	254	204	367	264
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.90	1.00		0.96	1.00		0.92	1.00		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683
Adj Flow Rate, veh/h	183	1083	32	247	902	215	4	249	276	222	399	287
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	208	1142	34	271	1017	242	7	302	478	246	553	617
Arrive On Green	0.13	0.36	0.36	0.17	0.40	0.40	0.00	0.18	0.18	0.15	0.33	0.33
Sat Flow, veh/h	1603	3160	93	1603	2537	604	1603	1683	1318	1603	1683	1315
Grp Volume(v), veh/h	183	548	567	247	568	549	4	249	276	222	399	287
Grp Sat Flow(s),veh/h/ln	1603	1599	1654	1603	1599	1541	1603	1683	1318	1603	1683	1315
Q Serve(g_s), s	13.1	39.0	39.0	17.7	38.7	38.8	0.3	16.7	20.2	15.9	24.4	17.7
Cycle Q Clear(g_c), s	13.1	39.0	39.0	17.7	38.7	38.8	0.3	16.7	20.2	15.9	24.4	17.7
Prop In Lane	1.00		0.06	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	208	578	598	271	641	618	7	302	478	246	553	617
V/C Ratio(X)	0.88	0.95	0.95	0.91	0.89	0.89	0.60	0.83	0.58	0.90	0.72	0.47
Avail Cap(c_a), veh/h	233	587	607	287	642	618	55	302	478	260	553	617
HCM 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.1	36.3	36.3	47.8	32.6	32.6	58.2	46.3	31.4	48.7	34.6	22.0
Incr Delay (d2), s/veh	27.9	24.8	24.3	30.1	14.1	14.7	64.1	22.0	5.0	30.5	7.9	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	18.9	19.5	9.3	17.1	16.7	0.2	8.8	7.1	8.4	11.1	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.0	61.1	60.6	77.9	46.7	47.4	122.3	68.3	36.5	79.2	42.5	24.5
LnGrp LOS	E	E	E	E	D	D	F	E	D	E	D	C
Approach Vol, veh/h		1298			1364			529			908	
Approach Delay, s/veh		63.3			52.6			52.1			45.8	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	25.0	23.8	46.3	4.5	42.5	19.2	51.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	19.0	21.0	21.0	43.0	4.0	36.0	17.0	47.0
Max Q Clear Time (g_c+I1), s	17.9	22.2	19.7	41.0	2.3	26.4	15.1	40.8
Green Ext Time (p_c), s	0.1	0.0	0.1	1.3	0.0	2.6	0.1	3.6

Intersection Summary	
HCM 6th Ctrl Delay	54.4
HCM 6th LOS	D

Appendix C

Volume Spreadsheet

Intersection Number: 1
Synchro Node Number: 2953
Intersection Name: Front Street & Soquel Avenue
Peak Hour: AM
Count Date: 05/14/19
Scenario: 530 Front Street TIA
Date of Analysis: 05/20/19

	Movements												
	North Approach			East Approach			South Approach			West Approach			
Scenario:	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	*Total*
INDEX	7	6	5	13	12	11	4	3	2	10	9	8	
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions	20	133	18	50	78	238	66	230	9	23	57	25	947
Project Trips	0	2	0	0	0	8	12	18	5	2	0	0	47
Existing + Project	20	135	18	50	78	246	78	248	14	25	57	25	994

Intersection Number: 2
Synchro Node Number: 2955
Intersection Name: River Street & Soquel Avenue
Peak Hour: AM
Count Date: 05/14/19
Scenario: 530 Front Street TIA
Date of Analysis: 05/20/19

	Movements												
	North Approach			East Approach			South Approach			West Approach			
Scenario:	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	*Total*
INDEX	7	6	5	13	12	11	4	3	2	10	9	8	
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions	44	0	65	91	324	0	0	0	0	0	135	0	659
Project Trips	5	0	0	0	4	0	0	0	0	0	12	0	21
Existing + Project	49	0	65	91	328	0	0	0	0	0	147	0	680

Intersection Number: 3
Synchro Node Number: 2952
Intersection Name: Front Street & Cathcart Street
Peak Hour: AM
Count Date: 05/14/19
Scenario: 530 Front Street TIA
Date of Analysis: 05/20/19

	Movements												
	North Approach			East Approach			South Approach			West Approach			
Scenario:	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	*Total*
INDEX	7	6	5	13	12	11	4	3	2	10	9	8	
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions	62	323	0	0	0	0	0	281	17	8	0	32	723
Project Trips	0	12	0	0	0	0	0	4	0	0	0	0	16
Existing + Project	62	335	0	0	0	0	0	285	17	8	0	32	739

Intersection Number: 4
Synchro Node Number: 2950
Intersection Name: Front Street & Laurel Street
Peak Hour: AM
Count Date: 05/14/19
Scenario: 530 Front Street TIA
Date of Analysis: 05/20/19

	Movements												
	North Approach			East Approach			South Approach			West Approach			
Scenario:	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	*Total*
INDEX	7	6	5	13	12	11	4	3	2	10	9	8	
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions	34	163	33	91	532	279	198	134	5	13	356	56	1894
Project Trips	5	2	5	2	0	0	0	1	0	0	0	2	17
Existing + Project	39	165	38	93	532	279	198	135	5	13	356	58	1911

Intersection Number: 5
Synchro Node Number: 2954
Intersection Name: Front Street & Cooper Street
Peak Hour: AM
Count Date: 05/14/19
Scenario: 530 Front Street TIA
Date of Analysis: 05/20/19

	Movements												
	North Approach			East Approach			South Approach			West Approach			
Scenario:	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	*Total*
INDEX	7	6	5	13	12	11	4	3	2	10	9	8	
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions	23	176	0	0	0	0	0	206	44	41	0	50	540
Project Trips	0	2	0	0	0	0	0	18	0	0	0	0	20
Existing + Project	23	178	0	0	0	0	0	224	44	41	0	50	560

Intersection Number: 6
Synchro Node Number: 2931
Intersection Name: River Street & Water Street
Peak Hour: AM
Count Date: 05/14/19
Scenario: 530 Front Street TIA
Date of Analysis: 05/20/19

	Movements												
	North Approach			East Approach			South Approach			West Approach			
Scenario:	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	*Total*
INDEX	7	6	5	13	12	11	4	3	2	10	9	8	
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions	2	91	73	283	770	255	136	186	31	18	323	10	2178
Project Trips	0	4	0	0	0	2	5	12	2	0	0	0	25
Existing + Project	2	95	73	283	770	257	141	198	33	18	323	10	2203

Intersection Number: 7
Synchro Node Number: 2930
Intersection Name: Pacific Avenue/Front Stre & Mission Street/Water Street
Peak Hour: AM
Count Date: 05/14/19
Scenario: 530 Front Street TIA
Date of Analysis: 05/20/19

	Movements												
	North Approach			East Approach			South Approach			West Approach			
Scenario:	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	*Total*
INDEX	7	6	5	13	12	11	4	3	2	10	9	8	
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions	119	51	9	1	658	126	0	0	0	65	348	88	1465
Project Trips	0	0	0	0	2	0	0	0	0	1	0	0	3
Existing + Project	119	51	9	1	660	126	0	0	0	66	348	88	1468

Intersection Number: 1
Synchro Node Number: 2953
Intersection Name: Front Street & Soquel Avenue
Peak Hour: PM
Count Date: 05/14/19
Scenario: 530 Front Street TIA
Date of Analysis: 05/20/19

	Movements												
	North Approach			East Approach			South Approach			West Approach			
Scenario:	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	*Total*
INDEX	7	6	5	13	12	11	4	3	2	10	9	8	
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions	35	279	101	49	107	370	124	285	15	64	160	53	1642
Project Trips	0	3	0	0	0	15	4	7	2	3	0	0	34
Existing + Project	35	282	101	49	107	385	128	292	17	67	160	53	1676
Cumulative Baseline Conditions	75	649	193	79	314	496	243	523	46	44	262	70	2994
Cumulative + Proj Conditions	75	652	193	79	314	511	247	530	48	47	262	70	3028

Intersection Number: 2
Synchro Node Number: 2955
Intersection Name: River Street & Soquel Avenue
Peak Hour: PM
Count Date: 05/14/19
Scenario: 530 Front Street TIA
Date of Analysis: 05/20/19

	Movements												
	North Approach			East Approach			South Approach			West Approach			
Scenario:	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	*Total*
INDEX	7	6	5	13	12	11	4	3	2	10	9	8	
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions	185	0	293	122	358	0	0	0	0	0	378	0	1336
Project Trips	8	0	0	0	7	0	0	0	0	0	4	0	19
Existing + Project	193	0	293	122	365	0	0	0	0	0	382	0	1355
Cumulative Baseline Conditions	161	0	445	178	620	0	0	0	0	0	602	0	2006
Cumulative + Proj Conditions	169	0	445	178	627	0	0	0	0	0	606	0	2025

Intersection Number: 3
Synchro Node Number: 2952
Intersection Name: Front Street & Cathcart Street
Peak Hour: PM
Count Date: 05/14/19
Scenario: 530 Front Street TIA
Date of Analysis: 05/20/19

	Movements												
	North Approach			East Approach			South Approach			West Approach			
Scenario:	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	*Total*
INDEX	7	6	5	13	12	11	4	3	2	10	9	8	
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions	141	544	0	0	0	0	0	339	24	20	0	85	1153
Project Trips	0	4	0	0	0	0	0	7	0	0	0	0	11
Existing + Project	141	548	0	0	0	0	0	346	24	20	0	85	1164
Cumulative Baseline Conditions	317	805	0	0	0	0	0	569	116	111	0	193	2111
Cumulative + Proj Conditions	317	809	0	0	0	0	0	576	116	111	0	193	2122

Intersection Number: 4
Synchro Node Number: 2950
Intersection Name: Front Street & Laurel Street
Peak Hour: PM
Count Date: 05/14/19
Scenario: 530 Front Street TIA
Date of Analysis: 05/20/19

	Movements												
	North Approach			East Approach			South Approach			West Approach			
Scenario:	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	*Total*
INDEX	7	6	5	13	12	11	4	3	2	10	9	8	
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions	143	308	95	108	414	217	244	165	11	18	517	78	2318
Project Trips	2	1	2	3	0	0	0	1	0	0	0	3	12
Existing + Project	145	309	97	111	414	217	244	166	11	18	517	81	2330
Cumulative Baseline Conditions	262	366	202	195	830	227	254	228	4	29	996	165	3758
Cumulative + Proj Conditions	264	367	204	198	830	227	254	229	4	29	996	168	3770

Intersection Number: 5
Synchro Node Number: 2954
Intersection Name: Front Street & Cooper Street
Peak Hour: PM
Count Date: 05/14/19
Scenario: 530 Front Street TIA
Date of Analysis: 05/20/19

	Movements												
	North Approach			East Approach			South Approach			West Approach			
Scenario:	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	*Total*
INDEX	7	6	5	13	12	11	4	3	2	10	9	8	
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions	35	352	0	0	0	0	0	320	39	111	0	64	921
Project Trips	0	3	0	0	0	0	0	7	0	0	0	0	10
Existing + Project	35	355	0	0	0	0	0	327	39	111	0	64	931
Cumulative Baseline Conditions	78	680	0	0	0	0	0	511	79	148	0	148	1644
Cumulative + Proj Conditions	78	683	0	0	0	0	0	518	79	148	0	148	1654

Intersection Number: 6
Synchro Node Number: 2931
Intersection Name: River Street & Water Street
Peak Hour: PM
Count Date: 05/14/19
Scenario: 530 Front Street TIA
Date of Analysis: 05/20/19

	Movements												
	North Approach			East Approach			South Approach			West Approach			
Scenario:	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	*Total*
INDEX	7	6	5	13	12	11	4	3	2	10	9	8	
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions	23	255	222	211	601	224	316	264	95	61	614	38	2924
Project Trips	0	7	0	0	0	3	2	4	1	0	0	0	17
Existing + Project	23	262	222	211	601	227	318	268	96	61	614	38	2941
Cumulative Baseline Conditions	58	427	312	346	934	204	252	393	111	62	1112	82	4293
Cumulative + Proj Conditions	58	434	312	346	934	207	254	397	112	62	1112	82	4310

Intersection Number: 7
Synchro Node Number: 2930
Intersection Name: Pacific Avenue/Front Str & Mission Street/Water Street
Peak Hour: PM
Count Date: 05/14/19
Scenario: 530 Front Street TIA
Date of Analysis: 05/20/19

	Movements												
	North Approach			East Approach			South Approach			West Approach			
Scenario:	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	*Total*
INDEX	7	6	5	13	12	11	4	3	2	10	9	8	
PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions	191	109	11	1	582	126	0	0	0	143	675	153	1991
Project Trips	0	0	0	0	1	0	0	0	0	1	0	0	2
Existing + Project	191	109	11	1	583	126	0	0	0	144	675	153	1993
Cumulative Baseline Conditions	210	365	45	37	827	157	0	0	0	157	1025	250	3073
Cumulative + Proj Conditions	210	365	45	37	828	157	0	0	0	158	1025	250	3075