Attachment 26. Traffic Impact Study Report

Final Traffic Impact Study Report

493 Eastmoor Avenue

City of Daly City, California

January 17, 2020

TJKM

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EXECUTIVE SUMMARY

This report summarizes the results of the Traffic Impact Analysis (TIA) conducted for the proposed affordable residential development and office facility located at 493 Eastmoor Avenue in the City of Daly City. The purpose of this report is to provide summaries of anticipated traffic impacts to the surrounding transportation system.

The report also includes evaluations and recommendations concerning project site access and on-site circulation for vehicles, bicycles and pedestrians, evaluation of on-site vehicle parking supply, garbage/trash facilities, and queuing analysis at signalized study intersections.

To evaluate the impacts on the transportation infrastructure due to the addition of traffic from the proposed project, four study intersections are evaluated during the weekday a.m. peak hour and the p.m. peak hour under two study scenarios. The study intersections were evaluated under No Project and Plus Project scenarios for Existing conditions.

Project Trip Generation

The proposed development expects to generate a total net of 315 daily trips, of which 21 trips are generated during the a.m. peak hour and 26 trips are generated during the p.m. peak hour.

Existing Conditions

Under this scenario, all four of the study intersections operate at an acceptable LOS C and D or better during both a.m. and p.m. peak hours.

Existing plus Project Conditions

All study intersections are expected to operate at acceptable LOS C and D or better under Existing plus Project Conditions. Based on the City of Daly City and Caltrans Guideline thresholds impact criteria, the project expects to have **less-than-significant** impacts at all study intersections during both peak periods.

Site Access and On-Site Circulation

Access to the proposed project would be via one full access driveway on Eastmoor Avenue. Project site access and circulation are **adequate**.

Parking

The project site plan (dated June 12, 2019) shows a supply of 32 parking spaces, including two accessible spaces and three Electric Vehicle Stations (EVS).

Queuing and Driveway Analysis

The proposed project creates a **less-than-significant** impact to the expected left-turn or right-turn queues at the study intersections. The project driveway operates at an acceptable LOS and the 95th percentile queueing at the outbound approach of the project driveway is minimal.

Pedestrian, Bicycle and Transit Impacts

The proposed project does not conflict with existing and planned pedestrian or bicycle facilities, and will add a moderate amount of trips to existing transit facilities, which the existing transit capacity can accommodate. Therefore, the impact to pedestrian, bicycle, and transit facilities is **less-than-significant**.

1.0 INTRODUCTION

This report summarizes the results of the Traffic Impact Analysis (TIA) conducted for the proposed mixed-use development at 493 Eastmoor Avenue, located at the northwest quadrant of the Eastmoor Avenue/Sullivan Avenue intersection in the City of Daly City. To assess impacts on the transportation infrastructure due to additional traffic from the proposed project, evaluation of study intersections is in accordance with the standards set forth by the LOS policies of the City of Daly City.

The project site is located west of San Pedro Road as shown in **Figure 1**. The project proposes to construct a 7-story building to accommodate 72 units of affordable housing and 1,196 square feet of commercial/office development at the corner of Eastmoor Avenue and Sullivan Avenue. The proposed project would be accessible via one driveway on Eastmoor Avenue. The development consists of 35 studio, 36 one-bedroom, and one two-bedroom units. The project site is currently vacant.

The proposed project site is located 0.5 miles walking distance to the Colma BART station. Based on the project site plan dated June 12, 2019, the project would consist of the following:

- 72 affordable family housing units
- Approximately 1,196 square feet of first floor commercial/office development

1.1 Study Intersections and Scenarios

TJKM evaluated traffic conditions at four study intersections, approved by the City of Daly City staff, during the a.m. and p.m. peak hours for a typical weekday. The peak periods observed were between 7:00-9:00 a.m. and 4:00-6:00 p.m. The study intersections and associated traffic controls are as follows:

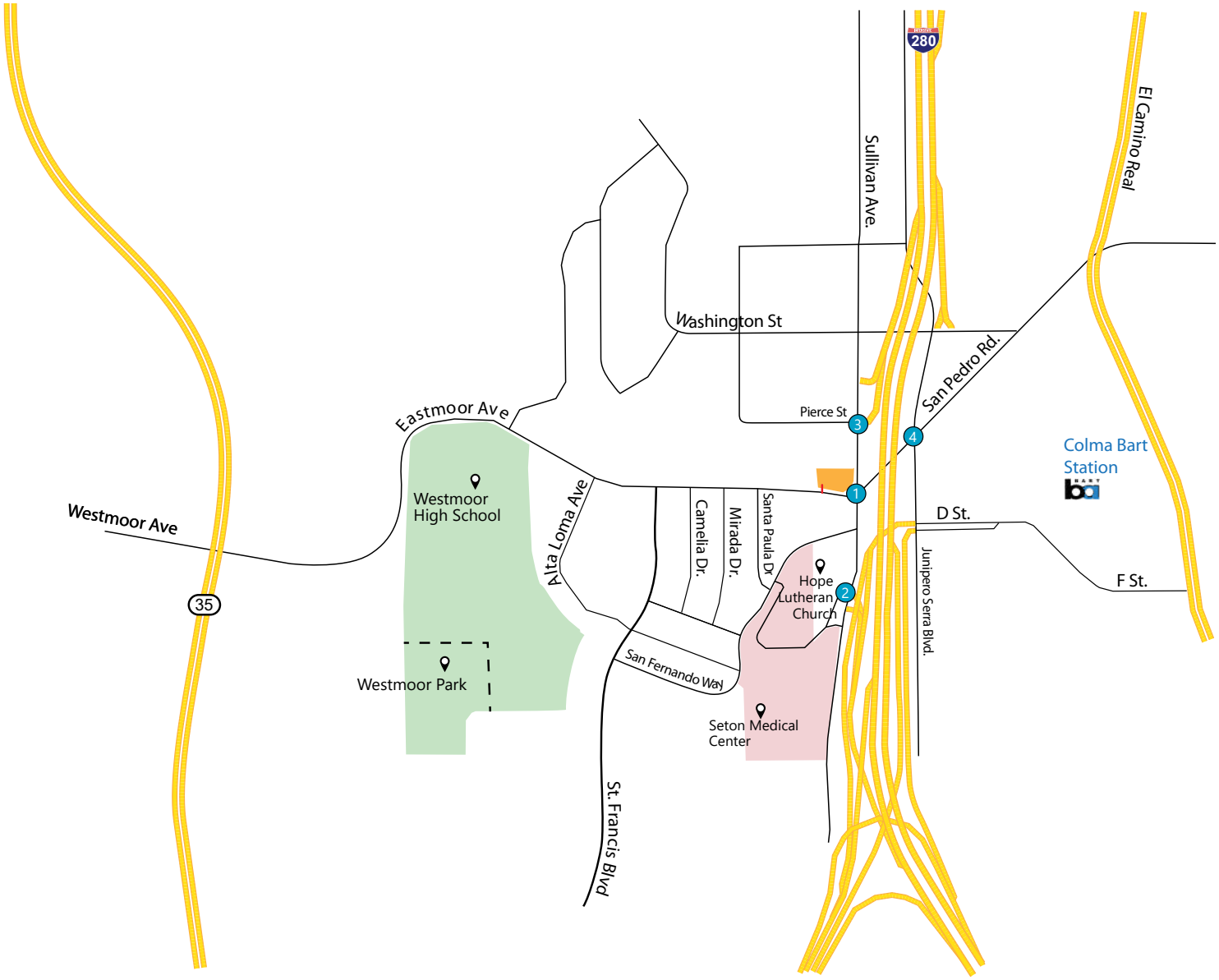
1. Eastmoor Avenue/Sullivan Avenue (Signal)
2. Sullivan Avenue/I-280 SB On Ramp (Signal)
3. Sullivan Avenue/Pierce Street (Signal)
4. San Pedro Road/Junipero Serra Boulevard (Signal)

Figure 1 illustrates the study intersections and the vicinity map of the proposed project. **Figure 2** shows the proposed project site plan.

This study addresses the following traffic scenarios:

- **Existing Conditions** – This scenario evaluates the study intersections based on existing traffic volumes, lane geometry and traffic controls.
- **Existing plus Project Conditions** – This scenario is identical to Existing Conditions, but with the addition of traffic from the proposed project.

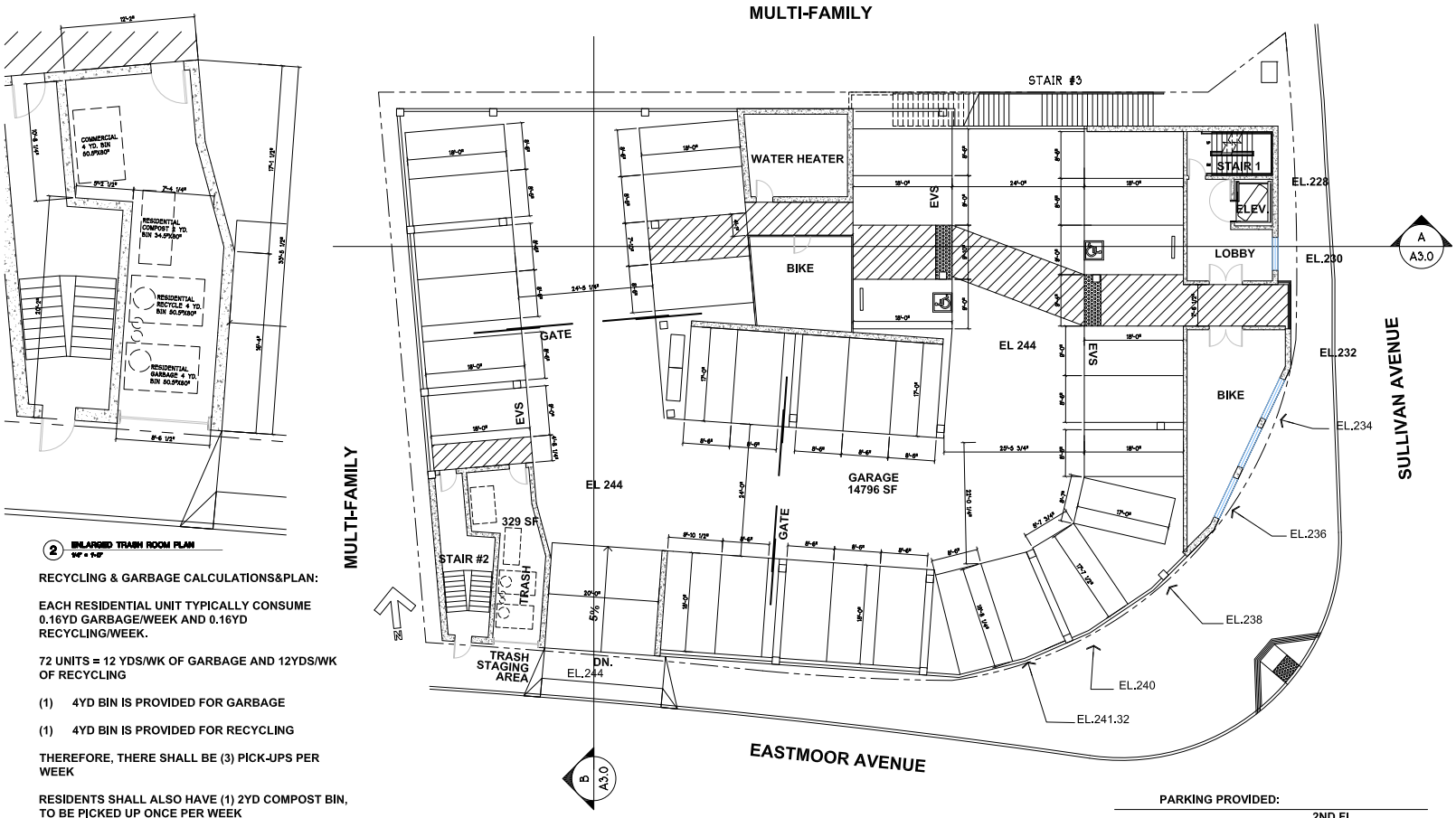
Figure 1: Vicinity Map



LEGEND

- Project Site
- Study Intersection

Figure 2: Site Map



RECYCLING & GARBAGE CALCULATIONS&PLAN:

EACH RESIDENTIAL UNIT TYPICALLY CONSUME 0.16YD GARBAGE/WEEK AND 0.16YD RECYCLING/WEEK.

72 UNITS = 12 YDS/WK OF GARBAGE AND 12YDS/WK OF RECYCLING

(1) 4YD BIN IS PROVIDED FOR GARBAGE

(1) 4YD BIN IS PROVIDED FOR RECYCLING

THEREFORE, THERE SHALL BE (3) PICK-UPS PER WEEK

RESIDENTS SHALL ALSO HAVE (1) 2YD COMPOST BIN, TO BE PICKED UP ONCE PER WEEK

COMMERCIAL/OFFICE SPACES SHALL HAVE (1) 4YD BIN, TO BE PICKED UP ONCE PER WEEK.

PARKING PROVIDED:

	2ND FL
STANDARD	30
ADA	2 (2 VAN)
	32

2.0 STUDY METHODOLOGY

2.1 Level of Service Analysis Methodology

Level of Service (LOS) is a qualitative measure that describes operational conditions as they relate to the traffic stream and perceptions by motorists and passengers. The LOS generally describes these conditions in terms of such factors as speed and travel time, delays, freedom to maneuver, traffic interruptions, comfort, convenience and safety. The operational LOS are given letter designations from A to F, with A representing the best operating conditions (free-flow) and F the worst (severely congested flow with high delays). Intersections generally are the capacity-controlling locations with respect to traffic operations on arterial and collector streets.

Signalized Intersections

The Highway Capacity Manual (HCM) 2000 Operations Methodology, described in Chapter 16 (HCM 2000), was used to perform the analysis of study intersections under traffic signal control. This methodology determines LOS based on average control delay per vehicle for the overall intersection during peak hour intersection operating conditions. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The City of Daly City adopts this LOS methodology in the City's 2030 General Plan. **Table 1** summarizes the relationship between the control delay and LOS for signalized intersections.

Unsignalized Intersections

The HCM 2000 Methodology for signalized intersections, described in Chapter 17 of the Highway Capacity Manual (HCM 2000), was used to perform the analysis of the study intersections under stop control. Average control delay, expressed in seconds per vehicle, is the basis for LOS ratings at stop-sign controlled intersections. At the side street, stop controlled intersections, or two-way stop controlled intersections, the methodology calculates control delay for each movement, not for the intersection as a whole. For approaches composed of a single lane, the control delay is the average delay of all movements in that lane. The delay ranges for unsignalized intersections are lower than for signalized intersections as drivers expect less delay at unsignalized intersections. **Table 2** summarizes the relationship between delay and LOS for unsignalized intersections.

Table 1: Level of Service Definitions for Signalized Intersections

Level of Service	Description
A	Very low control delay, up to 10 seconds per vehicle. Progression is extremely favorable, and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.
B	Control delay greater than 10 and up to 20 seconds per vehicle. There is good progression or short cycle lengths or both. More vehicles stop causing higher levels of delay.
C	Control delay greater than 20 and up to 35 seconds per vehicle. Higher delays are caused by fair progression or longer cycle lengths or both. Individual cycle failures may begin to appear. Cycle failure occurs when a given green phase does not serve queued vehicles, and overflow occurs. The number of vehicles stopping is significant, though many still pass through the intersection without stopping.
D	Control delay greater than 35 and up to 55 seconds per vehicle. The influence of congestions becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volumes. Many vehicles stop, the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Control delay greater than 55 and up to 80 seconds per vehicle. The limit of acceptable delay. High delays usually indicate poor progression, long cycle lengths, and high volumes. Individual cycle failures are frequent.
F	Control delay in excess of 80 seconds per vehicle. Unacceptable to most drivers. Oversaturation, arrival flow rates exceed the capacity of the intersection. Many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to higher delay.

Source: Highway Capacity Manual 2000

Table 2: Level of Service Definitions for Stop-Controlled Intersections

Level of Service	Description
A	Very low control delay less than 10 seconds per vehicle for each movement subject to delay.
B	Low control delay greater than 10 and up to 15 seconds per vehicle for each movement subject to delay.
C	Acceptable control delay greater than 15 and up to 25 seconds per vehicle for each movement subject to delay.
D	Tolerable control delay greater than 25 and up to 35 seconds per vehicle for each movement subject to delay.
E	Limit of tolerable control delay greater than 35 and up to 50 seconds per vehicle for each movement subject to delay.
F	Unacceptable control delay exceeds 50 seconds per vehicle for each movement subject to delay.

Source: Highway Capacity Manual 2000

2.2 Significant Impact Criteria/Level of Service Standards

City of Daly City

According to the City's adopted General Plan, the level of service standard at all intersections is LOS D. Based on the General Plan LOS standard, the project would have a significant impact on traffic if the following conditions occur due to the addition of project traffic:

- The addition of project traffic degrades an intersection level of service to below LOS D during weekday morning and evening peak periods.

Caltrans

Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on all State highway facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. Level of service is based on appropriate measures of effectiveness (MOEs) determined by the type of facility. This project assumes target of LOS C for all state highway intersections. If an existing State highway facility is operating at less than the appropriate target LOS, the existing MOE should be maintained. Caltrans has jurisdiction over all intersections involving freeway ramps.

All study intersections are under City of Daly City jurisdiction, except for the intersection at Sullivan Avenue/Pierce Street (Intersection #3), which are under Caltrans jurisdiction.

3.0 EXISTING CONDITIONS

This section describes existing conditions in the immediate project site vicinity, including roadway facilities, bicycle and pedestrian facilities, and available transit service. In addition, existing traffic volumes and operations are presented for the study intersections, including the results of LOS calculations.

3.1 Existing Setting and Roadway System

Interstate 280 (I-280), and State Route (SR-1) serve Daly City. I-280 provides regional access between San Jose and San Francisco. SR-1 is a state freeway primarily providing north-south access along the coastline of California. Important roadways in the immediate vicinity of the project site follow:

Interstate 280 (I-280) is an eight- to twelve-lane freeway with a posted speed limit of 65 miles per hour. The north-south freeway connects Daly City with nearby cities, including San Francisco and San Bruno, and regional destinations, such as San Jose. It also provides access to the greater freeway network with direct connections to Interstates 680 and 880, US Highway 101, and State Routes 1, 92 and 85. Access to the project site from I-280 is provided via ramps at Sullivan Avenue.

State Route 1 (SR-1) is a four- to eight-lane freeway near the project with a posted speed limit of 65 miles per hour. The north-south freeway connects Daly City with nearby cities, such as San Francisco and Pacifica, and regional destinations along the coast.

Junipero Serra Boulevard is a four-lane, north-south roadway with a posted speed limit of 35 miles per hour near the project site. The facility extends from Daly City to South San Francisco. On-street parking is prohibited and a sidewalk is present along the east side of the street in the vicinity of the Project. Junipero Serra Boulevard has a designated Class II bike lane between D Street and the town limit for Colma.

Eastmoor Avenue is an east-west roadway extends from the study intersection of Eastmoor Avenue/Sullivan Avenue to Ocean Grove Avenue. Eastmoor Avenue is a two-lane collector roadway. Eastmoor Avenue allows on-street parking on both sides of the street. The posted speed limit is 25 mph. Access to the project site is proposed on this roadway.

Sullivan Avenue is a two-lane, north-south local collector roadway extending between Garden Lane in the north and Southgate Avenue in the south. The posted speed limit on Sullivan Avenue is 25 mph.

San Pedro Road is an east-west roadway extending from the study intersection of Eastmoor Avenue/Sullivan Avenue to Mission Street. San Pedro Road is a four-lane arterial roadway. San Pedro Road allows on-street parking on both sides of the street along select segments. The posted speed limit on San Pedro Road is 25 mph.

Pierce Street is an east-west local collector roadway extends between the I-280 SB Off-Ramp in the east and Annie Street in the west. Pierce Street is a two-lane roadway with a posted speed limit of 25 mph.

3.2 Existing Pedestrian Facilities

Walkability is the ability to travel easily and safely between various origins and destinations without relying on automobiles or other motorized travel. The ideal "walkable" community includes wide sidewalks, a mix of land uses such as residential, employment, and shopping opportunities, a limited number of conflict points with vehicle traffic, and easy access to transit facilities and services.

Pedestrian facilities are comprised of crosswalks, sidewalks, pedestrian signals, and off-street paths, which provide safe and convenient routes for pedestrians to access the destinations such as institutions, businesses, public transportation, and recreation facilities.

In the immediate project vicinity, roadways provide sidewalks on one or both sides of road. There is no sidewalk connection on east side of Sullivan Avenue between San Pedro Road and Pierce Street.

ADA-compliant curb ramps connect sidewalks at all study intersections with the exception of some approach legs. Crosswalks are present at some legs of all study intersections, except for the intersection at Sullivan Avenue/I-280 SB On-Ramp. Intersections provide pedestrian signals and push buttons (PPB) where crosswalks are present. The project vicinity has adequate pedestrian facilities that provide access to nearby transit stops and the Colma BART Station, which is approximately 0.5 mile east of the project site.

3.3 Existing Bicycle Facilities

Bicycle facilities are defined by the following three classes:

- Class I – Provides a completely separated facility designed for the exclusive use of bicyclists and pedestrians with crossing points minimized.
- Class II – Provides a restricted right-of-way designated lane for the exclusive or semi-exclusive use of bicycles with through travel by motor vehicles or pedestrians prohibited, but with vehicle, parking and cross-flows by pedestrians and motorists permitted.
- Class III – Provides a right-of-way designated by signs or permanent markings and shared with pedestrians and motorists.

Based on the Daly City Bicycle and Pedestrian Master Plan (2013) and the Daly City 2030 General Plan, bicycle facilities are not present in the project vicinity. Design of Class II bike lanes along Eastmoor Avenue between Ocean Grove Avenue and Sullivan Avenue, and Class III bike routes along Junipero Serra Boulevard are currently in progress.

3.4 Existing Transit Facilities

The San Mateo County Transit District (SamTrans) and the Bay Area Rapid Transit system (BART) serve Daly City with a well-developed transit system that includes bus and rail services. Descriptions of the nearby transit services are in **Table 3** below.

SamTrans

SamTrans provides the principal bus service in San Mateo County. It operates local and school buses, as well as express routes to San Francisco. It is also a service provider for paratransit. All buses are equipped with front-loading racks with a capacity of two bicycles. SamTrans operates seven routes that directly serve the

project through an on-site bus stop. Three routes provide local service (Routes 24, 121, 122). Route 122 serves the Colma BART station while Route 121 serves both the Daly City and Colma BART stations. Route 24 provides service between Daly City, San Francisco, and Brisbane on school days only.

BART

Bay Area Rapid Transit (BART) provides heavy-rail, regional transit service to Alameda, San Francisco, Contra Costa, and San Mateo counties. The nearest station is the Colma BART Station, located approximately 0.5 miles from the Project site. BART's direct service from this station includes the Pittsburg-Baypoint line and the Richmond-Daly City/Millbrae line.

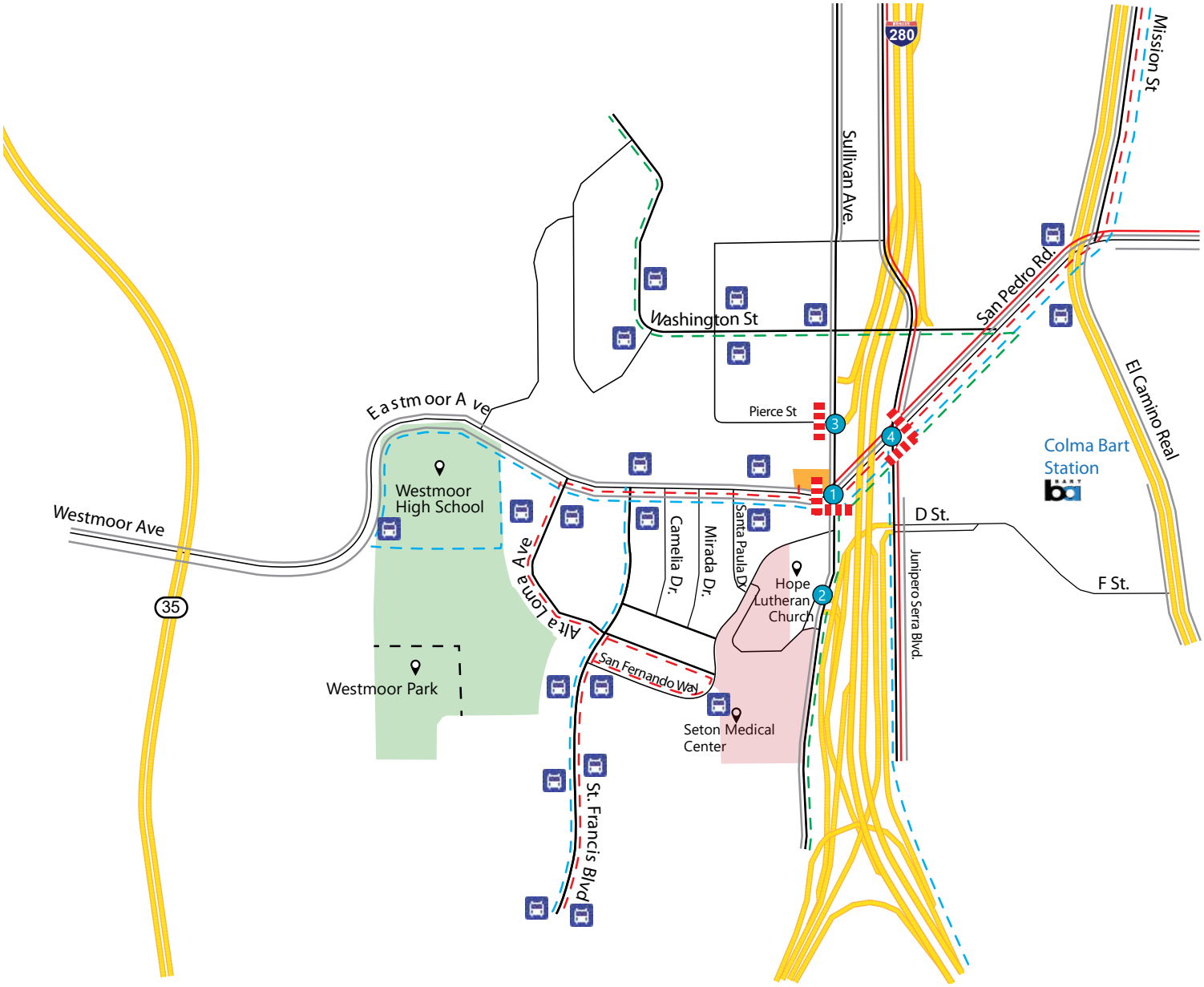
Table 3: Existing Transit Services

Route	From	To	Weekdays		Weekends	
			Operating Hours	Headway (minutes)	Operating Hours	Headway (minutes)
24	Old County/San Francisco	Summit Shasta High School	7:05 a.m. – 7:52 a.m. & 3:30 p.m. – 4:20 p.m.	-	-	-
121	Skyline College	Pope/Bellevue	5:40 a.m. – 11:14 p.m.	30-40	7:27 a.m. – 10:38 p.m.	60
122	San Francisco BART	Stonestown/SF State	5:15 a.m. – 11:15 p.m.	15-30	8:00 a.m. – 11:35 p.m.	30-60
BART Line	Pittsburg/Bay Point	SFO/Millbrae	4:00 a.m.- Midnight	15-20	6:00 a.m.- Midnight	20
BART Line	Richmond-Daly City	Millbrae	4:00 a.m.- Midnight	15-20	6:00 a.m.- Midnight	20

Source: http://www.samtrans.com/; www.bart.gov

Figure 3 illustrates existing pedestrian, bicycle, and transit facilities in the study area.

Figure 3: Existing Pedestrian, Bicycle & Transit Facilities



LEGEND

- Project Site
- Study Intersection
- Project Driveway
- Sam Trans Route 122
- Sam Trans Route 121
- Sam Trans Route 24
- Bus Stop
- Crosswalk
- Sidewalks
- Class II Bike Route

3.5 Existing Peak Hour Traffic Volumes and Lane Configurations

Under Existing Conditions, evaluation of study intersections were for the highest one-hour volumes during weekday morning and evening peak periods. TJKM has conducted turning movement counts for vehicles, bicycles, and pedestrians during typical weekday day a.m. (7:00-9:00 a.m.) and p.m. peak periods (4:00-6:00 p.m.) at the study intersections, in October 2019. **Appendix B** includes all of the data sheets for the vehicle, bicycle, and pedestrian counts. **Figure 4** displays the existing lane geometry and traffic controls at the study intersections.

3.6 Intersection Level of Service Analysis – Existing Conditions

The peak hour traffic volumes at the study intersections are shown in **Figure 5**. The City provided current signal timing sheets at the study intersections. **Table 4** summarizes the results of the LOS analysis using the Synchro 10 software program for Existing Conditions.

Under Existing Conditions, all study intersections operate at acceptable LOS C and D or better during both a.m. and p.m. peak hours. **Appendix C** contains detailed LOS calculation sheets for this scenario**.**

Table 4: Intersection Level of Service Analysis – Existing Conditions

#	Study Intersections	Control	Peak Hour[1]	Existing Conditions	
				Average Delay[2]	LOS[3]
1	Eastmoor Avenue/Sullivan Avenue	Signal	AM	28.8	C
			PM	23.8	C
2	Sullivan Avenue/I-280 SB On-Ramp	Signal	AM	14.1	B
			PM	14.2	B
3	Sullivan Avenue/Pierce Street[4]	Signal	AM	14.1	B
			PM	14.6	B
4	San Pedro Road/Junipero Serra Boulevard	Signal	AM	49.3	D
			PM	46.4	D

Notes:

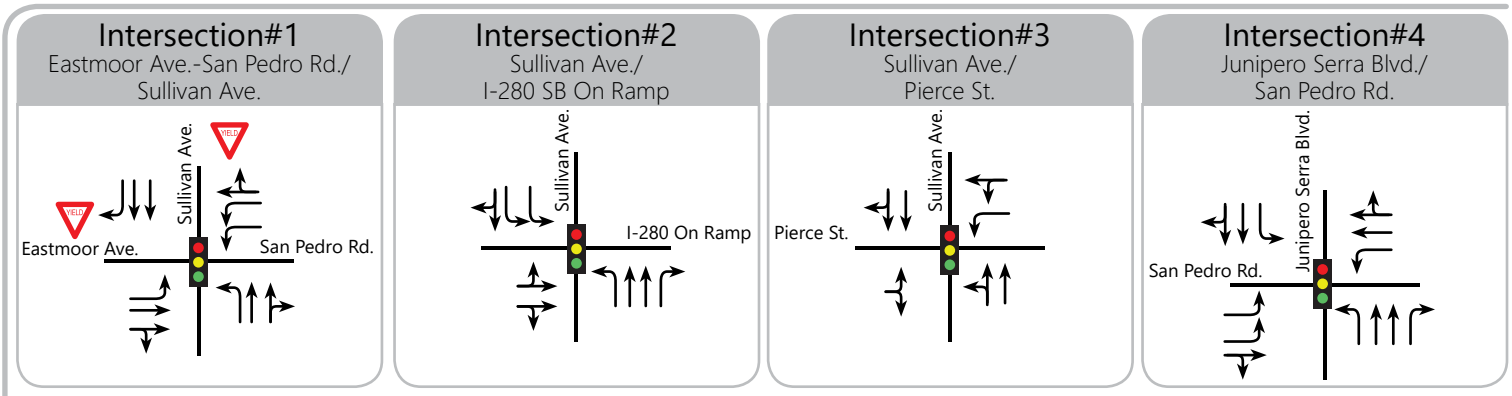
[1] AM – morning peak hour, PM – evening peak hour.

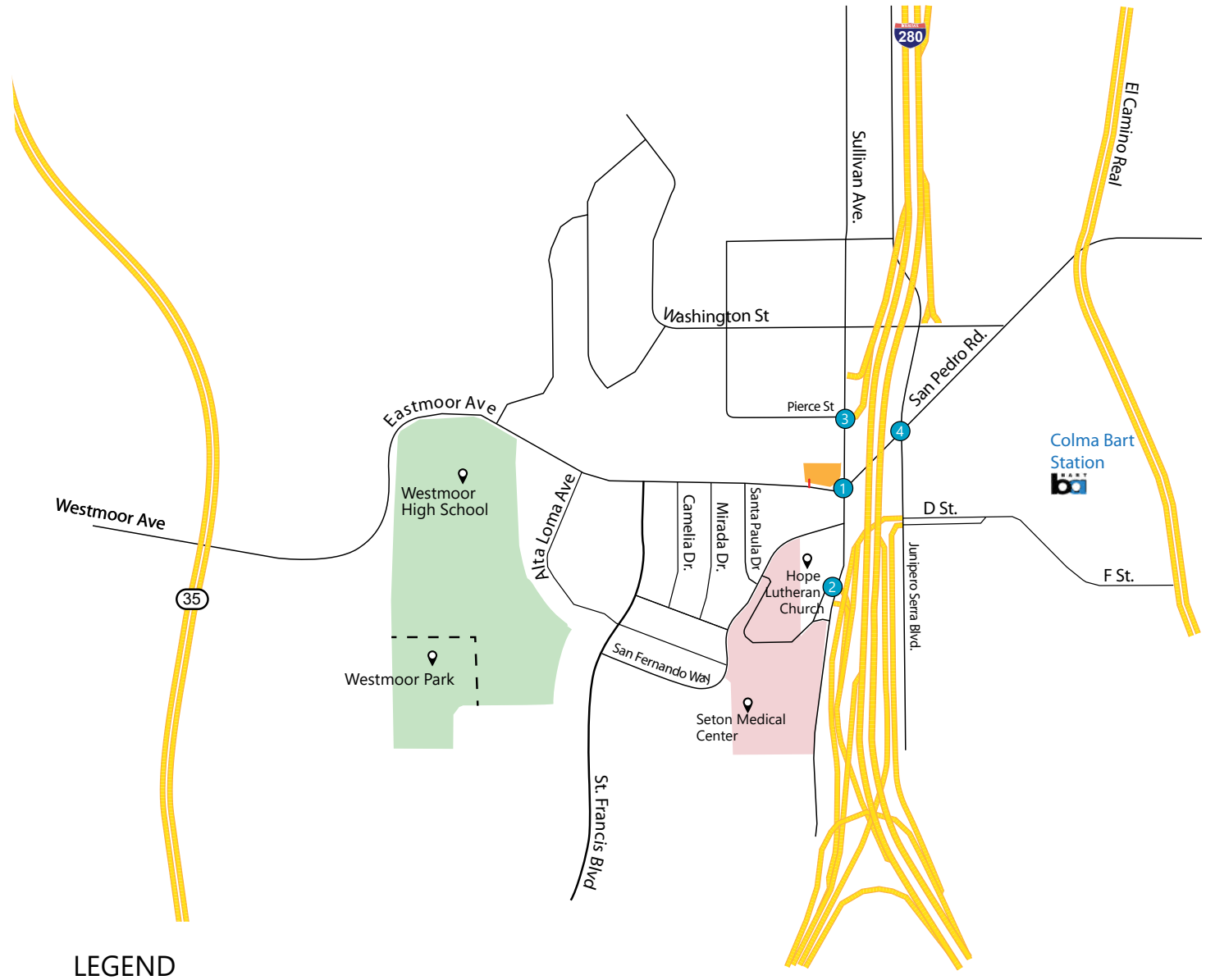
[2] Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized intersections.

[3] LOS – Level of Service.

[4]Intersection operated under Caltrans jurisdiction.

Figure 4: Existing Lane Geometry & Traffic Controls



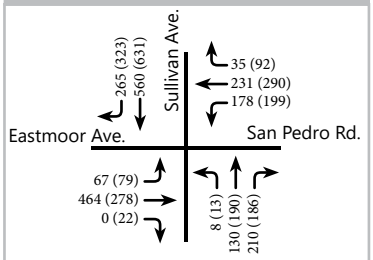


LEGEND

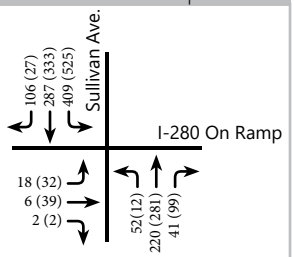
- Project Site
- Study Intersection
- Project Driveway
- Traffic Signal
- Yield Controls

Figure 5: Existing Peak Hour Volumes

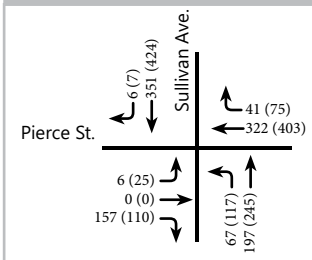
Intersection#1
Eastmoor Ave.-San Pedro Rd./
Sullivan Ave.



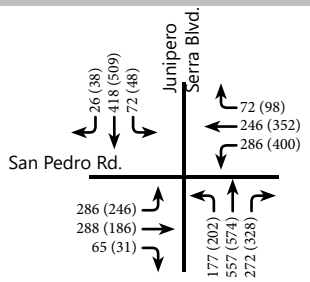
Intersection#2
Sullivan Ave./
I-280 SB On Ramp

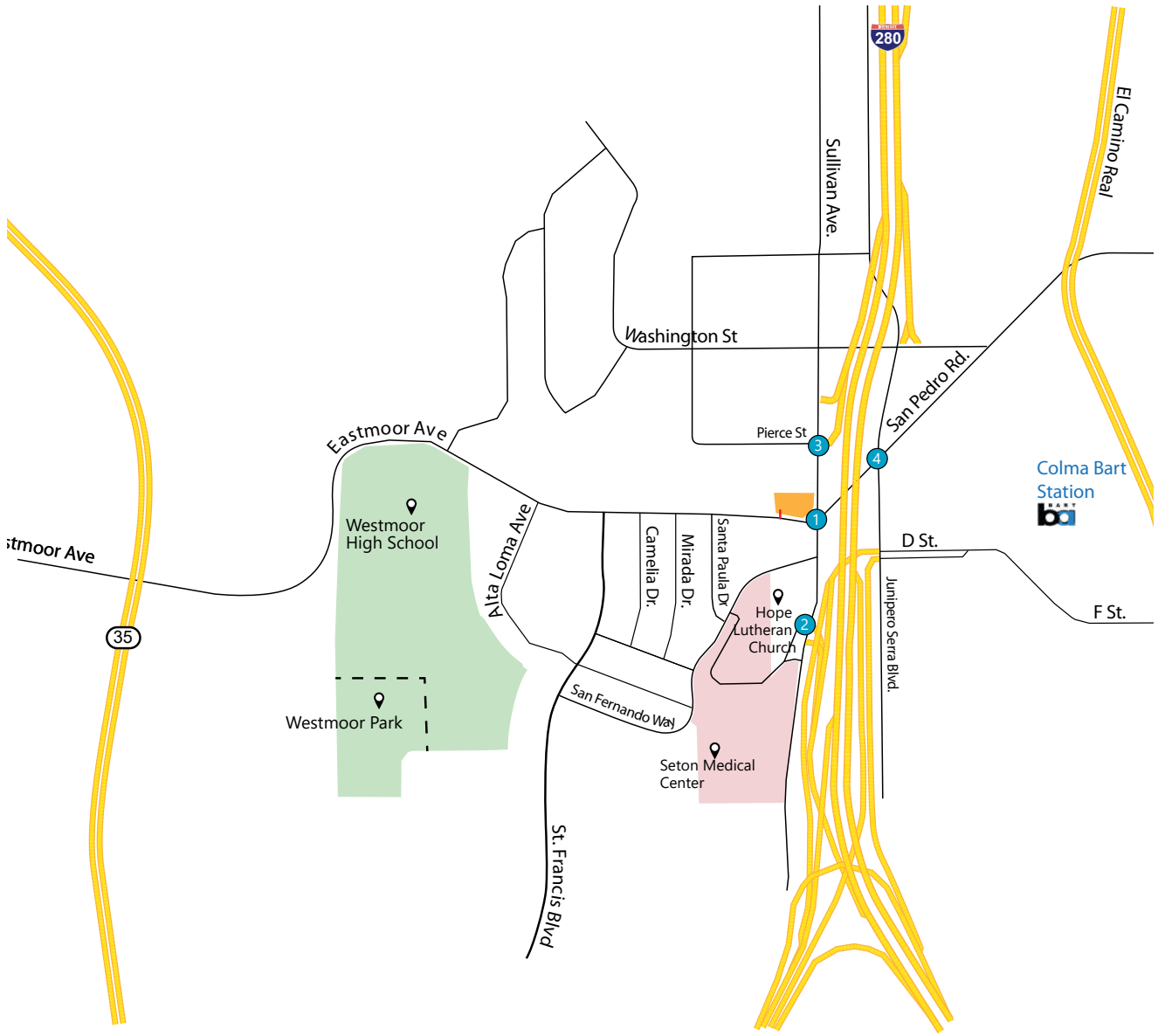


Intersection#3
Sullivan Ave./
Pierce St.



Intersection#4
Junipero Serra Blvd./
San Pedro Rd.





LEGEND

- Project Site
- X Study Intersection
- Project Driveway
- XX AM Peak Hour Volume
- (XX) PM Peak Hour Volume

4.0 EXISTING PLUS PROJECT CONDITIONS

This analysis scenario presents the impacts of the proposed development at the study intersections and surrounding roadway system. This scenario is similar to Existing Conditions, but with the addition of traffic from the proposed project.

4.1 Project Description

The project site is located at 493 Eastmoor Avenue, west of San Pedro Road as shown in **Figure 1**.The project proposes to construct a 7-story building to accommodate 72 units of affordable housing and 1,196 s.f. of commercial/office development at the northwest corner of Eastmoor Avenue and Sullivan Avenue. The development consists of 35 studio, 36 one-bedroom, and one two-bedroom units. The existing site is currently vacant. Eastmoor Avenue will provide access to the project site via one full-access driveway.

4.2 Project Trip Generation

TJKM estimated the project trip generation for the proposed project based on the published trip generation rates from the ITE publication Trip Generation, 10th Edition (2017). TJKM used published trip rates for the ITE land use Multifamily Housing – Mid-Rise (ITE Code 221) and office building (ITE Code 710), as these land uses most closely match the trip characteristics of the proposed development.

This analysis reduces the ITE-based trip generation by 22 percent to account for non-automobile trips, per the Daly City 2030 General Plan Circulation Element (refer page no. 128 of document).

Table 5 shows the expected trips generated by the proposed project. The proposed project expects to generate 315 daily net trips, including 21 a.m. peak hour net trips (6 inbound trips, 15 outbound trips) and 26 p.m. peak hour trips (16 inbound trips, 10 outbound trips).

Table 5: Project Trip Generation

Land Use	Size	Daily		AM Peak					PM Peak				
		Rate	Trips	Rate	In: Out	In	Out	Total	Rate	In: Out	In	Out	Total
Proposed Facility													
Multifamily Housing (Mid-Rise) (ITE Code 221)[1]	72 d.u.	5.44	392	0.36	*26: 74*	7	19	26	*0.44*	*61: 39*	20	12	32
General Office Building (ITE Code 710)[2]	1.196 k.s.f	9.74	12	1.16	*86: 14*	1	0	1	1.15	*16: 84*	0	1	1
Subtotal			404			8	19	27			20	13	33
Reduction (22%): Public Transit, Bike,Walk,Other[3]			89			*-2*	*-4*	*-6*			*-4*	*-3*	*-7*
Total Trips			**315**			**6**	**15**	**21**			**16**	**10**	**26**

Notes:
Source: ITE *Trip Generation Manual, 10th Edition*, 2017
d.u-Dwelling Units;k.s.f-One Thousand Square Feet
[1]Multifamily Housing (ITE Land Use Code 221) vehicle trip rates are based upon number of dwelling units.
[2]General Office Building (ITE Land Use Code 710) vehicle trip rates are based upon number of thousand square feet gross floor area.
[3]Reduction of 22% assumed, based on Daly City 2030 General Plan, Circulation Element (Page 128): Public Transit, Bike,Walk and Other.

4.2 Project Trip Distribution and Assignment

Trip distribution is a process that determines in what proportion vehicles will travel between the project site and various destinations outside the project study area. Assignment determines the various routes that vehicles would take from the project site to each destination using the estimated trip distribution.

The existing travel patterns and TJKM's knowledge of the study area developed the trip distribution assumptions for the proposed project.

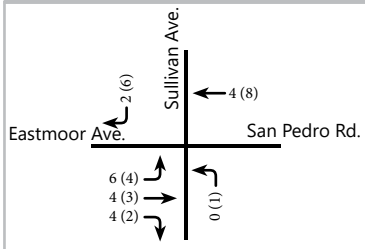
The distribution assumptions are as follows**:**

- 25 percent to/from I-280 to the north
- 20 percent to/from I-280 to the south
- 10 percent to/from El Camino Real to the south
- 10 percent to/from Mission Street to the north
- 10 percent to/from E. Market Street to the east
- 10 percent to/from Eastmoor Avenue to the west
- 5 percent to/from Sullivan Avenue to the north
- 5 percent to/from Sullivan Avenue to the south
- 5 percent to/from Washington Street to the north

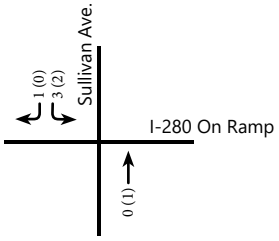
Figure 6 illustrates the trip distribution percentages and assigned project trips developed for the proposed project. The addition of assigned project trips and traffic volumes under Existing Conditions generate Existing plus Project Conditions traffic volumes.

Figure 6: Trip Distribution and Assignment

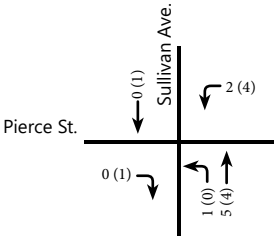
Intersection#1
Eastmoor Ave.-San Pedro Rd./
Sullivan Ave.



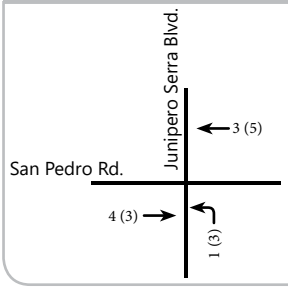
Intersection#2
Sullivan Ave./
I-280 SB On Ramp



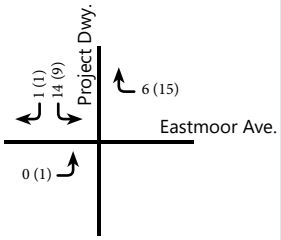
Intersection#3
Sullivan Ave./
Pierce St.



Intersection#4
Junipero Serra Blvd./
San Pedro Rd.



Intersection
Eastmoor Ave./
Project Driveway



LEGEND

- Project Site
- X Study Intersection
- Project Driveway
- % Proposed Trip Distribution
- XX AM Peak Hour Project Trips
- (XX) PM Peak Hour Project Trips

4.3 Intersection Level of Service Analysis – Existing plus Project Conditions

Figure 7 shows projected turning movement volumes at the study intersections for Existing plus Project Conditions. **Table 6** summarizes the intersection LOS analysis results for Existing plus Project Conditions. The results for Existing Conditions are included for comparison purposes, along with the projected increases in control delay.

Under Existing plus Project conditions, all study intersections operate at acceptable LOS D or better during both a.m. and p.m. peak hours. Detailed calculation sheets for Existing plus Project Conditions are contained in **Appendix D**.

Table 6: Intersection Level of Service Analysis – Existing plus Project Conditions

#	Study Intersections	Control	Peak Hour[1]	Existing Conditions		Existing plus Project Conditions		
				Average Delay[2]	LOS[3]	Average Delay[2]	LOS[3]	Change in Delay[4]
1	Eastmoor Avenue/Sullivan Avenue	Signal	AM	28.8	C	29.1	C	0.3
			PM	23.8	C	24.2	C	0.4
2	Sullivan Avenue/I-280 SB On-Ramp	Signal	AM	14.1	B	14.1	B	0.0
			PM	14.2	B	14.2	B	0.0
3	Sullivan Avenue/Pierce Street	Signal	AM	14.1	B	14.1	B	0.0
			PM	14.6	B	14.6	B	0.0
4	San Pedro Road/Junipero Serra Boulevard	Signal	AM	49.3	D	49.4	D	0.1
			PM	46.4	D	46.7	D	0.3
5	Eastmoor Avenue/Project Driveway	One-Way Stop	AM	-	-	22.8	C	22.8
			PM	-	-	21.9	C	21.9

Notes:

[1] AM – morning peak hour, PM – evening peak hour

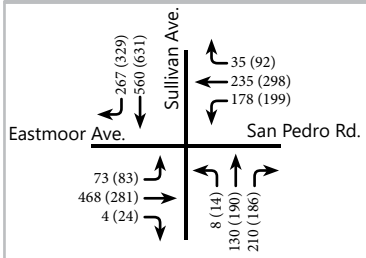
[2] Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized intersections.

[3] LOS – Level of Service

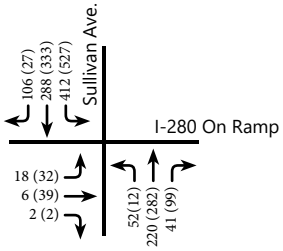
[4]Change in average delay between Existing and Existing plus Project Conditions

Figure 7: Existing Plus Project Peak Hour Traffic Volumes

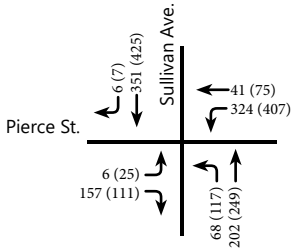
Intersection#1
Eastmoor Ave.-San Pedro Rd./
Sullivan Ave.



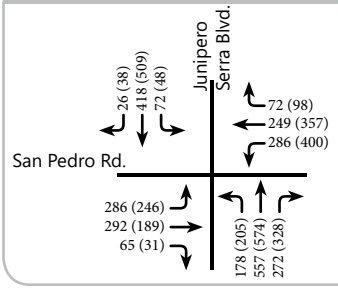
Intersection#2
Sullivan Ave./
I-280 SB On Ramp



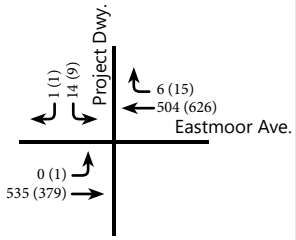
Intersection#3
Sullivan Ave./
Pierce St.



Intersection#4
Junipero Serra Blvd./
San Pedro Rd.



Intersection
Eastmoor Ave./
Project Driveway



LEGEND

- Project Site
- X Study Intersection
- Project Driveway
- XX AM Peak Hour Volume
- (XX) PM Peak Hour Volume

5.0 ADDITIONAL ANALYSIS

The following sections provide additional analyses of other transportation issues associated with the project site, including:

- Site access and onsite circulation;
- Parking analysis;
- Queueing and Driveway analysis;
- Pedestrian, bicycle and transit access and impacts; and
- Vehicle Miles Traveled

The analyses in these sections are based on professional judgment in accordance with the standards and methods employed by traffic engineers. Although operational issues are not considered CEQA impacts, they do describe traffic conditions that are relevant to describing the project environment.

5.1 Site Access and On-Site Circulation

This section analyzes site access and internal circulation for vehicles, pedestrians, and bicycles. TJKM reviewed internal and external access for the project site for vehicles, pedestrians, and bicycles and on-site vehicle circulation. Site access would be provided from Eastmoor Avenue via one 22-foot driveway located west of Eastmoor Avenue. This driveway will also provide emergency access to the project site. The driveway on Eastmoor Avenue would be located approximately 100 feet from the intersection of Eastmoor Avenue/Sullivan Avenue. The driving aisles are 24 to 25 feet wide, and will adequately accommodate two-way circulation on the project site. The sidewalks are considered adequate with a continuous pedestrian path of travel from the sidewalk to the building's lobby accommodate pedestrian access to the project site. Additionally, a clear pedestrian pathway provides pedestrian access from the handicap parking spaces into the parking garage to the building's lobby. The parking garage will have designated bicycle areas and will accommodate bicycle access to the project site. The trash enclosure, located on the western side of the property, provides access for garbage and delivery trucks. Emergency vehicles have ample space to access and circulate the project site. Vehicle and truck site access and on-circulation are adequate. Gate is located inside the garage. A car will first enter the garage and travel for 19 feet and then make a right and go for another 19 feet before hitting the gate. Location of gates have enough space and does not have any impact on vehicular queues within the property.

5.2 Parking Analysis

Based on the project site plan (Figure 2), 32 vehicle parking spaces are provided, including two accessible parking spaces and three electric vehicle parking spaces. The site plan features a bicycle parking area on the east side of the property.

The City's 2030 General Plan identifies multiple parking reduction opportunities for mixed-use developments. Additionally, the General Plan allows for further parking reductions for larger residential developments, of 50 or more units, located within 0.5-mile distance to a BART station, and developments

that will deed-restrict a minimum of 20 percent of residential units to extremely low-income households for reduced parking requirement of 0.5 parking spaces per unit.

According to AB 744, if a development consists solely of rental units, exclusive of a manger's unit, with an "affordable housing cost to lower income families" as provided in the Health and Safety Code; the development is located within one-half mile of a major transit stop as defined in the Public Resources Code; and there is unobstructed access to the major transit stop from the development, then the parking ratio for that development must not exceed 0.5 spaces per unit. For professional office developments under 20,000 square feet (s.f.) one parking space is required per 300 s.f. of gross floor area. The proposed mixed-use development has 1,196 s.f. of office space and 72 residential dwelling units. The project would be required to provide 32 total parking spaces of which 28 reserved for residential use and four for office use. A summary of the parking demand estimate for the project is shown in **Table 7**.

Table 7: Parking Generation and Requirements

Land Use Category	Size		Parking Required
Affordable Residential Units	72	Dwelling Unit	(0.5 (PER AB744)*72) =36
Commercial/Office space	1,196	Square feet	1,196/300=4
20% Reduction in Parking allowed for mixed-use development projects pursuant to Section 17.34.010.E of the Daly City Code			0.8 (36+4) =32
Parking Spaces provided by the Project			**32**

5.3 Queuing and Driveway Analysis

Queuing Analysis at Study Intersections

TJKM conducted a vehicle queuing and storage analysis for all exclusive left turn or right-turn pockets at the study intersections that experience added project traffic under Existing plus Project Conditions. The HCM 2000 Queue methodology contained in Synchro software analyzed the 95th percentile (maximum) queues. Detailed calculations are included in the LOS appendices corresponding to each analysis scenario. **Table 8** summarizes the 95th percentile queue lengths at the study intersections under Existing and Existing plus Project Conditions scenarios. The proposed project increases queue lengths by a maximum of 10 feet, which is less than a single car length (25 feet). There is no significant impact to the queuing at the project study intersections.

Table 8: 95th Percentile Queues at Turn Pockets Affected by Project Traffic

#	Intersection	Lane Group	Storage Length per Lane	Existing Conditions		Existing plus Project Conditions		Change	
				AM	PM	AM	PM	AM	PM
1	Eastmoor Avenue/Sullivan Avenue	EBL	80	**100**	**85**	**103**	**88**	3	3
		WBL	210	85	85	85	84	0	-1
		WBTR	80	**305**	**320**	**307**	**330**	2	10
		NBL	95	25	25	23	26	-2	1
2	Sullivan Avenue/I-280 SB On-Ramp	EBTL	100	15	30	12	30	-3	0
		NBL	100	50	20	47	18	-3	-2
		NBR	100	5	25	5	21	0	-4
		SBL	155	115	**180**	113	**178**	-2	-2
3	Sullivan Avenue/Pierce Street	WBL	290	115	150	113	148	-2	-2
4	San Pedro Road/Junipero Serra Boulevard	EBL	210	170	190	167	188	-3	-2
		WBL	90	**305**	**715**	301	**718**	-4	3
		NBL	275	230	**300**	**232**	**304**	2	4
		NBR	275	60	70	58	69	-2	-1
		SBL	250	105	105	102	104	-3	-1

Notes: Storage length and 95th percentile queue expressed in feet per lane
Bold indicates overflow
1 vehicle = 25 feet

Queuing Analysis at Project Driveway

TJKM conducted a vehicle queuing analysis at the proposed project driveway on Eastmoor Avenue. The HCM 2000 Queue methodology contained in Synchro software analyzed 95th percentile (maximum) queues for the project driveway. **Table 9** summarizes the 95th percentile queue lengths at the project driveway under Existing plus Project scenario. Under Existing plus Project Conditions, the project anticipates 95th percentile queues at the outbound approach of project driveway of less than one vehicle length (25 feet).

Table 9: 95th Percentile Queues at Project Driveways

Intersection	Control	Lane Group	Existing plus Project Conditions AM 95th Percentile Queue (ft)[1]	Existing plus Project Conditions PM 95th Percentile Queue (ft)[1]
Eastmoor Avenue/Project Driveway	One-Way Stop	EBL	<25	<25
		WBR	<25	<25

Notes: [1]Reported values of 95th percentile queues are for the outbound movements at the project driveway.
1 vehicle = 25 feet.

5.4 Pedestrian, Bicycle, and Transit Impacts

Pedestrian Impacts

An impact to pedestrians occurs if the proposed project disrupts existing pedestrian's facilities; or creates inconsistencies with planned pedestrian facilities or adopted pedestrian system plans, guidelines, policies, or standards. The project may produce a moderate amount of pedestrian trips, accommodated by existing pedestrian facilities. The project does not expect to provide any disruptions or inconsistencies with pedestrian facilities or plans. Therefore, the impact to pedestrian facilities is **less-than-significant**.

Bicycle Impacts

An impact to bicyclists occurs if the proposed project disrupts existing bicycle facilities; or creates inconsistencies with planned bicycle facilities or adopted bicycle system plans, guidelines, policies, or standards. The proposed project will have adequate bicycle access to the project site from the surrounding area via existing, in-progress and proposed bicycle facilities, and does not expect to create any inconsistencies with bicycle facilities or plans. Therefore, the impact to bicycle facilities is **less-than-significant**.

Transit Impacts

A proposed project has a significant impact on transit facilities if it conflicts with existing or planned transit facilities, or expects to generate additional transit trips and does not provide adequate facilities for pedestrians and bicyclists to access transit routes and stops. Pedestrians and bicyclists can access the closest transit stops, shown in **Figure 3**, via a continuous path of sidewalks and existing and planned bicycle facilities. The transit service within the immediate project site operates within capacity, and existing bus and rail services would accommodate additional trips generated by the proposed project. Therefore, impacts to transit service are expected to be **less-than-significant**.

5.5 Vehicle Miles Traveled

Compliance with Senate Bill (SB) 743 will include replacement of LOS with vehicle miles traveled (VMT) for purposes of assessing traffic impacts under CEQA. Regulatory details have not yet been finalized, and most jurisdictions, including the City of Daly City, do not yet have an adopted VMT threshold. This is reflected on the Caltrans website (http://www.dot.ca.gov/hq/tpp/sb743.html) which notes that "*It is anticipated that regulatory language changes to CEQA will be adopted in late 2017 by the Natural Resources Agency and that statewide implementation will occur in late 2019.*" It is anticipated that VMT impacts for residential projects will be based on VMT per capita (based on residential population), while VMT impacts for commercial

projects will be based on VMT per employee. It is anticipated that VMT impacts would be considered less than significant if a project were to generate VMT per capita (or VMT per employee) at a rate 15 percent below the regional average. While each city will be responsible for adopting their own regional threshold, it is anticipated that Bay Area cities will likely base their VMT thresholds on nine-county averages.

The proposed project is likely to generate VMT at a rate that is more than 15 percent below the nine-county Bay Area average. The project is unlikely to result in VMT impacts based on the VMT regional thresholds, because:

- The proposed project will provide housing in a segment of the Bay Area that has a surplus of jobs relative to the supply of housing. The large supply of jobs in San Francisco and other neighboring cities results in relatively long commute lengths for many employees, particularly those commuting from homes in the East Bay and San Francisco. By contrast: the provision of housing in Daly City will help to reduce VMT at a regional level, by providing homes closer to job locations.
- The commercial portion of the development will consist of a relatively small-scale commercial space, that will most likely serve local customers as well as serving pass-by trips on Eastmoor Avenue.

CONCLUSIONS AND RECOMMENDATIONS

Project Trip Generation

The proposed development project expects to generate 315 net daily trips, with 21 trips occuring during the a.m. peak hour and 26 trips occuring during the p.m. peak hour.

Existing Conditions

Under this scenario, all study intersections operate at an acceptable LOS C and D or better during both a.m. and p.m. peak hours.

Existing plus Project Conditions

Under this scenario, all study intersections are expected to continue to operate at acceptable LOS C and D or better. Based on the City of Daly City and Caltrans Guideline thresholds impact criteria, the project expects to have **less-than-significant** impacts at all the study intersections under Existing plus Project Conditions.

Site Access and On-Site Circulation

Access to the proposed project would be via one driveway on Eastmoor Avenue. Pedestrian access is acceptable, including sidewalks, signalized pedestrian crossings, and nearby transit services. Bicycle access is minimal, but will improve with in-progress and future planned facilities. Site access and circulation are **adequate**.

Parking

The project site plan (Figure 2) show a supply of 32 parking spaces, including two accessible spaces and three electric vehicle stations. Based on City zoning code requirements, the number of proposed parking spaces are sufficent.

Queuing and Driveway Analysis

The proposed project creates a **less-than-significant** impact to the expected left-turn or right-turn queues at the study intersections. The project expects the driveway to operate at an acceptable LOS and the 95th percentile queueing at the outbound approach to be less than one vehicles length during both peak periods.

Pedestrian, Bicycle and Transit Impacts

The proposed project does not conflict with existing and planned pedestrian or bicycle facilities. The project expects to add a moderate amount of trips to existing transit facilities, which the existing transit capacity can accommodate. Therefore, the impact to pedestrian, bicycle, and transit facilities is **less-than-significant.**

Appendix A – Level of Service Methodology

LEVEL OF SERVICE METHODOLOGY

LEVEL OF SERVICE

The description and procedures for calculating capacity and level of service are found in Transportation Research Board, *Highway Capacity Manual 2000*. *Highway Capacity Manual 2000* represents the latest research on capacity and quality of service for transportation facilities.

Quality of service requires quantitative measures to characterize operational conditions within a traffic stream. Level of service is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience.

Six levels of service are defined for each type of facility that has analysis procedures available. Letters designate each level, from A to F, with level-of-service A representing the best operating conditions and level-of-service F the worst. Each level of service represents a range of operating conditions and the driver's perception of these conditions. Safety is not included in the measures that establish service levels.

A general description of service levels for various types of facilities is shown in Table A-I.

Table A-I

Level of Service Description

Facility Type	**Uninterrupted Flow**	**Interrupted Flow**
	Freeways Multi-lane Highways Two-lane Highways Urban Streets	Signalized Intersections Unsignalized Intersections Two-way Stop Control All-way Stop Control
LOS		
A	Free-flow	Very low delay.
B	Stable flow. Presence of other users noticeable.	Low delay.
C	Stable flow. Comfort and convenience starts to decline.	Acceptable delay.
D	High density stable flow.	Tolerable delay.
E	Unstable flow.	Limit of acceptable delay.
F	Forced or breakdown flow.	Unacceptable delay

Source: *Highway Capacity Manual 2000*

Urban Streets

The term "urban streets" refers to urban arterials and collectors, including those in downtown areas.

Arterial streets are roads that primarily serve longer through trips. However, providing access to abutting commercial and residential land uses is also an important function of arterials.

Collector streets provide both land access and traffic circulation within residential, commercial and industrial areas. Their access function is more important than that of arterials, and unlike arterials their operation is not always dominated by traffic signals.

Downtown streets are signalized facilities that often resemble arterials. They not only move through traffic but also provide access to local businesses for passenger cars, transit buses, and trucks. Pedestrian conflicts and lane obstructions created by stopping or standing buses, trucks and parking vehicles that cause turbulence in the traffic flow are typical of downtown streets.

The speed of vehicles on urban streets is influenced by three main factors, street environment, interaction among vehicles and traffic control. As a result, these factors also affect quality of service.

The street environment includes the geometric characteristics of the facility, the character of roadside activity and adjacent land uses. Thus, the environment reflects the number and width of lanes, type of median, driveway density, spacing between signalized intersections, existence of parking, level of pedestrian activity and speed limit.

The interaction among vehicles is determined by traffic density, the proportion of trucks and buses, and turning movements. This interaction affects the operation of vehicles at intersections and, to a lesser extent, between signals.

Traffic control (including signals and signs) forces a portion of all vehicles to slow or stop. The delays and speed changes caused by traffic control devices reduce vehicle speeds, however, such controls are needed to establish right-of-way.

The average travel speed for through vehicles along an urban street is the determinant of the operating level of service. The travel speed along a segment, section or entire length of an urban street is dependent on the running speed between signalized intersections and the amount of control delay incurred at signalized intersections.

Level-of-service A describes primarily free-flow operations. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at signalized intersections is minimal.

Level-of-service B describes reasonably unimpeded operations. The ability to maneuver within the traffic stream is only slightly restricted, and control delays at signalized intersections are not significant.

Level-of-service C describes stable operations, however, ability to maneuver and change lanes in midblock location may be more restricted than at level-of-service B. Longer queues, adverse signal coordination, or both may contribute to lower travel speeds.

Level-of-service D borders on a range in which in which small increases in flow may cause substantial increases in delay and decreases in travel speed. Level-of-service D may be due to adverse signal progression, inappropriate signal timing, high volumes, or a combination of these factors.

Level-of-service E is characterized by significant delays and lower travel speeds. Such operations are caused by a combination of adverse progression, high signal density, high volumes, extensive delays at critical intersections, and inappropriate signal timing.

Level-of-service F is characterized by urban street flow at extremely low speeds. Intersection congestion is likely at critical signalized locations, with high delays, high volumes, and extensive queuing.

The methodology to determine level of service stratifies urban streets into four classifications. The classifications are complex, and are related to functional and design categories. Table A-II describes the functional and design categories, while Table A-III relates these to the urban street classification.

Once classified, the urban street is divided into segments for analysis. An urban street segment is a one-way section of street encompassing a series of blocks or links terminating at a signalized intersection. Adjacent segments of urban streets may be combined to form larger street sections, provided that the segments have similar demand flows and characteristics.

Levels of service are related to the average travel speed of vehicles along the urban street segment or section.

Travel times for existing conditions are obtained by field measurements. The maximum-car technique is used. The vehicle is driven at the posted speed limit unless impeded by actual traffic conditions. In the maximum-car technique, a safe level of vehicular operation is maintained by observing proper following distances and by changing speeds at reasonable rates of acceleration and deceleration. The maximum-car technique provides the best base for measuring traffic performance.

An observer records the travel time and locations and duration of delay. The beginning and ending points are the centers of intersections. Delays include times waiting in queues at signalized intersections. The travel speed is determined by dividing the length of the segment by the travel time. Once the travel speed on the arterial is determined, the level of service is found by comparing the speed to the criteria in Table A-IV. Level-of-service criteria vary for the different classifications of urban street, reflecting differences in driver expectations.

Table A-II

Functional and Design Categories for Urban Streets

Criterion	Functional Category	
	Principal Arterial	**Minor Arterial**
Mobility function	Very important	Important
Access function	Very minor	Substantial
Points connected	Freeways, important activity centers, major traffic generators	Principal arterials
Predominant trips served	Relatively long trips between major points and through trips entering, leaving, and passing through city	Trips of moderate length within relatively small geographical areas

Criterion	Design Category			
	High-Speed	**Suburban**	**Intermediate**	**Urban**
Driveway access density	Very low density	Low density	Moderate density	High density
Arterial type	Multilane divided; undivided or two-lane with shoulders	Multilane divided: undivided or two-lane with shoulders	Multilane divided or undivided; one way, two lane	Undivided one way; two way, two or more lanes
Parking	No	No	Some	Usually
Separate left-turn lanes	Yes	Yes	Usually	Some
Signals per mile	0.5 to 2	1 to 5	4 to 10	6 to 12
Speed limits	45 to 55 mph	40 to 45 mph	30 to 40 mph	25 to 35 mph
Pedestrian activity	Very little	Little	Some	Usually
Roadside development	Low density	Low to medium density	Medium to moderate density	High density

Source: *Highway Capacity Manual 2000*

Table A-III

Urban Street Class based on Function and Design Categories

Design Category	Functional Category	
	Principal Arterial	**Minor Arterial**
High-Speed	I	Not applicable
Suburban	II	II
Intermediate	II	III or IV
Urban	III or IV	IV

Source: *Highway Capacity Manual 2000*

Table A-IV

Urban Street Levels of Service by Class

Urban Street Class	I	II	III	IV
Range of Free Flow Speeds (mph)	45 to 55	35 to 45	30 to 35	25 to 35
Typical Free Flow Speed (mph)	50	40	33	30
Level of Service	**Average Travel Speed (mph)**			
A	>42	>35	>30	>25
B	>34	>28	>24	>19
C	>27	>22	>18	>13
D	>21	>17	>14	>9
E	>16	>13	>10	>7
F	≤16	≤13	≤10	≤7

Source: *Highway Capacity Manual 2000*

Interrupted Flow

One of the more important elements limiting, and often interrupting the flow of traffic on a highway is the intersection. Flow on an interrupted facility is usually dominated by points of fixed operation such as traffic signals, stop and yield signs. These all operate quite differently and have differing impacts on overall flow.

Signalized Intersections

The capacity of a highway is related primarily to the geometric characteristics of the facility, as well as to the composition of the traffic stream on the facility. Geometrics are a fixed, or non-varying, characteristic of a facility.

At the signalized intersection, an additional element is introduced into the concept of capacity: time allocation. A traffic signal essentially allocates time among conflicting traffic movements seeking use of the same physical space. The way in which time is allocated has a significant impact on the operation of the intersection and on the capacity of the intersection and its approaches.

Level of service for signalized intersections is defined in terms of control delay, which is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, *i. e.,* in the absence of traffic control, geometric delay, any incidents, and any other vehicles. Specifically, level of service criteria for traffic signals are stated in terms of average control delay per vehicle, typically for a 15-minute analysis period. Delay is a complex measure and depends on a number of variables, including the quality of progression, the cycle length, the ratio of green time to cycle length and the volume to capacity ratio for the lane group.

For each intersection analyzed the average control delay per vehicle per approach is determined for the peak hour. A weighted average of control delay per vehicle is then determined for the intersection. A level of service designation is given to the control delay to better describe the level of operation. A

description of levels of service for signalized intersections can be found in Table A-V.

Table A-V

Description of Level of Service for Signalized Intersections

Level of Service	Description
A	Very low control delay, up to 10 seconds per vehicle. Progression is extremely favorable, and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.
B	Control delay greater than 10 and up to 20 seconds per vehicle. There is good progression or short cycle lengths or both. More vehicles stop causing higher levels of delay.
C	Control delay greater than 20 and up to 35 seconds per vehicle. Higher delays are caused by fair progression or longer cycle lengths or both. Individual cycle failures may begin to appear. Cycle failure occurs when a given green phase doe not serve queued vehicles, and overflow occurs. The number of vehicles stopping is significant, though many still pass through the intersection without stopping.
D	Control delay greater than 35 and up to 55 seconds per vehicle. The influence of congestions becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volumes. Many vehicles stop, the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Control delay greater than 55 and up to 80 seconds per vehicle. The limit of acceptable delay. High delays usually indicate poor progression, long cycle lengths, and high volumes. Individual cycle failures are frequent.
F	Control delay in excess of 80 seconds per vehicle. Unacceptable to most drivers. Oversaturation, arrival flow rates exceed the capacity of the intersection. Many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to higher delay.

Source: *Highway Capacity Manual 2000*

The use of control delay, which may also be referred to as signal delay, was introduced in the 1997 update to the *Highway Capacity Manual*, and represents a departure from previous updates. In the third edition, published in 1985 and the 1994 update to the third edition, delay only included stopped delay. Thus, the level of service criteria listed in Table A-V differs from earlier criteria.

Unsignalized Intersections

The current procedures on unsignalized intersections were first introduced in the 1997 update to the *Highway Capacity Manual* and represent a revision of the methodology published in the 1994 update to the 1985 *Highway Capacity Manual*. The revised procedures use control delay as a measure of effectiveness to determine level of service. Delay is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, *i. e.,* in the absence of traffic control, geometric delay, any incidents, and any other vehicles. Control delay is the increased time of travel for a vehicle approaching and passing through an unsignalized intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection.

Two-Way Stop Controlled Intersections

Two-way stop controlled intersections in which stop signs are used to assign the right-of-way, are the most prevalent type of intersection in the United States. At two-way stop-controlled intersections the stop-controlled approaches are referred as the minor street approaches and can be either public streets or private driveways. The approaches that are not controlled by stop signs are referred to as the major street approaches.

The capacity of movements subject to delay are determined using the "critical gap" method of capacity analysis. Expected average control delay based on movement volume and movement capacity is calculated. A level of service designation is given to the expected control delay for each minor movement. Level of service is not defined for the intersection as a whole. Control delay is the increased time of travel for a vehicle approaching and passing through a stop-controlled intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection. A description of levels of service for two-way stop-controlled intersections is found in Table A-VI.

Table A-VI

Description of Level of Service for Two-Way Stop Controlled Intersections

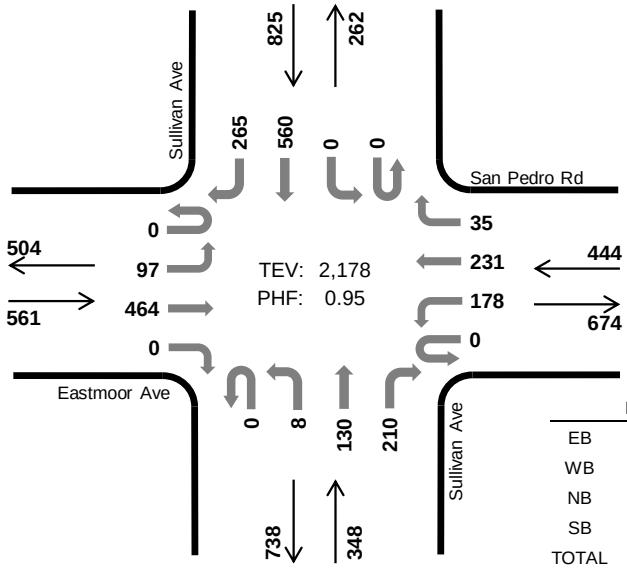
Level of Service	Description
A	Very low control delay less than 10 seconds per vehicle for each movement subject to delay.
B	Low control delay greater than 10 and up to 15 seconds per vehicle for each movement subject to delay.
C	Acceptable control delay greater than 15 and up to 25 seconds per vehicle for each movement subject to delay.
D	Tolerable control delay greater than 25 and up to 35 seconds per vehicle for each movement subject to delay.
E	Limit of tolerable control delay greater than 35 and up to 50 seconds per vehicle for each movement subject to delay.
F	Unacceptable control delay in excess of 50 seconds per vehicle for each movement subject to delay.

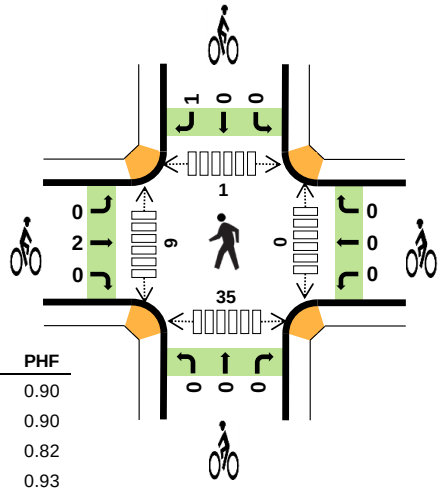
Source: *Highway Capacity Manual 2000*

Appendix B – Traffic Count Worksheets

Sullivan Ave
Eastmoor Ave

Date: 10-08-2019
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM





	HV %:	PHF
EB	0.7%	0.90
WB	2.5%	0.90
NB	2.3%	0.82
SB	1.1%	0.93
TOTAL	1.5%	0.95

Two-Hour Count Summaries

Interval Start		Eastmoor Ave Eastbound				San Pedro Rd Westbound				Sullivan Ave Northbound				Sullivan Ave Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	14	93	0	0	19	20	15	0	0	26	28	0	0	95	23	333	0
7:15 AM		0	23	105	0	0	37	37	13	0	4	21	32	0	0	107	36	415	0
7:30 AM		**0**	**20**	**118**	**0**	**0**	**35**	**54**	**9**	**0**	**1**	**26**	**33**	**0**	**0**	**124**	**71**	**491**	0
7:45 AM		**0**	**27**	**128**	**0**	**0**	**39**	**62**	**8**	**0**	**2**	**29**	**57**	**0**	**0**	**137**	**84**	**573**	1,812
8:00 AM		**0**	**30**	**120**	**0**	**0**	**50**	**52**	**11**	**0**	**2**	**34**	**58**	**0**	**0**	**163**	**53**	**573**	2,052
8:15 AM		**0**	**20**	**98**	**0**	**0**	**54**	**63**	**7**	**0**	**3**	**41**	**62**	**0**	**0**	**136**	**57**	**541**	**2,178**
8:30 AM		0	20	91	0	0	38	35	12	0	1	29	48	0	0	140	38	452	2,139
8:45 AM		0	20	99	0	0	73	33	18	0	0	48	50	0	0	98	39	478	2,044
Count Total		0	174	852	0	0	345	356	93	0	13	254	368	0	0	1,000	401	3,856	0
Peak Hour	**All**	**0**	**97**	**464**	**0**	**0**	**178**	**231**	**35**	**0**	**8**	**130**	**210**	**0**	**0**	**560**	**265**	**2,178**	**0**
	HV	**0**	**0**	**4**	**0**	**0**	**5**	**6**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**8**	**1**	**32**	**0**
	HV%	**-**	**0%**	**1%**	**-**	**-**	**3%**	**3%**	**0%**	**-**	**0%**	**0%**	**4%**	**-**	**-**	**1%**	**0%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	1	3	1	3	*8*	0	0	0	0	*0*	0	1	0	5	*6*
7:15 AM	0	2	3	1	*6*	2	0	0	0	*2*	0	0	0	8	*8*
7:30 AM	**0**	**4**	**2**	**3**	***9***	**1**	**0**	**0**	**1**	***2***	**0**	**0**	**0**	**6**	*6*
7:45 AM	**1**	**2**	**1**	**1**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**8**	*9*
8:00 AM	**1**	**3**	**3**	**3**	***10***	**0**	**0**	**0**	**0**	***0***	**0**	**4**	**0**	**14**	*18*
8:15 AM	**2**	**2**	**2**	**2**	***8***	**1**	**0**	**0**	**0**	***1***	**0**	**4**	**1**	**7**	***12***
8:30 AM	0	1	2	3	*6*	0	0	0	0	*0*	0	0	0	5	*5*
8:45 AM	3	2	1	1	*7*	2	0	0	0	*2*	0	0	0	4	*4*
Count Total	8	19	15	17	*59*	6	0	0	1	*7*	0	10	1	57	*68*
Peak Hour	**4**	**11**	**8**	**9**	***32***	**2**	**0**	**0**	**1**	***3***	**0**	**9**	**1**	**35**	***45***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Eastmoor Ave				San Pedro Rd				Sullivan Ave				Sullivan Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	1	0	0	0	2	1	0	0	0	1	0	0	1	2	8	0
7:15 AM	0	0	0	0	0	1	1	0	0	0	1	2	0	0	1	0	6	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**1**	**3**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**2**	**1**	**9**	0
7:45 AM	**0**	**0**	**1**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**5**	28
8:00 AM	**0**	**0**	**1**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**3**	**0**	**10**	30
8:15 AM	**0**	**0**	**2**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**2**	**0**	**8**	**32**
8:30 AM	0	0	0	0	0	1	0	0	0	0	1	1	0	0	2	1	6	29
8:45 AM	0	2	1	0	0	1	1	0	0	0	0	1	0	0	0	1	7	31
Count Total	0	2	6	0	0	8	10	1	0	0	2	13	0	0	12	5	59	0
Peak Hour	**0**	**0**	**4**	**0**	**0**	**5**	**6**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**8**	**1**	**32**	**0**

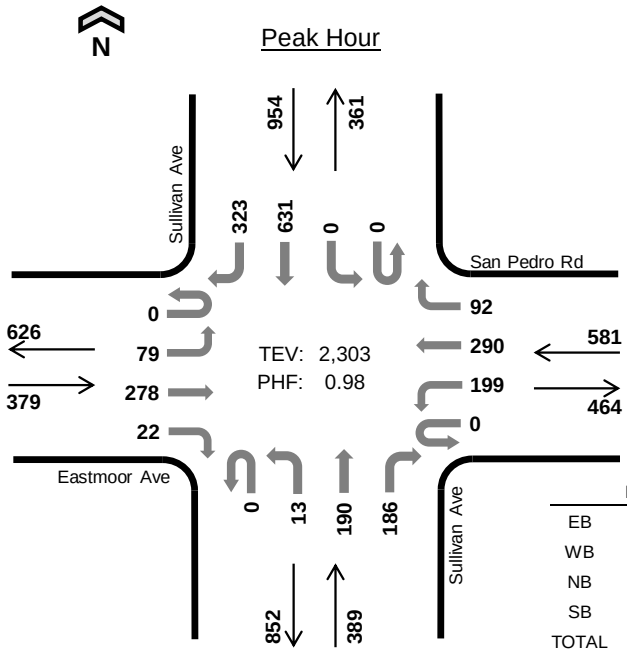
Two-Hour Count Summaries - Bikes

Interval Start	Eastmoor Ave			San Pedro Rd			Sullivan Ave			Sullivan Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	2	0	0	0	0	0	0	0	0	0	0	2	0
7:30 AM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	4
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	4
8:15 AM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	2	0	0	0	0	0	0	0	0	0	0	2	3
Count Total	0	6	0	0	0	0	0	0	0	0	0	1	7	0
Peak Hour	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**	**0**

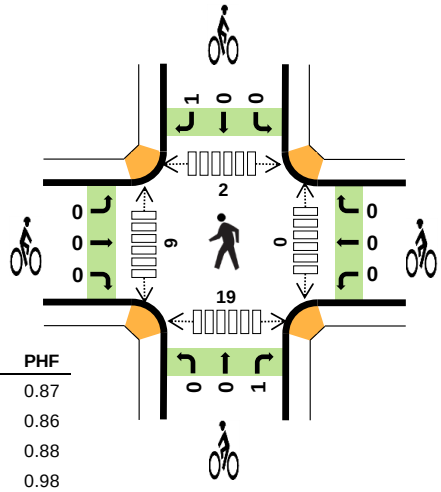
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Sullivan Ave
Eastmoor Ave

Date: 10-08-2019
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM



	HV %:	PHF
EB	0.8%	0.87
WB	1.0%	0.86
NB	1.3%	0.88
SB	0.4%	0.98
TOTAL	0.8%	0.98



Two-Hour Count Summaries

Interval Start		Eastmoor Ave Eastbound				San Pedro Rd Westbound				Sullivan Ave Northbound				Sullivan Ave Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	19	54	5	0	35	43	19	0	3	57	55	0	0	131	60	481	0
4:15 PM		0	21	60	4	0	41	45	23	0	2	40	34	0	0	127	76	473	0
4:30 PM		0	25	68	6	0	55	50	25	0	4	55	42	0	0	147	72	549	0
4:45 PM		**0**	**15**	**62**	**5**	**0**	**54**	**65**	**26**	**0**	**4**	**45**	**55**	**0**	**0**	**161**	**72**	**564**	2,067
5:00 PM		**0**	**22**	**68**	**3**	**0**	**54**	**56**	**24**	**0**	**2**	**54**	**55**	**0**	**0**	**161**	**81**	**580**	2,166
5:15 PM		**0**	**24**	**80**	**5**	**0**	**39**	**77**	**17**	**0**	**3**	**46**	**34**	**0**	**0**	**162**	**82**	**569**	2,262
5:30 PM		**0**	**18**	**68**	**9**	**0**	**52**	**92**	**25**	**0**	**4**	**45**	**42**	**0**	**0**	**147**	**88**	**590**	**2,303**
5:45 PM		0	24	58	3	0	53	91	25	0	7	37	33	0	0	141	92	564	2,303
Count Total		0	168	518	40	0	383	519	184	0	29	379	350	0	0	1,177	623	4,370	0
Peak Hour	**All**	**0**	**79**	**278**	**22**	**0**	**199**	**290**	**92**	**0**	**13**	**190**	**186**	**0**	**0**	**631**	**323**	**2,303**	**0**
	HV	**0**	**0**	**3**	**0**	**0**	**4**	**2**	**0**	**0**	**0**	**2**	**3**	**0**	**0**	**4**	**0**	**18**	**0**
	HV%	**-**	**0%**	**1%**	**0%**	**-**	**2%**	**1%**	**0%**	**-**	**0%**	**1%**	**2%**	**-**	**-**	**1%**	**0%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	1	2	3	*6*	0	0	0	0	*0*	0	6	0	8	*14*
4:15 PM	1	3	2	2	*8*	0	0	0	0	*0*	0	3	0	4	*7*
4:30 PM	1	2	2	1	*6*	0	0	0	0	*0*	0	1	0	3	*4*
4:45 PM	**2**	**1**	**0**	**2**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**1**	*2*
5:00 PM	**0**	**2**	**2**	**0**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**2**	**1**	**4**	*7*
5:15 PM	**1**	**1**	**1**	**2**	***5***	**0**	**0**	**1**	**0**	***1***	**0**	**2**	**1**	**7**	*10*
5:30 PM	**0**	**2**	**2**	**0**	***4***	**0**	**0**	**0**	**1**	***1***	**0**	**4**	**0**	**7**	***11***
5:45 PM	0	1	2	1	*4*	0	0	0	0	*0*	0	1	1	16	*18*
Count Total	5	13	13	11	*42*	0	0	1	1	*2*	0	20	3	50	*73*
Peak Hour	**3**	**6**	**5**	**4**	***18***	**0**	**0**	**1**	**1**	***2***	**0**	**9**	**2**	**19**	***30***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Eastmoor Ave				San Pedro Rd				Sullivan Ave				Sullivan Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	1	0	0	0	0	1	1	0	0	3	0	6	0
4:15 PM	0	0	1	0	0	2	0	1	0	0	1	1	0	0	2	0	8	0
4:30 PM	0	1	0	0	0	1	1	0	0	0	1	1	0	0	1	0	6	0
4:45 PM	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**5**	25
5:00 PM	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**4**	23
5:15 PM	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**0**	**5**	20
5:30 PM	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**4**	**18**
5:45 PM	0	0	0	0	0	0	1	0	0	0	1	1	0	0	1	0	4	17
Count Total	0	1	4	0	0	8	4	1	0	0	6	7	0	0	11	0	42	0
Peak Hour	**0**	**0**	**3**	**0**	**0**	**4**	**2**	**0**	**0**	**0**	**2**	**3**	**0**	**0**	**4**	**0**	**18**	**0**

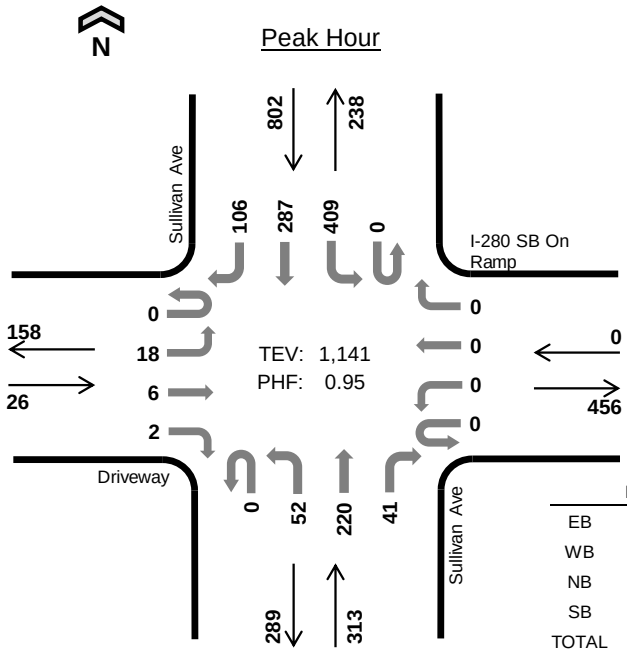
Two-Hour Count Summaries - Bikes

Interval Start	Eastmoor Ave			San Pedro Rd			Sullivan Ave			Sullivan Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	1
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**2**
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Count Total	0	0	0	0	0	0	0	0	1	0	0	1	2	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**2**	**0**

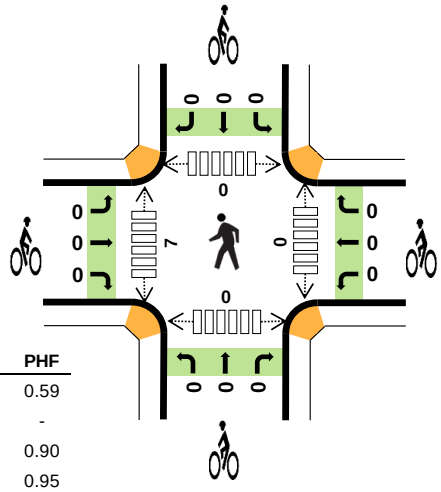
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Sullivan Ave
I-280 SB On Ramp

Date: 10-08-2019
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM



	HV %:	PHF
EB	3.8%	0.59
WB	-	-
NB	2.6%	0.90
SB	1.6%	0.95
TOTAL	1.9%	0.95



Two-Hour Count Summaries

Interval Start		Driveway				I-280 SB On Ramp				Sullivan Ave				Sullivan Ave				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	3	1	0	0	0	0	0	0	5	31	9	0	99	32	6	186	0
7:15 AM		0	2	0	0	0	0	0	0	0	3	35	5	0	88	61	13	207	0
7:30 AM		0	0	0	0	0	0	0	0	0	7	35	8	0	103	71	19	243	0
7:45 AM		0	0	3	0	0	0	0	0	0	12	54	8	0	96	82	15	270	906
8:00 AM		**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**56**	**20**	**0**	**124**	**64**	**22**	**297**	1,017
8:15 AM		**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**15**	**52**	**6**	**0**	**100**	**77**	**22**	**275**	1,085
8:30 AM		**0**	**5**	**3**	**1**	**0**	**0**	**0**	**0**	**0**	**13**	**47**	**9**	**0**	**95**	**73**	**22**	**268**	1,110
8:45 AM		**0**	**8**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**16**	**65**	**6**	**0**	**90**	**73**	**40**	**301**	**1,141**
Count Total		0	23	10	2	0	0	0	0	0	79	375	71	0	795	533	159	2,047	0
Peak Hour	**All**	**0**	**18**	**6**	**2**	**0**	**0**	**0**	**0**	**0**	**52**	**220**	**41**	**0**	**409**	**287**	**106**	**1,141**	**0**
	HV	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**7**	**0**	**0**	**7**	**6**	**0**	**22**	**0**
	HV%	**-**	**6%**	**0%**	**0%**	**-**	**-**	**-**	**-**	**-**	**2%**	**3%**	**0%**	**-**	**2%**	**2%**	**0%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	1	1	*2*	0	0	0	0	*0*	0	1	0	0	*1*
7:15 AM	0	0	2	1	*3*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	0	0	2	1	*3*	0	0	0	0	*0*	0	1	0	0	*1*
7:45 AM	0	0	1	3	*4*	0	0	0	0	*0*	0	1	0	0	*1*
8:00 AM	**1**	**0**	**3**	**4**	***8***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
8:15 AM	**0**	**0**	**2**	**5**	***7***	**0**	**0**	**0**	**0**	***0***	**0**	**4**	**0**	**0**	*4*
8:30 AM	**0**	**0**	**2**	**2**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:45 AM	**0**	**0**	**1**	**2**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**2**	**0**	**0**	***2***
Count Total	1	0	14	19	*34*	0	0	0	0	*0*	0	10	0	0	*10*
Peak Hour	**1**	**0**	**8**	**13**	***22***	**0**	**0**	**0**	**0**	***0***	**0**	**7**	**0**	**0**	***7***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Driveway				I-280 SB On Ramp				Sullivan Ave				Sullivan Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	3	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	3	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	2	1	0	4	12
8:00 AM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**2**	**2**	**0**	**8**	18
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**3**	**2**	**0**	**7**	22
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**1**	**0**	**4**	23
8:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**1**	**0**	**3**	**22**
Count Total	0	1	0	0	0	0	0	0	0	1	13	0	0	9	10	0	34	0
Peak Hour	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**7**	**0**	**0**	**7**	**6**	**0**	**22**	**0**

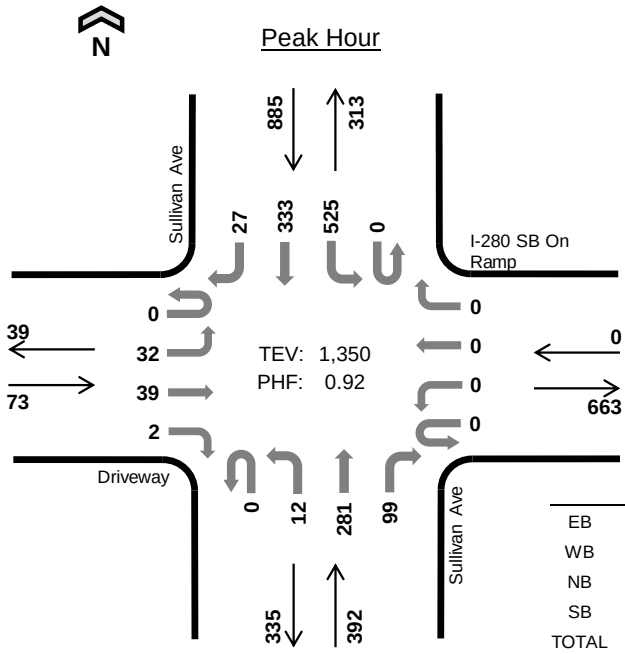
Two-Hour Count Summaries - Bikes

Interval Start	Driveway			I-280 SB On Ramp			Sullivan Ave			Sullivan Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

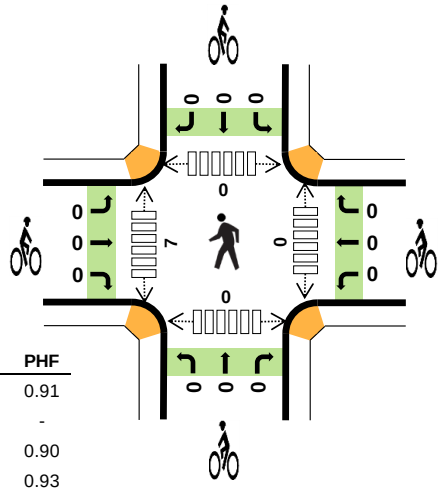
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Sullivan Ave
I-280 SB On Ramp

Date: 10-08-2019
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM



	HV %:	PHF
EB	0.0%	0.91
WB	-	-
NB	1.8%	0.90
SB	1.0%	0.93
TOTAL	1.2%	0.92



Two-Hour Count Summaries

Interval Start	Driveway Eastbound				I-280 SB On Ramp Westbound				Sullivan Ave Northbound				Sullivan Ave Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	14	6	0	0	0	0	0	0	12	74	22	0	120	68	21	337	0
4:15 PM	0	13	10	0	0	0	0	0	0	8	49	26	0	106	72	9	293	0
4:30 PM	**0**	**11**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**75**	**29**	**0**	**119**	**83**	**15**	**345**	0
4:45 PM	**0**	**4**	**15**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**70**	**21**	**0**	**122**	**89**	**6**	**328**	1,303
5:00 PM	**0**	**9**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**79**	**26**	**0**	**156**	**79**	**3**	**365**	1,331
5:15 PM	**0**	**8**	**6**	**2**	**0**	**0**	**0**	**0**	**0**	**3**	**57**	**23**	**0**	**128**	**82**	**3**	**312**	**1,350**
5:30 PM	0	11	4	0	0	0	0	0	0	3	62	16	0	138	73	5	312	1,317
5:45 PM	0	6	6	0	0	0	0	0	0	2	55	26	0	138	77	3	313	1,302
Count Total	0	76	65	2	0	0	0	0	0	37	521	189	0	1,027	623	65	2,605	0
Peak Hour All	**0**	**32**	**39**	**2**	**0**	**0**	**0**	**0**	**0**	**12**	**281**	**99**	**0**	**525**	**333**	**27**	**1,350**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**2**	**0**	**6**	**2**	**1**	**16**	**0**
Peak Hour HV%	**-**	**0%**	**0%**	**0%**	**-**	**-**	**-**	**-**	**-**	**0%**	**2%**	**2%**	**-**	**1%**	**1%**	**4%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	0	4	*4*	0	0	0	0	*0*	0	3	0	0	*3*
4:15 PM	0	0	2	6	*8*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	**0**	**0**	**2**	**1**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**2**	**0**	**0**	*2*
4:45 PM	**0**	**0**	**0**	**3**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
5:00 PM	**0**	**0**	**3**	**2**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
5:15 PM	**0**	**0**	**2**	**3**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**3**	**0**	**0**	***3***
5:30 PM	1	0	2	2	*5*	0	0	0	0	*0*	0	2	0	0	*2*
5:45 PM	0	0	3	1	*4*	0	0	0	0	*0*	0	1	0	0	*1*
Count Total	1	0	14	22	*37*	0	0	0	0	*0*	0	13	0	0	*13*
Peak Hour	**0**	**0**	**7**	**9**	***16***	**0**	**0**	**0**	**0**	***0***	**0**	**7**	**0**	**0**	***7***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Driveway				I-280 SB On Ramp				Sullivan Ave				Sullivan Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	4	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	3	3	0	8	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**3**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**3**	18
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**2**	**0**	**0**	**5**	19
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**2**	**0**	**1**	**5**	**16**
5:30 PM	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	5	18
5:45 PM	0	0	0	0	0	0	0	0	0	0	2	1	0	1	0	0	4	19
Count Total	0	0	1	0	0	0	0	0	0	0	11	3	0	12	9	1	37	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**2**	**0**	**6**	**2**	**1**	**16**	**0**

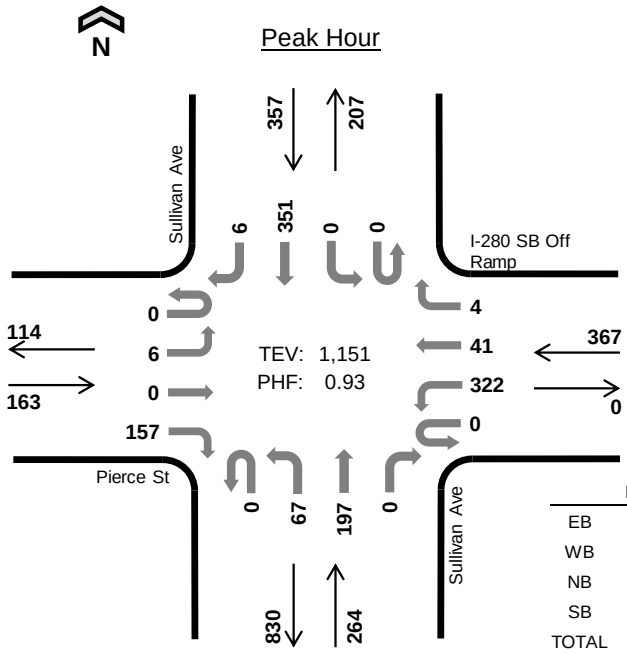
Two-Hour Count Summaries - Bikes

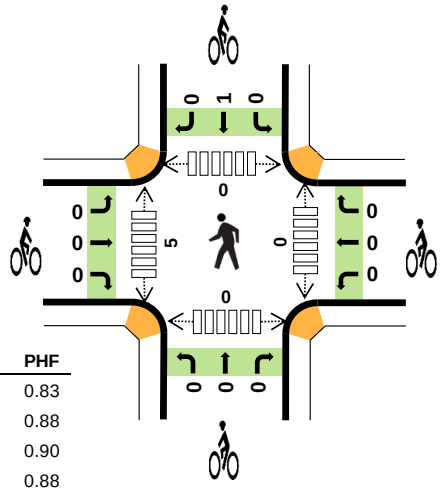
Interval Start	Driveway			I-280 SB On Ramp			Sullivan Ave			Sullivan Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Sullivan Ave
Pierce St

Date: 10-08-2019
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM





	HV %:	PHF
EB	1.2%	0.83
WB	0.8%	0.88
NB	0.4%	0.90
SB	1.4%	0.88
TOTAL	1.0%	0.93

Two-Hour Count Summaries

Interval Start		Pierce St Eastbound				I-280 SB Off Ramp Westbound				Sullivan Ave Northbound				Sullivan Ave Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	2	0	17	0	28	12	0	0	15	39	0	0	0	62	1	176	0
7:15 AM		0	3	0	24	0	56	13	2	0	23	38	0	0	0	65	0	224	0
7:30 AM		**0**	**2**	**0**	**35**	**0**	**88**	**15**	**0**	**0**	**13**	**42**	**0**	**0**	**0**	**79**	**0**	**274**	0
7:45 AM		**0**	**1**	**0**	**38**	**0**	**94**	**8**	**2**	**0**	**19**	**46**	**0**	**0**	**0**	**88**	**1**	**297**	971
8:00 AM		**0**	**2**	**0**	**47**	**0**	**77**	**7**	**1**	**0**	**21**	**52**	**0**	**0**	**0**	**100**	**1**	**308**	1,103
8:15 AM		**0**	**1**	**0**	**37**	**0**	**63**	**11**	**1**	**0**	**14**	**57**	**0**	**0**	**0**	**84**	**4**	**272**	**1,151**
8:30 AM		0	1	0	27	0	76	10	1	0	19	42	0	0	0	70	4	250	1,127
8:45 AM		0	4	0	18	0	57	7	2	0	23	58	0	0	0	62	2	233	1,063
Count Total		0	16	0	243	0	539	83	9	0	147	374	0	0	0	610	13	2,034	0
Peak Hour	**All**	**0**	**6**	**0**	**157**	**0**	**322**	**41**	**4**	**0**	**67**	**197**	**0**	**0**	**0**	**351**	**6**	**1,151**	**0**
	HV	**0**	**0**	**0**	**2**	**0**	**2**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**5**	**0**	**11**	**0**
	HV%	**-**	**0%**	**-**	**1%**	**-**	**1%**	**0%**	**25%**	**-**	**1%**	**0%**	**-**	**-**	**-**	**1%**	**0%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	1	1	2	1	*5*	0	0	0	0	*0*	0	1	0	0	*1*
7:15 AM	0	0	1	1	*2*	0	0	0	0	*0*	0	1	0	0	*1*
7:30 AM	**2**	**0**	**0**	**1**	***3***	**0**	**0**	**0**	**1**	***1***	**0**	**1**	**0**	**0**	*1*
7:45 AM	**0**	**1**	**0**	**1**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
8:00 AM	**0**	**1**	**1**	**3**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
8:15 AM	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**2**	**0**	**0**	***2***
8:30 AM	0	1	1	2	*4*	0	0	0	0	*0*	0	3	0	0	*3*
8:45 AM	0	0	1	1	*2*	0	0	0	0	*0*	0	1	0	0	*1*
Count Total	3	5	6	10	*24*	0	0	0	1	*1*	0	11	0	0	*11*
Peak Hour	**2**	**3**	**1**	**5**	***11***	**0**	**0**	**0**	**1**	***1***	**0**	**5**	**0**	**0**	***5***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Pierce St				I-280 SB Off Ramp				Sullivan Ave				Sullivan Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	1	0	1	0	0	0	1	1	0	0	0	1	0	5	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	0
7:30 AM	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**3**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**2**	12
8:00 AM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**3**	**0**	**5**	12
8:15 AM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**11**
8:30 AM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2	0	4	12
8:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	12
Count Total	0	0	0	3	0	4	0	1	0	3	3	0	0	0	10	0	24	0
Peak Hour	**0**	**0**	**0**	**2**	**0**	**2**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**5**	**0**	**11**	**0**

Two-Hour Count Summaries - Bikes

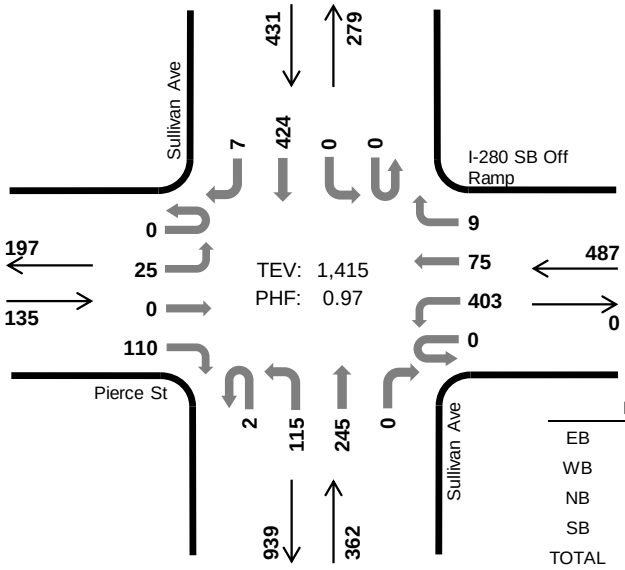
Interval Start	Pierce St			I-280 SB Off Ramp			Sullivan Ave			Sullivan Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

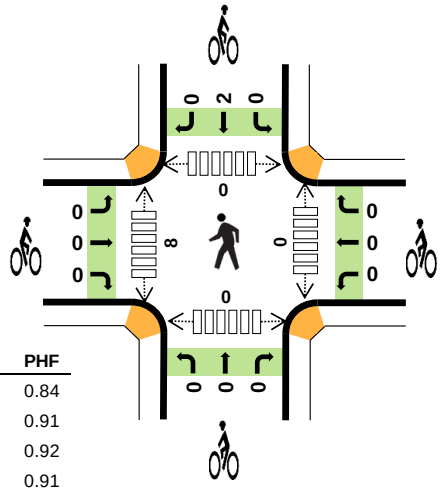
Sullivan Ave
Pierce St

Date: 10-08-2019
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM

Peak Hour



	HV %:	PHF
EB	0.0%	0.84
WB	0.4%	0.91
NB	0.6%	0.92
SB	0.5%	0.91
TOTAL	0.4%	0.97



Two-Hour Count Summaries

Interval Start		Pierce St Eastbound				I-280 SB Off Ramp Westbound				Sullivan Ave Northbound				Sullivan Ave Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	3	0	23	0	77	11	1	1	28	66	0	0	0	83	5	298	0
4:15 PM		0	6	0	18	0	101	30	3	0	24	60	0	0	0	89	7	338	0
4:30 PM		0	7	0	28	0	94	15	1	3	24	76	0	0	0	83	1	332	0
4:45 PM		**0**	**9**	**0**	**26**	**0**	**92**	**20**	**3**	**0**	**24**	**65**	**0**	**0**	**0**	**111**	**2**	**352**	1,320
5:00 PM		**0**	**2**	**0**	**26**	**0**	**99**	**19**	**3**	**1**	**35**	**62**	**0**	**0**	**0**	**116**	**2**	**365**	1,387
5:15 PM		**0**	**10**	**0**	**30**	**0**	**110**	**21**	**3**	**1**	**23**	**58**	**0**	**0**	**0**	**93**	**2**	**351**	1,400
5:30 PM		**0**	**4**	**0**	**28**	**0**	**102**	**15**	**0**	**0**	**33**	**60**	**0**	**0**	**0**	**104**	**1**	**347**	**1,415**
5:45 PM		0	6	0	22	0	98	18	4	0	32	56	0	0	0	105	2	343	1,406
Count Total		0	47	0	201	0	773	149	18	6	223	503	0	0	0	784	22	2,726	0
Peak Hour	**All**	**0**	**25**	**0**	**110**	**0**	**403**	**75**	**9**	**2**	**115**	**245**	**0**	**0**	**0**	**424**	**7**	**1,415**	**0**
	HV	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**0**	**6**	**0**
	HV%	**-**	**0%**	**-**	**0%**	**-**	**0%**	**0%**	**0%**	**0%**	**0%**	**1%**	**-**	**-**	**-**	**0%**	**0%**	**0%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	2	1	2	*5*	0	0	0	0	*0*	0	1	0	0	*1*
4:15 PM	1	1	2	0	*4*	0	0	0	0	*0*	0	4	0	0	*4*
4:30 PM	0	1	2	0	*3*	0	0	0	0	*0*	0	1	0	0	*1*
4:45 PM	**0**	**1**	**0**	**1**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**4**	**0**	**0**	*4*
5:00 PM	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
5:15 PM	**0**	**1**	**0**	**1**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
5:30 PM	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**2**	***2***	**0**	**2**	**0**	**0**	***2***
5:45 PM	0	1	1	0	*2*	0	0	0	0	*0*	0	1	0	0	*1*
Count Total	1	7	8	4	*20*	0	0	0	2	*2*	0	15	0	0	*15*
Peak Hour	**0**	**2**	**2**	**2**	***6***	**0**	**0**	**0**	**2**	***2***	**0**	**8**	**0**	**0**	***8***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Pierce St				I-280 SB Off Ramp				Sullivan Ave				Sullivan Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	1	1	0	0	0	1	0	0	0	2	0	5	0
4:15 PM	0	0	0	1	0	1	0	0	0	1	1	0	0	0	0	0	4	0
4:30 PM	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	3	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**2**	14
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	10
5:15 PM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**2**	8
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**6**
5:45 PM	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	2	6
Count Total	0	0	0	1	0	6	1	0	0	1	7	0	0	0	4	0	20	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**0**	**6**	**0**

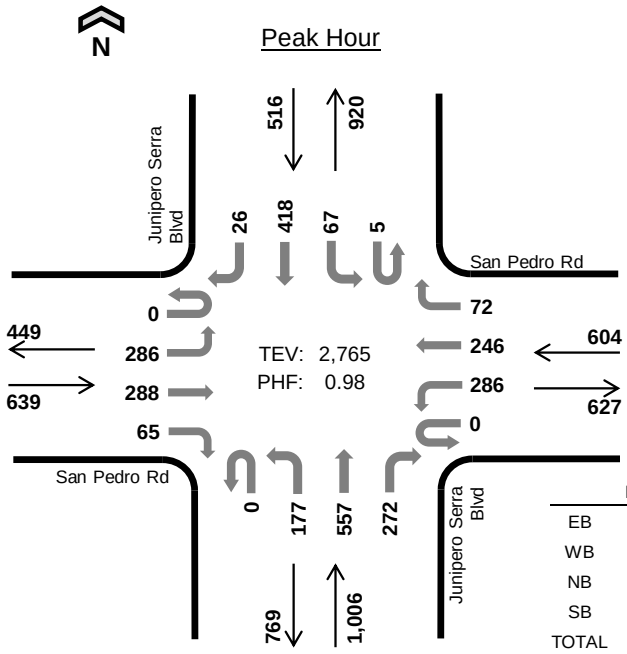
Two-Hour Count Summaries - Bikes

Interval Start	Pierce St			I-280 SB Off Ramp			Sullivan Ave			Sullivan Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	**2**
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Count Total	0	0	0	0	0	0	0	0	0	0	2	0	2	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	**0**

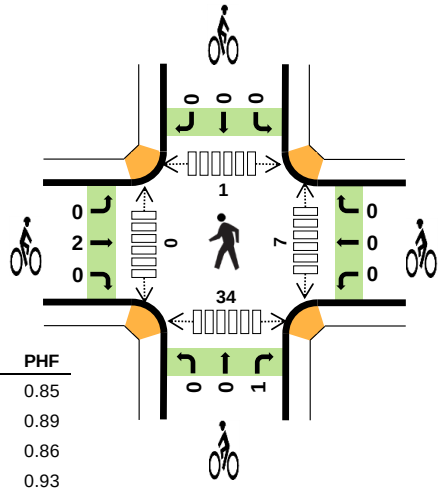
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Junipero Serra Blvd
San Pedro Rd

Date: 10-08-2019
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM



	HV %:	PHF
EB	1.7%	0.85
WB	3.0%	0.89
NB	1.1%	0.86
SB	2.9%	0.93
TOTAL	2.0%	0.98



Two-Hour Count Summaries

Interval Start	San Pedro Rd Eastbound				San Pedro Rd Westbound				Junipero Serra Blvd Northbound				Junipero Serra Blvd Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	76	38	12	0	55	14	14	0	46	88	51	1	13	53	4	465	0
7:15 AM	0	66	54	14	0	51	37	8	0	42	125	53	0	9	85	5	549	0
7:30 AM	0	74	61	13	0	87	59	9	0	28	133	73	0	9	110	6	662	0
7:45 AM	0	84	76	14	0	88	59	9	0	35	143	76	1	16	92	7	700	2,376
8:00 AM	**0**	**87**	**82**	**18**	**0**	**74**	**76**	**14**	**0**	**35**	**110**	**64**	**1**	**19**	**104**	**2**	**686**	2,597
8:15 AM	**0**	**74**	**76**	**16**	**0**	**77**	**72**	**20**	**0**	**45**	**147**	**63**	**2**	**14**	**88**	**11**	**705**	2,753
8:30 AM	**0**	**54**	**66**	**21**	**0**	**71**	**48**	**17**	**0**	**36**	**148**	**66**	**2**	**19**	**115**	**3**	**666**	2,757
8:45 AM	**0**	**71**	**64**	**10**	**0**	**64**	**50**	**21**	**0**	**61**	**152**	**79**	**0**	**15**	**111**	**10**	**708**	**2,765**
Count Total	0	586	517	118	0	567	415	112	0	328	1,046	525	7	114	758	48	5,141	0
Peak Hour All	**0**	**286**	**288**	**65**	**0**	**286**	**246**	**72**	**0**	**177**	**557**	**272**	**5**	**67**	**418**	**26**	**2,765**	**0**
Peak Hour HV	**0**	**4**	**7**	**0**	**0**	**5**	**7**	**6**	**0**	**1**	**7**	**3**	**0**	**5**	**10**	**0**	**55**	**0**
Peak Hour HV%	**-**	**1%**	**2%**	**0%**	**-**	**2%**	**3%**	**8%**	**-**	**1%**	**1%**	**1%**	**0%**	**7%**	**2%**	**0%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	2	3	7	4	*16*	0	0	0	0	*0*	2	0	0	5	*7*
7:15 AM	2	5	6	6	*19*	1	2	1	0	*4*	1	0	0	7	*8*
7:30 AM	1	5	3	10	*19*	1	0	0	0	*1*	0	0	0	7	*7*
7:45 AM	3	5	2	5	*15*	0	0	0	0	*0*	0	0	0	8	*8*
8:00 AM	**4**	**5**	**3**	**4**	***16***	**0**	**0**	**0**	**0**	***0***	**4**	**0**	**0**	**15**	*19*
8:15 AM	**4**	**5**	**4**	**4**	***17***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**1**	**7**	*9*
8:30 AM	**1**	**4**	**0**	**2**	***7***	**0**	**0**	**0**	**0**	***0***	**2**	**0**	**0**	**8**	*10*
8:45 AM	**2**	**4**	**4**	**5**	***15***	**2**	**0**	**1**	**0**	***3***	**0**	**0**	**0**	**4**	***4***
Count Total	19	36	29	40	*124*	4	2	2	0	*8*	10	0	1	61	*72*
Peak Hour	**11**	**18**	**11**	**15**	***55***	**2**	**0**	**1**	**0**	***3***	**7**	**0**	**1**	**34**	***42***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	San Pedro Rd				San Pedro Rd				Junipero Serra Blvd				Junipero Serra Blvd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	1	1	0	0	1	1	1	0	1	3	3	0	1	2	1	16	0
7:15 AM	0	1	1	0	0	1	2	2	0	0	3	3	0	2	4	0	19	0
7:30 AM	0	0	1	0	0	1	3	1	0	0	1	2	0	3	6	1	19	0
7:45 AM	0	1	2	0	0	1	1	3	0	1	1	0	0	1	4	0	15	69
8:00 AM	**0**	**3**	**1**	**0**	**0**	**2**	**2**	**1**	**0**	**1**	**2**	**0**	**0**	**1**	**3**	**0**	**16**	69
8:15 AM	**0**	**1**	**3**	**0**	**0**	**2**	**2**	**1**	**0**	**0**	**4**	**0**	**0**	**2**	**2**	**0**	**17**	67
8:30 AM	**0**	**0**	**1**	**0**	**0**	**1**	**1**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**7**	55
8:45 AM	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**2**	**0**	**0**	**1**	**3**	**0**	**2**	**3**	**0**	**15**	**55**
Count Total	0	7	12	0	0	9	14	13	0	3	15	11	0	12	26	2	124	0
Peak Hour	**0**	**4**	**7**	**0**	**0**	**5**	**7**	**6**	**0**	**1**	**7**	**3**	**0**	**5**	**10**	**0**	**55**	**0**

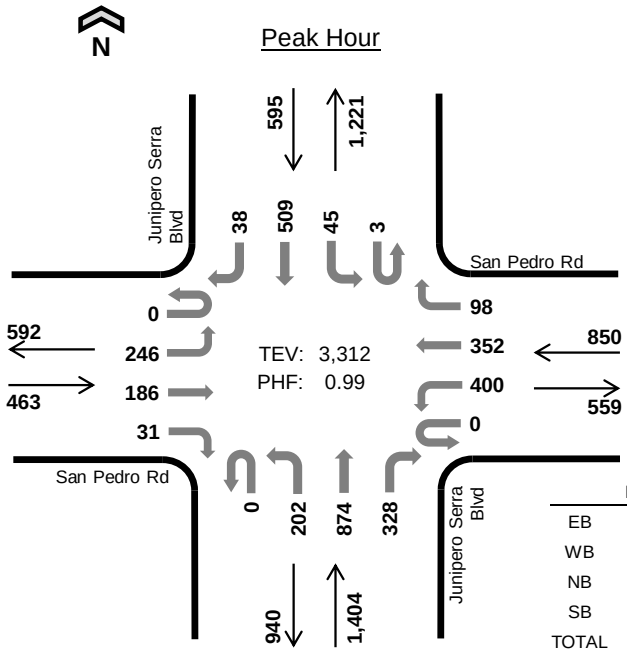
Two-Hour Count Summaries - Bikes

Interval Start	San Pedro Rd			San Pedro Rd			Junipero Serra Blvd			Junipero Serra Blvd			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	1	0	2	0	0	0	1	0	0	0	0	4	0
7:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	1	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	5
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	5
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:45 AM	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**3**
Count Total	0	4	0	2	0	0	0	1	1	0	0	0	8	0
Peak Hour	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**0**

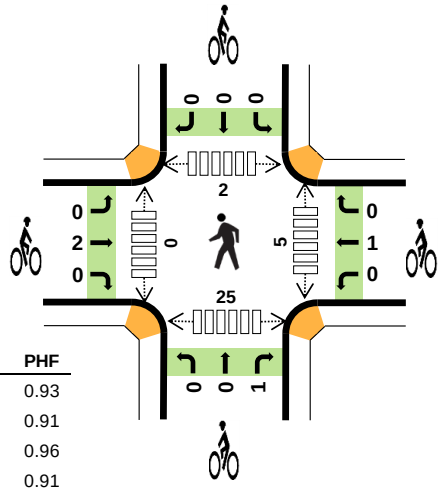
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Junipero Serra Blvd
San Pedro Rd

Date: 10-08-2019
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM



	HV %:	PHF
EB	1.1%	0.93
WB	1.4%	0.91
NB	0.8%	0.96
SB	1.0%	0.91
TOTAL	1.0%	0.99



Two-Hour Count Summaries

Interval Start		San Pedro Rd Eastbound				San Pedro Rd Westbound				Junipero Serra Blvd Northbound				Junipero Serra Blvd Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	62	42	9	0	87	57	24	0	41	188	77	1	6	105	4	703	0
4:15 PM		0	39	48	8	0	73	54	23	0	50	233	71	0	12	117	6	734	0
4:30 PM		0	59	43	5	0	90	61	25	0	49	231	82	1	5	151	15	817	0
4:45 PM		**0**	**69**	**49**	**6**	**0**	**106**	**93**	**23**	**0**	**49**	**195**	**90**	**1**	**13**	**129**	**8**	**831**	3,085
5:00 PM		**0**	**62**	**42**	**12**	**0**	**105**	**79**	**22**	**0**	**44**	**213**	**91**	**0**	**9**	**128**	**9**	**816**	3,198
5:15 PM		**0**	**62**	**47**	**5**	**0**	**92**	**77**	**19**	**0**	**52**	**250**	**64**	**1**	**15**	**137**	**10**	**831**	3,295
5:30 PM		**0**	**53**	**48**	**8**	**0**	**97**	**103**	**34**	**0**	**57**	**216**	**83**	**1**	**8**	**115**	**11**	**834**	**3,312**
5:45 PM		0	41	45	10	0	83	100	31	0	55	243	77	1	10	109	14	819	3,300
Count Total		0	447	364	63	0	733	624	201	0	397	1,769	635	6	78	991	77	6,385	0
Peak Hour	**All**	**0**	**246**	**186**	**31**	**0**	**400**	**352**	**98**	**0**	**202**	**874**	**328**	**3**	**45**	**509**	**38**	**3,312**	**0**
	HV	**0**	**1**	**4**	**0**	**0**	**1**	**6**	**5**	**0**	**1**	**9**	**1**	**0**	**5**	**1**	**0**	**34**	**0**
	HV%	**-**	**0%**	**2%**	**0%**	**-**	**0%**	**2%**	**5%**	**-**	**0%**	**1%**	**0%**	**0%**	**11%**	**0%**	**0%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	1	1	3	2	*7*	0	0	0	0	*0*	0	0	0	8	*8*
4:15 PM	2	4	2	4	*12*	0	0	0	0	*0*	0	0	0	3	*3*
4:30 PM	1	4	2	3	*10*	0	0	0	0	*0*	0	0	0	3	*3*
4:45 PM	**2**	**4**	**4**	**2**	***12***	**1**	**0**	**0**	**0**	***1***	**1**	**0**	**0**	**2**	*3*
5:00 PM	**1**	**2**	**3**	**1**	***7***	**0**	**1**	**0**	**0**	***1***	**1**	**0**	**0**	**4**	*5*
5:15 PM	**2**	**1**	**1**	**2**	***6***	**1**	**0**	**0**	**0**	***1***	**2**	**0**	**2**	**6**	*10*
5:30 PM	**0**	**5**	**3**	**1**	***9***	**0**	**0**	**1**	**0**	***1***	**1**	**0**	**0**	**13**	***14***
5:45 PM	2	1	2	2	*7*	0	0	0	0	*0*	2	0	1	12	*15*
Count Total	11	22	20	17	*70*	2	1	1	0	*4*	7	0	3	51	*61*
Peak Hour	**5**	**12**	**11**	**6**	***34***	**2**	**1**	**1**	**0**	***4***	**5**	**0**	**2**	**25**	***32***

Two-Hour Count Summaries - Heavy Vehicles

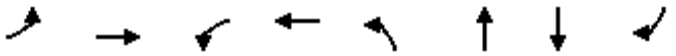
Interval Start	San Pedro Rd				San Pedro Rd				Junipero Serra Blvd				Junipero Serra Blvd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	1	0	0	0	0	1	0	0	0	2	1	0	1	1	0	7	0
4:15 PM	0	0	2	0	0	1	2	1	0	0	2	0	0	2	2	0	12	0
4:30 PM	0	0	1	0	0	1	2	1	0	0	0	2	0	1	2	0	10	0
4:45 PM	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**2**	**0**	**0**	**4**	**0**	**0**	**2**	**0**	**0**	**12**	41
5:00 PM	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**1**	**0**	**1**	**1**	**1**	**0**	**0**	**1**	**0**	**7**	41
5:15 PM	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**0**	**0**	**6**	35
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**2**	**0**	**0**	**3**	**0**	**0**	**1**	**0**	**0**	**9**	**34**
5:45 PM	0	0	2	0	0	0	0	1	0	1	1	0	0	2	0	0	7	29
Count Total	0	2	9	0	0	3	11	8	0	2	14	4	0	11	6	0	70	0
Peak Hour	**0**	**1**	**4**	**0**	**0**	**1**	**6**	**5**	**0**	**1**	**9**	**1**	**0**	**5**	**1**	**0**	**34**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	San Pedro Rd			San Pedro Rd			Junipero Serra Blvd			Junipero Serra Blvd			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	1
5:00 PM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	2
5:15 PM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	3
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**4**
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Count Total	0	2	0	0	1	0	0	0	1	0	0	0	4	0
Peak Hour	**0**	**2**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**4**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

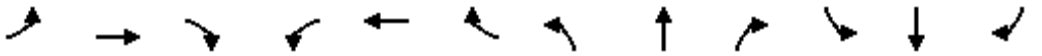
Appendix C – Existing Conditions Intersections Level of Service Worksheets



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	74	516	198	296	10	415	602	285
v/c Ratio	0.50	0.68	0.54	0.63	0.10	0.21	0.31	0.30
Control Delay	59.4	44.1	55.0	49.5	51.6	5.3	15.8	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.4	44.1	55.0	49.5	51.6	5.3	15.8	3.2
Queue Length 50th (ft)	51	176	61	220	7	25	110	0
Queue Length 95th (ft)	96	218	m85	m304	23	48	212	53
Internal Link Dist (ft)		718		559		185	480	
Turn Bay Length (ft)	80		210		95			
Base Capacity (vph)	209	1093	592	667	160	1942	1952	963
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.47	0.33	0.44	0.06	0.21	0.31	0.30

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



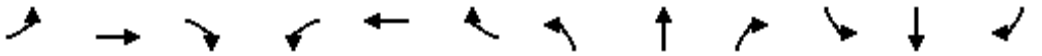
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	464	0	178	231	35	8	130	210	0	560	265
Future Volume (vph)	67	464	0	178	231	35	8	130	210	0	560	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		0.97	1.00		1.00	0.95			0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.98		1.00	0.91			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770	3539		3433	1823		1770	3212			3539	1515
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (perm)	1770	3539		3433	1823		1770	3212			3539	1515
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.82	0.82	0.82	0.93	0.93	0.93
Adj. Flow (vph)	74	516	0	198	257	39	10	159	256	0	602	285
RTOR Reduction (vph)	0	0	0	0	6	0	0	112	0	0	0	138
Lane Group Flow (vph)	74	516	0	198	290	0	10	303	0	0	602	147
Confl. Peds. (#/hr)			35			1						9
Confl. Bikes (#/hr)			2									
Turn Type	Prot	NA		Prot	NA		Prot	NA			NA	Perm
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases												6
Actuated Green, G (s)	8.0	24.4		11.7	28.1		1.3	61.9			56.6	56.6
Effective Green, g (s)	8.0	24.4		11.7	28.1		1.3	61.9			56.6	56.6
Actuated g/C Ratio	0.07	0.22		0.11	0.26		0.01	0.56			0.51	0.51
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	2.0	4.0		3.0	4.0		2.0	4.0			4.0	4.0
Lane Grp Cap (vph)	128	785		365	465		20	1807			1820	779
v/s Ratio Prot	0.04	0.15		c0.06	c0.16		c0.01	0.09			c0.17	
v/s Ratio Perm												0.10
v/c Ratio	0.58	0.66		0.54	0.62		0.50	0.17			0.33	0.19
Uniform Delay, d1	49.4	39.0		46.6	36.3		54.0	11.6			15.6	14.4
Progression Factor	1.00	1.00		1.08	1.24		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.9	2.2		1.4	2.6		7.0	0.2			0.5	0.5
Delay (s)	53.3	41.2		51.8	47.4		61.0	11.8			16.1	14.9
Level of Service	D	D		D	D		E	B			B	B
Approach Delay (s)		42.7			49.2			13.0			15.7	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

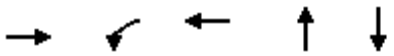
Lane Group	EBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	44	58	244	46	431	414
v/c Ratio	0.12	0.26	0.12	0.05	0.63	0.32
Control Delay	23.7	26.1	8.0	0.9	26.3	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	26.1	8.0	0.9	26.3	6.6
Queue Length 50th (ft)	7	19	23	0	72	64
Queue Length 95th (ft)	12	47	42	5	113	136
Internal Link Dist (ft)	293		441			421
Turn Bay Length (ft)		100		100	155	
Base Capacity (vph)	566	354	1982	927	691	1302
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.16	0.12	0.05	0.62	0.32

Intersection Summary



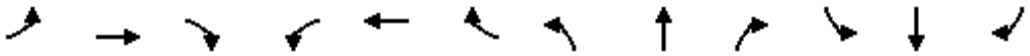
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	6	2	0	0	0	52	220	41	409	287	106
Future Volume (vph)	18	6	2	0	0	0	52	220	41	409	287	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.95					1.00	0.95	1.00	0.97	1.00	
Frpb, ped/bikes		1.00					1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes		1.00					1.00	1.00	1.00	1.00	1.00	
Frt		0.99					1.00	1.00	0.85	1.00	0.96	
Flt Protected		0.97					0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3384					1770	3539	1583	3433	1773	
Flt Permitted		0.97					0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3384					1770	3539	1583	3433	1773	
Peak-hour factor, PHF	0.59	0.59	0.59	0.25	0.25	0.25	0.90	0.90	0.90	0.95	0.95	0.95
Adj. Flow (vph)	31	10	3	0	0	0	58	244	46	431	302	112
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	21	0	14	0
Lane Group Flow (vph)	0	41	0	0	0	0	58	244	25	431	400	0
Confl. Peds. (#/hr)												7
Turn Type	Split	NA					Prot	NA	Perm	Prot	NA	
Protected Phases	4	4					5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		4.0					5.1	32.0	32.0	12.0	38.9	
Effective Green, g (s)		4.0					5.1	32.0	32.0	12.0	38.9	
Actuated g/C Ratio		0.07					0.08	0.53	0.53	0.20	0.65	
Clearance Time (s)		4.0					4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0					3.0	3.0	3.0	3.0	4.0	
Lane Grp Cap (vph)		225					150	1887	844	686	1149	
v/s Ratio Prot		c0.01					0.03	0.07		c0.13	c0.23	
v/s Ratio Perm									0.02			
v/c Ratio		0.18					0.39	0.13	0.03	0.63	0.35	
Uniform Delay, d1		26.5					26.0	7.0	6.6	22.0	4.8	
Progression Factor		1.00					1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.4					1.7	0.1	0.1	1.8	0.8	
Delay (s)		26.9					27.6	7.2	6.7	23.8	5.6	
Level of Service		C					C	A	A	C	A	
Approach Delay (s)		26.9			0.0			10.5			14.9	
Approach LOS		C			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	196	205	208	293	406
v/c Ratio	0.54	0.60	0.60	0.25	0.28
Control Delay	10.6	25.6	25.6	11.0	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	25.6	25.6	11.0	10.9
Queue Length 50th (ft)	2	53	54	24	34
Queue Length 95th (ft)	39	113	114	62	78
Internal Link Dist (ft)	524		499	480	576
Turn Bay Length (ft)		290			
Base Capacity (vph)	635	701	711	1743	1473
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.31	0.29	0.29	0.17	0.28

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	0	157	322	41	0	67	197	0	0	351	6
Future Volume (vph)	6	0	157	322	41	0	67	197	0	0	351	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.1		4.1	4.1			4.1			4.1	
Lane Util. Factor		1.00		0.95	0.95			0.95			0.95	
Frpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Frt		0.87		1.00	1.00			1.00			1.00	
Flt Protected		1.00		0.95	0.96			0.99			1.00	
Satd. Flow (prot)		1617		1681	1704			3495			3528	
Flt Permitted		1.00		0.95	0.96			0.80			1.00	
Satd. Flow (perm)		1617		1681	1704			2830			3528	
Peak-hour factor, PHF	0.83	0.83	0.83	0.88	0.88	0.88	0.90	0.90	0.90	0.88	0.88	0.88
Adj. Flow (vph)	7	0	189	366	47	0	74	219	0	0	399	7
RTOR Reduction (vph)	0	166	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	30	0	205	208	0	0	293	0	0	405	0
Confl. Peds. (#/hr)												5
Confl. Bikes (#/hr)												1
Turn Type	Split	NA		Split	NA		pm+pt	NA			NA	
Protected Phases	4	4		3	3		5	2			6	
Permitted Phases							2					
Actuated Green, G (s)		6.0		9.8	9.8			20.2			20.2	
Effective Green, g (s)		6.0		9.8	9.8			20.2			20.2	
Actuated g/C Ratio		0.12		0.20	0.20			0.42			0.42	
Clearance Time (s)		4.1		4.1	4.1			4.1			4.1	
Vehicle Extension (s)		1.5		1.5	1.5			2.0			2.0	
Lane Grp Cap (vph)		200		341	345			1183			1475	
v/s Ratio Prot		c0.02		0.12	c0.12						c0.11	
v/s Ratio Perm								0.10				
v/c Ratio		0.15		0.60	0.60			0.25			0.27	
Uniform Delay, d1		18.9		17.5	17.5			9.1			9.2	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.1		2.0	2.0			0.0			0.5	
Delay (s)		19.0		19.5	19.5			9.2			9.7	
Level of Service		B		B	B			A			A	
Approach Delay (s)		19.0			19.5			9.2			9.7	
Approach LOS		B			B			A			A	

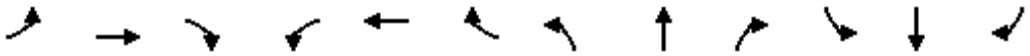
Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	48.3	Sum of lost time (s)	15.8
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	336	415	321	357	206	648	316	77	477
v/c Ratio	0.67	0.92	0.79	0.31	0.75	0.59	0.46	0.62	0.64
Control Delay	76.4	86.1	53.6	24.7	62.9	37.2	6.3	70.1	45.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.4	86.1	53.6	24.7	62.9	37.2	6.3	70.1	45.1
Queue Length 50th (ft)	129	245	211	83	141	216	0	54	166
Queue Length 95th (ft)	167	#393	301	122	#230	281	58	102	#251
Internal Link Dist (ft)		559		600		676			600
Turn Bay Length (ft)	210		90		275		275	250	
Base Capacity (vph)	749	480	466	1187	273	1104	694	160	751
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.86	0.69	0.30	0.75	0.59	0.46	0.48	0.64

Intersection Summary

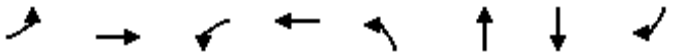
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	286	288	65	286	246	72	177	557	272	72	418	26
Future Volume (vph)	286	288	65	286	246	72	177	557	272	72	418	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	5.0	5.0	4.0	5.0	
Lane Util. Factor	0.97	1.00		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.97		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	1795		1770	3409		1770	3539	1529	1770	3508	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	1795		1770	3409		1770	3539	1529	1770	3508	
Peak-hour factor, PHF	0.85	0.85	0.85	0.89	0.89	0.89	0.86	0.86	0.86	0.93	0.93	0.93
Adj. Flow (vph)	336	339	76	321	276	81	206	648	316	77	449	28
RTOR Reduction (vph)	0	8	0	0	24	0	0	0	220	0	4	0
Lane Group Flow (vph)	336	407	0	321	333	0	206	648	96	77	473	0
Confl. Peds. (#/hr)			34			1			7			
Confl. Bikes (#/hr)			2									
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	16.0	27.2		25.4	36.6		17.8	33.5	33.5	6.9	22.6	
Effective Green, g (s)	16.0	27.2		25.4	36.6		17.8	33.5	33.5	6.9	22.6	
Actuated g/C Ratio	0.15	0.25		0.23	0.33		0.16	0.30	0.30	0.06	0.21	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)	3.0	2.0		5.0	2.0		3.0	3.0	3.0	1.0	3.0	
Lane Grp Cap (vph)	499	443		408	1134		286	1077	465	111	720	
v/s Ratio Prot	0.10	c0.23		c0.18	0.10		c0.12	0.18		0.04	c0.13	
v/s Ratio Perm									0.06			
v/c Ratio	0.67	0.92		0.79	0.29		0.72	0.60	0.21	0.69	0.66	
Uniform Delay, d1	44.5	40.3		39.8	27.1		43.7	32.6	28.4	50.5	40.1	
Progression Factor	1.58	1.56		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.4	22.6		11.1	0.1		8.6	2.5	1.0	14.1	4.6	
Delay (s)	73.7	85.4		50.8	27.2		52.4	35.1	29.4	64.6	44.8	
Level of Service	E	F		D	C		D	D	C	E	D	
Approach Delay (s)		80.2			38.4			36.6			47.5	
Approach LOS		F			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	49.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

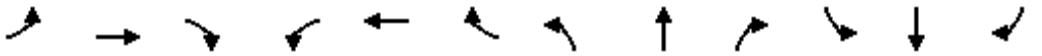
c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	91	345	231	444	15	427	644	330
v/c Ratio	0.49	0.39	0.51	0.80	0.11	0.26	0.41	0.38
Control Delay	43.4	25.5	36.9	38.0	37.4	7.8	18.6	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.4	25.5	36.9	38.0	37.4	7.8	18.6	4.1
Queue Length 50th (ft)	45	70	57	193	7	34	118	0
Queue Length 95th (ft)	85	105	84	#318	25	62	208	59
Internal Link Dist (ft)		718		559		185	480	
Turn Bay Length (ft)	80		210		95			
Base Capacity (vph)	237	983	586	570	172	1661	1582	863
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.35	0.39	0.78	0.09	0.26	0.41	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



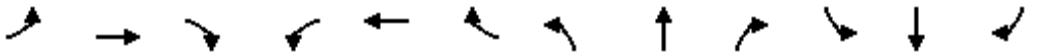
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	278	22	199	290	92	13	190	186	0	631	323
Future Volume (vph)	79	278	22	199	290	92	13	190	186	0	631	323
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		0.97	1.00		1.00	0.95			0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Frt	1.00	0.99		1.00	0.96		1.00	0.93			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770	3493		3433	1789		1770	3277			3539	1524
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (perm)	1770	3493		3433	1789		1770	3277			3539	1524
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.88	0.88	0.88	0.98	0.98	0.98
Adj. Flow (vph)	91	320	25	231	337	107	15	216	211	0	644	330
RTOR Reduction (vph)	0	7	0	0	14	0	0	113	0	0	0	199
Lane Group Flow (vph)	91	338	0	231	430	0	15	314	0	0	644	131
Confl. Peds. (#/hr)			19			2						9
Turn Type	Prot	NA		Prot	NA		Prot	NA			NA	Perm
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases												6
Actuated Green, G (s)	7.4	21.3		10.8	24.7		1.3	37.9			32.6	32.6
Effective Green, g (s)	7.4	21.3		10.8	24.7		1.3	37.9			32.6	32.6
Actuated g/C Ratio	0.09	0.26		0.13	0.30		0.02	0.46			0.40	0.40
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	2.0	4.0		3.0	4.0		2.0	4.0			4.0	4.0
Lane Grp Cap (vph)	159	907		452	538		28	1514			1406	605
v/s Ratio Prot	0.05	0.10		c0.07	c0.24		c0.01	0.10			c0.18	
v/s Ratio Perm												0.09
v/c Ratio	0.57	0.37		0.51	0.80		0.54	0.21			0.46	0.22
Uniform Delay, d1	35.8	24.9		33.1	26.4		40.1	13.1			18.2	16.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.1	0.4		1.0	8.6		9.5	0.3			1.1	0.8
Delay (s)	38.9	25.2		34.1	35.0		49.6	13.4			19.3	17.1
Level of Service	D	C		C	C		D	B			B	B
Approach Delay (s)		28.1			34.7			14.7			18.5	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	82.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	80	13	312	110	565	387
v/c Ratio	0.21	0.07	0.19	0.14	0.65	0.28
Control Delay	24.6	24.9	9.7	2.8	26.8	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.6	24.9	9.7	2.8	26.8	4.5
Queue Length 50th (ft)	13	4	32	0	98	29
Queue Length 95th (ft)	30	18	53	21	#177	121
Internal Link Dist (ft)	293		441			421
Turn Bay Length (ft)		100		100	155	
Base Capacity (vph)	806	354	1651	797	866	1403
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.04	0.19	0.14	0.65	0.28

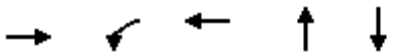
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



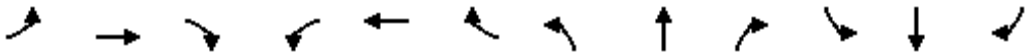
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	39	2	0	0	0	12	281	99	525	333	27
Future Volume (vph)	32	39	2	0	0	0	12	281	99	525	333	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.95					1.00	0.95	1.00	0.97	1.00	
Frpb, ped/bikes		1.00					1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00					1.00	1.00	1.00	1.00	1.00	
Frt		1.00					1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.98					0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3450					1770	3539	1583	3433	1838	
Flt Permitted		0.98					0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3450					1770	3539	1583	3433	1838	
Peak-hour factor, PHF	0.91	0.91	0.91	0.25	0.25	0.25	0.90	0.90	0.90	0.93	0.93	0.93
Adj. Flow (vph)	35	43	2	0	0	0	13	312	110	565	358	29
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	60	0	3	0
Lane Group Flow (vph)	0	78	0	0	0	0	13	312	50	565	384	0
Confl. Peds. (#/hr)												7
Turn Type	Split	NA					Prot	NA	Perm	Prot	NA	
Protected Phases	4	4					5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		5.7					1.4	27.2	27.2	15.1	40.9	
Effective Green, g (s)		5.7					1.4	27.2	27.2	15.1	40.9	
Actuated g/C Ratio		0.10					0.02	0.45	0.45	0.25	0.68	
Clearance Time (s)		4.0					4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0					3.0	3.0	3.0	3.0	4.0	
Lane Grp Cap (vph)		327					41	1604	717	863	1252	
v/s Ratio Prot		c0.02					0.01	0.09		c0.16	c0.21	
v/s Ratio Perm									0.03			
v/c Ratio		0.24					0.32	0.19	0.07	0.65	0.31	
Uniform Delay, d1		25.1					28.8	9.8	9.3	20.1	3.8	
Progression Factor		1.00					1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.4					4.4	0.3	0.2	1.8	0.6	
Delay (s)		25.5					33.3	10.1	9.4	21.9	4.5	
Level of Service		C					C	B	A	C	A	
Approach Delay (s)		25.5			0.0			10.6			14.8	
Approach LOS		C			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	38.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	161	261	264	393	474
v/c Ratio	0.50	0.64	0.64	0.37	0.32
Control Delay	13.4	25.2	24.9	13.3	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	25.2	24.9	13.3	12.3
Queue Length 50th (ft)	8	70	71	38	45
Queue Length 95th (ft)	48	146	147	96	106
Internal Link Dist (ft)	524		499	480	576
Turn Bay Length (ft)		290			
Base Capacity (vph)	610	710	723	1584	1491
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.26	0.37	0.37	0.25	0.32

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	0	110	403	75	0	117	245	0	0	424	7
Future Volume (vph)	25	0	110	403	75	0	117	245	0	0	424	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.1		4.1	4.1			4.1			4.1	
Lane Util. Factor		1.00		0.95	0.95			0.95			0.95	
Frpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Frt		0.89		1.00	1.00			1.00			1.00	
Flt Protected		0.99		0.95	0.97			0.98			1.00	
Satd. Flow (prot)		1643		1681	1711			3483			3528	
Flt Permitted		0.99		0.95	0.97			0.72			1.00	
Satd. Flow (perm)		1643		1681	1711			2542			3528	
Peak-hour factor, PHF	0.84	0.84	0.84	0.91	0.91	0.91	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	30	0	131	443	82	0	127	266	0	0	466	8
RTOR Reduction (vph)	0	118	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	43	0	261	264	0	0	393	0	0	473	0
Confl. Peds. (#/hr)												8
Confl. Bikes (#/hr)												2
Turn Type	Split	NA		Split	NA		pm+pt	NA			NA	
Protected Phases	4	4		3	3		5	2			6	
Permitted Phases							2					
Actuated Green, G (s)		4.8		11.8	11.8			20.7			20.7	
Effective Green, g (s)		4.8		11.8	11.8			20.7			20.7	
Actuated g/C Ratio		0.10		0.24	0.24			0.42			0.42	
Clearance Time (s)		4.1		4.1	4.1			4.1			4.1	
Vehicle Extension (s)		1.5		1.5	1.5			2.0			2.0	
Lane Grp Cap (vph)		159		399	407			1060			1472	
v/s Ratio Prot		c0.03		c0.16	0.15						0.13	
v/s Ratio Perm								c0.15				
v/c Ratio		0.27		0.65	0.65			0.37			0.32	
Uniform Delay, d1		20.8		17.1	17.0			10.0			9.7	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.3		2.9	2.7			0.1			0.6	
Delay (s)		21.1		20.0	19.7			10.0			10.3	
Level of Service		C		B	B			B			B	
Approach Delay (s)		21.1			19.8			10.0			10.3	
Approach LOS		C			B			B			B	

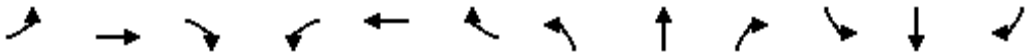
Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	49.6	Sum of lost time (s)	15.8
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	265	233	440	495	210	598	342	53	601
v/c Ratio	0.64	0.70	0.81	0.39	0.73	0.50	0.46	0.52	0.79
Control Delay	65.7	63.8	59.1	33.6	70.4	37.9	5.4	85.1	58.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.7	63.8	59.1	33.6	70.4	37.9	5.4	85.1	58.3
Queue Length 50th (ft)	121	188	384	162	185	236	0	48	275
Queue Length 95th (ft)	187	323	#711	271	298	311	69	103	375
Internal Link Dist (ft)		559		600		676			600
Turn Bay Length (ft)	210		90		275		275	250	
Base Capacity (vph)	1052	557	542	1264	542	1243	757	542	1076
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.42	0.81	0.39	0.39	0.48	0.45	0.10	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

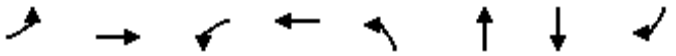


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	246	186	31	400	352	98	202	574	328	48	509	38
Future Volume (vph)	246	186	31	400	352	98	202	574	328	48	509	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	5.0	5.0	4.0	5.0	
Lane Util. Factor	0.97	1.00		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	1811		1770	3413		1770	3539	1532	1770	3502	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	1811		1770	3413		1770	3539	1532	1770	3502	
Peak-hour factor, PHF	0.93	0.93	0.93	0.91	0.91	0.91	0.96	0.96	0.96	0.91	0.91	0.91
Adj. Flow (vph)	265	200	33	440	387	108	210	598	342	53	559	42
RTOR Reduction (vph)	0	3	0	0	12	0	0	0	226	0	3	0
Lane Group Flow (vph)	265	230	0	440	483	0	210	598	116	53	598	0
Confl. Peds. (#/hr)			25			2			5			
Confl. Bikes (#/hr)			2			1						
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	16.3	24.5		41.1	49.3		22.9	45.5	45.5	6.6	29.2	
Effective Green, g (s)	16.3	24.5		41.1	49.3		22.9	45.5	45.5	6.6	29.2	
Actuated g/C Ratio	0.12	0.18		0.31	0.37		0.17	0.34	0.34	0.05	0.22	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)	3.0	2.0		5.0	2.0		3.0	3.0	3.0	1.0	3.0	
Lane Grp Cap (vph)	415	329		540	1249		300	1195	517	86	759	
v/s Ratio Prot	0.08	c0.13		c0.25	0.14		c0.12	0.17		0.03	c0.17	
v/s Ratio Perm									0.08			
v/c Ratio	0.64	0.70		0.81	0.39		0.70	0.50	0.22	0.62	0.79	
Uniform Delay, d1	56.4	51.6		43.3	31.5		52.7	35.5	31.9	62.8	49.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.2	5.1		10.3	0.1		7.0	0.3	0.2	8.9	5.4	
Delay (s)	59.6	56.8		53.6	31.6		59.6	35.9	32.2	71.7	55.3	
Level of Service	E	E		D	C		E	D	C	E	E	
Approach Delay (s)		58.3			42.0			39.1			56.6	
Approach LOS		E			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	46.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	134.7	Sum of lost time (s)	17.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Appendix D – Existing plus Project Conditions Intersections Level of Service Worksheets



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	81	524	198	300	10	415	602	287
v/c Ratio	0.53	0.68	0.54	0.64	0.10	0.21	0.31	0.30
Control Delay	60.3	43.9	55.0	50.4	51.6	5.4	16.0	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.3	43.9	55.0	50.4	51.6	5.4	16.0	3.2
Queue Length 50th (ft)	56	179	61	223	7	25	110	0
Queue Length 95th (ft)	103	220	m85	m307	23	48	215	53
Internal Link Dist (ft)		100		559		185	480	
Turn Bay Length (ft)	80		210		95			
Base Capacity (vph)	209	1093	592	667	160	1935	1943	961
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.48	0.33	0.45	0.06	0.21	0.31	0.30

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

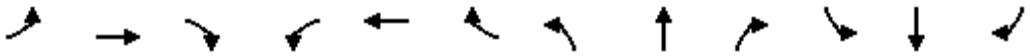
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	468	4	178	235	35	8	130	210	0	560	267
Future Volume (vph)	73	468	4	178	235	35	8	130	210	0	560	267
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		0.97	1.00		1.00	0.95			0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.98		1.00	0.91			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770	3534		3433	1823		1770	3212			3539	1515
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (perm)	1770	3534		3433	1823		1770	3212			3539	1515
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.82	0.82	0.82	0.93	0.93	0.93
Adj. Flow (vph)	81	520	4	198	261	39	10	159	256	0	602	287
RTOR Reduction (vph)	0	1	0	0	6	0	0	112	0	0	0	140
Lane Group Flow (vph)	81	523	0	198	294	0	10	303	0	0	602	147
Confl. Peds. (#/hr)			35			1						9
Confl. Bikes (#/hr)			2									
Turn Type	Prot	NA		Prot	NA		Prot	NA			NA	Perm
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases												6
Actuated Green, G (s)	8.3	24.6		11.7	28.0		1.3	61.7			56.4	56.4
Effective Green, g (s)	8.3	24.6		11.7	28.0		1.3	61.7			56.4	56.4
Actuated g/C Ratio	0.08	0.22		0.11	0.25		0.01	0.56			0.51	0.51
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	2.0	4.0		3.0	4.0		2.0	4.0			4.0	4.0
Lane Grp Cap (vph)	133	790		365	464		20	1801			1814	776
v/s Ratio Prot	0.05	0.15		c0.06	c0.16		c0.01	0.09			c0.17	
v/s Ratio Perm												0.10
v/c Ratio	0.61	0.66		0.54	0.63		0.50	0.17			0.33	0.19
Uniform Delay, d1	49.3	38.9		46.6	36.4		54.0	11.7			15.7	14.5
Progression Factor	1.00	1.00		1.08	1.25		1.00	1.00			1.00	1.00
Incremental Delay, d2	5.3	2.3		1.4	2.8		7.0	0.2			0.5	0.5
Delay (s)	54.6	41.2		51.8	48.3		61.0	11.9			16.2	15.0
Level of Service	D	D		D	D		E	B			B	B
Approach Delay (s)		43.0			49.7			13.1			15.8	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	29.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

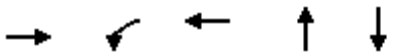
Lane Group	EBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	44	58	244	46	434	415
v/c Ratio	0.12	0.26	0.12	0.05	0.63	0.32
Control Delay	23.7	26.1	8.0	0.9	26.4	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	26.1	8.0	0.9	26.4	6.6
Queue Length 50th (ft)	7	19	24	0	73	64
Queue Length 95th (ft)	12	47	42	5	113	136
Internal Link Dist (ft)	293		441			421
Turn Bay Length (ft)		100		100	155	
Base Capacity (vph)	566	354	1981	926	692	1303
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.16	0.12	0.05	0.63	0.32

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	6	2	0	0	0	52	220	41	412	288	106
Future Volume (vph)	18	6	2	0	0	0	52	220	41	412	288	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.95					1.00	0.95	1.00	0.97	1.00	
Frpb, ped/bikes		1.00					1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes		1.00					1.00	1.00	1.00	1.00	1.00	
Frt		0.99					1.00	1.00	0.85	1.00	0.96	
Flt Protected		0.97					0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3384					1770	3539	1583	3433	1773	
Flt Permitted		0.97					0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3384					1770	3539	1583	3433	1773	
Peak-hour factor, PHF	0.59	0.59	0.59	0.25	0.25	0.25	0.90	0.90	0.90	0.95	0.95	0.95
Adj. Flow (vph)	31	10	3	0	0	0	58	244	46	434	303	112
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	21	0	14	0
Lane Group Flow (vph)	0	41	0	0	0	0	58	244	25	434	401	0
Confl. Peds. (#/hr)												7
Turn Type	Split	NA					Prot	NA	Perm	Prot	NA	
Protected Phases	4	4					5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		4.0					5.1	32.0	32.0	12.0	38.9	
Effective Green, g (s)		4.0					5.1	32.0	32.0	12.0	38.9	
Actuated g/C Ratio		0.07					0.08	0.53	0.53	0.20	0.65	
Clearance Time (s)		4.0					4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0					3.0	3.0	3.0	3.0	4.0	
Lane Grp Cap (vph)		225					150	1887	844	686	1149	
v/s Ratio Prot		c0.01					0.03	0.07		c0.13	c0.23	
v/s Ratio Perm									0.02			
v/c Ratio		0.18					0.39	0.13	0.03	0.63	0.35	
Uniform Delay, d1		26.5					26.0	7.0	6.6	22.0	4.8	
Progression Factor		1.00					1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.4					1.7	0.1	0.1	1.9	0.8	
Delay (s)		26.9					27.6	7.2	6.7	23.9	5.6	
Level of Service		C					C	A	A	C	A	
Approach Delay (s)		26.9			0.0			10.5			15.0	
Approach LOS		C			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	196	206	209	300	406
v/c Ratio	0.54	0.60	0.61	0.25	0.28
Control Delay	10.7	25.6	25.5	11.1	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	25.6	25.5	11.1	10.9
Queue Length 50th (ft)	2	53	54	25	34
Queue Length 95th (ft)	39	113	114	64	79
Internal Link Dist (ft)	524		499	480	576
Turn Bay Length (ft)		290			
Base Capacity (vph)	635	701	710	1737	1472
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.31	0.29	0.29	0.17	0.28

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	0	157	324	41	0	68	202	0	0	351	6
Future Volume (vph)	6	0	157	324	41	0	68	202	0	0	351	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.1		4.1	4.1			4.1			4.1	
Lane Util. Factor		1.00		0.95	0.95			0.95			0.95	
Frpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Frt		0.87		1.00	1.00			1.00			1.00	
Flt Protected		1.00		0.95	0.96			0.99			1.00	
Satd. Flow (prot)		1617		1681	1704			3495			3528	
Flt Permitted		1.00		0.95	0.96			0.80			1.00	
Satd. Flow (perm)		1617		1681	1704			2824			3528	
Peak-hour factor, PHF	0.83	0.83	0.83	0.88	0.88	0.88	0.90	0.90	0.90	0.88	0.88	0.88
Adj. Flow (vph)	7	0	189	368	47	0	76	224	0	0	399	7
RTOR Reduction (vph)	0	166	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	30	0	206	209	0	0	300	0	0	405	0
Confl. Peds. (#/hr)												5
Confl. Bikes (#/hr)												1
Turn Type	Split	NA		Split	NA		pm+pt	NA			NA	
Protected Phases	4	4		3	3		5	2			6	
Permitted Phases							2					
Actuated Green, G (s)		6.0		9.8	9.8			20.2			20.2	
Effective Green, g (s)		6.0		9.8	9.8			20.2			20.2	
Actuated g/C Ratio		0.12		0.20	0.20			0.42			0.42	
Clearance Time (s)		4.1		4.1	4.1			4.1			4.1	
Vehicle Extension (s)		1.5		1.5	1.5			2.0			2.0	
Lane Grp Cap (vph)		200		341	345			1181			1475	
v/s Ratio Prot		c0.02		0.12	c0.12						c0.11	
v/s Ratio Perm								0.11				
v/c Ratio		0.15		0.60	0.61			0.25			0.27	
Uniform Delay, d1		18.9		17.5	17.5			9.1			9.2	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.1		2.1	2.1			0.0			0.5	
Delay (s)		19.0		19.6	19.6			9.2			9.7	
Level of Service		B		B	B			A			A	
Approach Delay (s)		19.0			19.6			9.2			9.7	
Approach LOS		B			B			A			A	

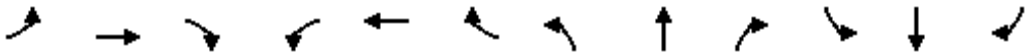
Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	48.3	Sum of lost time (s)	15.8
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	336	420	321	361	207	648	316	77	477
v/c Ratio	0.67	0.93	0.79	0.31	0.76	0.59	0.46	0.62	0.64
Control Delay	76.3	85.8	53.6	24.8	63.2	37.4	6.3	70.1	45.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.3	85.8	53.6	24.8	63.2	37.4	6.3	70.1	45.3
Queue Length 50th (ft)	129	249	211	85	142	216	0	54	166
Queue Length 95th (ft)	167	#400	301	124	#232	281	58	102	#251
Internal Link Dist (ft)		559		600		676			600
Turn Bay Length (ft)	210		90		275		275	250	
Base Capacity (vph)	749	480	466	1190	273	1097	692	160	744
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.88	0.69	0.30	0.76	0.59	0.46	0.48	0.64

Intersection Summary

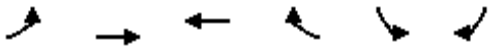
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	286	292	65	286	249	72	178	557	272	72	418	26
Future Volume (vph)	286	292	65	286	249	72	178	557	272	72	418	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	5.0	5.0	4.0	5.0	
Lane Util. Factor	0.97	1.00		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.97		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	1796		1770	3410		1770	3539	1529	1770	3508	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	1796		1770	3410		1770	3539	1529	1770	3508	
Peak-hour factor, PHF	0.85	0.85	0.85	0.89	0.89	0.89	0.86	0.86	0.86	0.93	0.93	0.93
Adj. Flow (vph)	336	344	76	321	280	81	207	648	316	77	449	28
RTOR Reduction (vph)	0	8	0	0	23	0	0	0	220	0	4	0
Lane Group Flow (vph)	336	412	0	321	338	0	207	648	96	77	473	0
Confl. Peds. (#/hr)			34			1			7			
Confl. Bikes (#/hr)			2									
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	16.0	27.4		25.4	36.8		17.8	33.3	33.3	6.9	22.4	
Effective Green, g (s)	16.0	27.4		25.4	36.8		17.8	33.3	33.3	6.9	22.4	
Actuated g/C Ratio	0.15	0.25		0.23	0.33		0.16	0.30	0.30	0.06	0.20	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)	3.0	2.0		5.0	2.0		3.0	3.0	3.0	1.0	3.0	
Lane Grp Cap (vph)	499	447		408	1140		286	1071	462	111	714	
v/s Ratio Prot	0.10	c0.23		c0.18	0.10		c0.12	0.18		0.04	c0.13	
v/s Ratio Perm									0.06			
v/c Ratio	0.67	0.92		0.79	0.30		0.72	0.61	0.21	0.69	0.66	
Uniform Delay, d1	44.5	40.3		39.8	27.0		43.8	32.7	28.5	50.5	40.3	
Progression Factor	1.58	1.54		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.4	23.2		11.1	0.1		8.8	2.5	1.0	14.1	4.8	
Delay (s)	73.7	85.2		50.8	27.1		52.5	35.3	29.5	64.6	45.1	
Level of Service	E	F		D	C		D	D	C	E	D	
Approach Delay (s)		80.1			38.3			36.8			47.8	
Approach LOS		F			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	49.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		

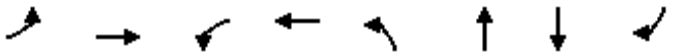
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	535	504	6	14	1
Future Volume (Veh/h)	0	535	504	6	14	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	582	548	7	15	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			180			
pX, platoon unblocked	0.86				0.86	0.86
vC, conflicting volume	555				1134	552
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	402				1074	398
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				93	100
cM capacity (veh/h)	995				209	561

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	582	555	16
Volume Left	0	0	15
Volume Right	0	7	1
cSH	995	1700	218
Volume to Capacity	0.00	0.33	0.07
Queue Length 95th (ft)	0	0	6
Control Delay (s)	0.0	0.0	22.8
Lane LOS			C
Approach Delay (s)	0.0	0.0	22.8
Approach LOS			C

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		38.2%	ICU Level of Service A
Analysis Period (min)		15	



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	95	351	231	454	16	427	644	336
v/c Ratio	0.51	0.39	0.51	0.82	0.12	0.26	0.41	0.39
Control Delay	43.9	25.3	36.9	38.9	37.5	7.9	18.8	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.9	25.3	36.9	38.9	37.5	7.9	18.8	4.1
Queue Length 50th (ft)	47	70	57	197	8	35	121	0
Queue Length 95th (ft)	88	107	84	#330	26	62	208	59
Internal Link Dist (ft)		100		559		185	480	
Turn Bay Length (ft)	80		210		95			
Base Capacity (vph)	237	990	586	572	172	1650	1568	862
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.35	0.39	0.79	0.09	0.26	0.41	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

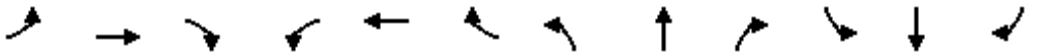
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	281	24	199	298	92	14	190	186	0	631	329
Future Volume (vph)	83	281	24	199	298	92	14	190	186	0	631	329
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		0.97	1.00		1.00	0.95			0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Frt	1.00	0.99		1.00	0.96		1.00	0.93			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770	3488		3433	1791		1770	3277			3539	1524
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (perm)	1770	3488		3433	1791		1770	3277			3539	1524
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.88	0.88	0.88	0.98	0.98	0.98
Adj. Flow (vph)	95	323	28	231	347	107	16	216	211	0	644	336
RTOR Reduction (vph)	0	8	0	0	13	0	0	114	0	0	0	204
Lane Group Flow (vph)	95	343	0	231	441	0	16	313	0	0	644	132
Confl. Peds. (#/hr)			19			2						9
Turn Type	Prot	NA		Prot	NA		Prot	NA			NA	Perm
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases												6
Actuated Green, G (s)	7.5	21.6		10.8	24.9		1.3	37.6			32.3	32.3
Effective Green, g (s)	7.5	21.6		10.8	24.9		1.3	37.6			32.3	32.3
Actuated g/C Ratio	0.09	0.26		0.13	0.30		0.02	0.46			0.39	0.39
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	2.0	4.0		3.0	4.0		2.0	4.0			4.0	4.0
Lane Grp Cap (vph)	161	918		452	543		28	1502			1394	600
v/s Ratio Prot	0.05	0.10		c0.07	c0.25		c0.01	0.10			c0.18	
v/s Ratio Perm												0.09
v/c Ratio	0.59	0.37		0.51	0.81		0.57	0.21			0.46	0.22
Uniform Delay, d1	35.8	24.7		33.1	26.4		40.1	13.3			18.4	16.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.8	0.4		1.0	9.4		16.3	0.3			1.1	0.8
Delay (s)	39.6	25.0		34.1	35.8		56.4	13.6			19.5	17.3
Level of Service	D	C		C	D		E	B			B	B
Approach Delay (s)		28.1			35.2			15.1			18.8	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	82.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	80	13	313	110	567	387
v/c Ratio	0.21	0.07	0.19	0.14	0.65	0.28
Control Delay	24.6	24.9	9.8	2.8	26.8	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.6	24.9	9.8	2.8	26.8	4.5
Queue Length 50th (ft)	13	4	32	0	98	29
Queue Length 95th (ft)	30	18	53	21	#178	121
Internal Link Dist (ft)	293		441			421
Turn Bay Length (ft)		100		100	155	
Base Capacity (vph)	806	354	1651	797	866	1403
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.04	0.19	0.14	0.65	0.28

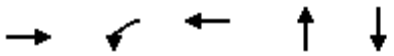
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	39	2	0	0	0	12	282	99	527	333	27
Future Volume (vph)	32	39	2	0	0	0	12	282	99	527	333	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.95					1.00	0.95	1.00	0.97	1.00	
Frpb, ped/bikes		1.00					1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00					1.00	1.00	1.00	1.00	1.00	
Frt		1.00					1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.98					0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3450					1770	3539	1583	3433	1838	
Flt Permitted		0.98					0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3450					1770	3539	1583	3433	1838	
Peak-hour factor, PHF	0.91	0.91	0.91	0.25	0.25	0.25	0.90	0.90	0.90	0.93	0.93	0.93
Adj. Flow (vph)	35	43	2	0	0	0	13	313	110	567	358	29
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	60	0	3	0
Lane Group Flow (vph)	0	78	0	0	0	0	13	313	50	567	384	0
Confl. Peds. (#/hr)												7
Turn Type	Split	NA					Prot	NA	Perm	Prot	NA	
Protected Phases	4	4					5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)		5.7					1.4	27.2	27.2	15.1	40.9	
Effective Green, g (s)		5.7					1.4	27.2	27.2	15.1	40.9	
Actuated g/C Ratio		0.10					0.02	0.45	0.45	0.25	0.68	
Clearance Time (s)		4.0					4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0					3.0	3.0	3.0	3.0	4.0	
Lane Grp Cap (vph)		327					41	1604	717	863	1252	
v/s Ratio Prot		c0.02					0.01	0.09		c0.17	c0.21	
v/s Ratio Perm									0.03			
v/c Ratio		0.24					0.32	0.20	0.07	0.66	0.31	
Uniform Delay, d1		25.1					28.8	9.8	9.3	20.1	3.8	
Progression Factor		1.00					1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.4					4.4	0.3	0.2	1.8	0.6	
Delay (s)		25.5					33.3	10.1	9.4	21.9	4.5	
Level of Service		C					C	B	A	C	A	
Approach Delay (s)		25.5			0.0			10.6			14.9	
Approach LOS		C			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	38.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	162	264	265	398	475
v/c Ratio	0.50	0.65	0.64	0.37	0.32
Control Delay	13.4	25.3	24.8	13.4	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	25.3	24.8	13.4	12.4
Queue Length 50th (ft)	8	71	71	39	45
Queue Length 95th (ft)	48	148	147	97	107
Internal Link Dist (ft)	524		499	480	576
Turn Bay Length (ft)		290			
Base Capacity (vph)	610	709	722	1584	1489
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.27	0.37	0.37	0.25	0.32

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	0	111	407	75	0	117	249	0	0	425	7
Future Volume (vph)	25	0	111	407	75	0	117	249	0	0	425	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.1		4.1	4.1			4.1			4.1	
Lane Util. Factor		1.00		0.95	0.95			0.95			0.95	
Frpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Frt		0.89		1.00	1.00			1.00			1.00	
Flt Protected		0.99		0.95	0.97			0.98			1.00	
Satd. Flow (prot)		1643		1681	1711			3484			3528	
Flt Permitted		0.99		0.95	0.97			0.72			1.00	
Satd. Flow (perm)		1643		1681	1711			2546			3528	
Peak-hour factor, PHF	0.84	0.84	0.84	0.91	0.91	0.91	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	30	0	132	447	82	0	127	271	0	0	467	8
RTOR Reduction (vph)	0	119	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	43	0	264	265	0	0	398	0	0	474	0
Confl. Peds. (#/hr)												8
Confl. Bikes (#/hr)												2
Turn Type	Split	NA		Split	NA		pm+pt	NA			NA	
Protected Phases	4	4		3	3		5	2			6	
Permitted Phases							2					
Actuated Green, G (s)		4.8		11.9	11.9			20.7			20.7	
Effective Green, g (s)		4.8		11.9	11.9			20.7			20.7	
Actuated g/C Ratio		0.10		0.24	0.24			0.42			0.42	
Clearance Time (s)		4.1		4.1	4.1			4.1			4.1	
Vehicle Extension (s)		1.5		1.5	1.5			2.0			2.0	
Lane Grp Cap (vph)		158		402	409			1060			1469	
v/s Ratio Prot		c0.03		c0.16	0.15						0.13	
v/s Ratio Perm								c0.16				
v/c Ratio		0.27		0.66	0.65			0.38			0.32	
Uniform Delay, d1		20.8		17.1	17.0			10.0			9.8	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.3		2.9	2.6			0.1			0.6	
Delay (s)		21.2		20.0	19.7			10.1			10.4	
Level of Service		C		B	B			B			B	
Approach Delay (s)		21.2			19.8			10.1			10.4	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	49.7	Sum of lost time (s)	15.8
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	265	236	440	500	214	598	342	53	601
v/c Ratio	0.64	0.71	0.81	0.40	0.73	0.50	0.46	0.52	0.79
Control Delay	66.1	64.4	59.8	34.0	70.7	37.9	5.4	85.5	58.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.1	64.4	59.8	34.0	70.7	37.9	5.4	85.5	58.6
Queue Length 50th (ft)	121	192	386	165	190	236	0	48	275
Queue Length 95th (ft)	188	330	#718	276	304	312	69	104	380
Internal Link Dist (ft)		559		600		676			600
Turn Bay Length (ft)	210		90		275		275	250	
Base Capacity (vph)	1047	554	540	1263	540	1245	758	540	1072
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.43	0.81	0.40	0.40	0.48	0.45	0.10	0.56

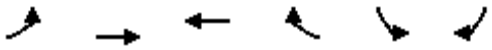
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	246	189	31	400	357	98	205	574	328	48	509	38
Future Volume (vph)	246	189	31	400	357	98	205	574	328	48	509	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	5.0	5.0	4.0	5.0	
Lane Util. Factor	0.97	1.00		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	1812		1770	3414		1770	3539	1531	1770	3502	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	1812		1770	3414		1770	3539	1531	1770	3502	
Peak-hour factor, PHF	0.93	0.93	0.93	0.91	0.91	0.91	0.96	0.96	0.96	0.91	0.91	0.91
Adj. Flow (vph)	265	203	33	440	392	108	214	598	342	53	559	42
RTOR Reduction (vph)	0	3	0	0	11	0	0	0	226	0	3	0
Lane Group Flow (vph)	265	233	0	440	489	0	214	598	116	53	598	0
Confl. Peds. (#/hr)			25			2			5			
Confl. Bikes (#/hr)			2			1						
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	16.3	24.6		41.1	49.4		23.4	45.9	45.9	6.7	29.2	
Effective Green, g (s)	16.3	24.6		41.1	49.4		23.4	45.9	45.9	6.7	29.2	
Actuated g/C Ratio	0.12	0.18		0.30	0.37		0.17	0.34	0.34	0.05	0.22	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)	3.0	2.0		5.0	2.0		3.0	3.0	3.0	1.0	3.0	
Lane Grp Cap (vph)	413	329		537	1246		306	1200	519	87	755	
v/s Ratio Prot	0.08	c0.13		c0.25	0.14		c0.12	0.17		0.03	c0.17	
v/s Ratio Perm									0.08			
v/c Ratio	0.64	0.71		0.82	0.39		0.70	0.50	0.22	0.61	0.79	
Uniform Delay, d1	56.7	52.0		43.7	31.8		52.6	35.5	32.0	63.0	50.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.4	5.6		10.6	0.1		6.8	0.3	0.2	8.0	5.7	
Delay (s)	60.1	57.6		54.3	31.9		59.5	35.9	32.2	71.0	55.9	
Level of Service	E	E		D	C		E	D	C	E	E	
Approach Delay (s)		58.9			42.4			39.2			57.1	
Approach LOS		E			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	46.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	135.3	Sum of lost time (s)	17.0
Intersection Capacity Utilization	82.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	379	626	15	9	1
Future Volume (Veh/h)	1	379	626	15	9	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	412	680	16	10	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			180			
pX, platoon unblocked	0.78				0.78	0.78
vC, conflicting volume	696				1102	688
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	474				992	464
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				95	100
cM capacity (veh/h)	853				213	469

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	413	696	11
Volume Left	1	0	10
Volume Right	0	16	1
cSH	853	1700	224
Volume to Capacity	0.00	0.41	0.05
Queue Length 95th (ft)	0	0	4
Control Delay (s)	0.0	0.0	21.9
Lane LOS	A		C
Approach Delay (s)	0.0	0.0	21.9
Approach LOS			C

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		