Final Report

TRAFFIC IMPACT ANALYSIS FOR FLAHAVAN ESTATES PROJECT

Prepared for

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SECTION 1- INTRODUCTION

This traffic impact study has been prepared for the proposed Flahavan Estates Project (project) at 8841 Old Redwood Highway in the City of Cotati (city). The purpose of this study is to evaluate the potential traffic impacts associated with the project including intersection operations and access.

PROJECT DESCRIPTION

The project is to build 35 single-family homes with an access off Old Redwood Highway. Figure 1 shows project site location and vicinity. Figure 2 shows the project site plan.

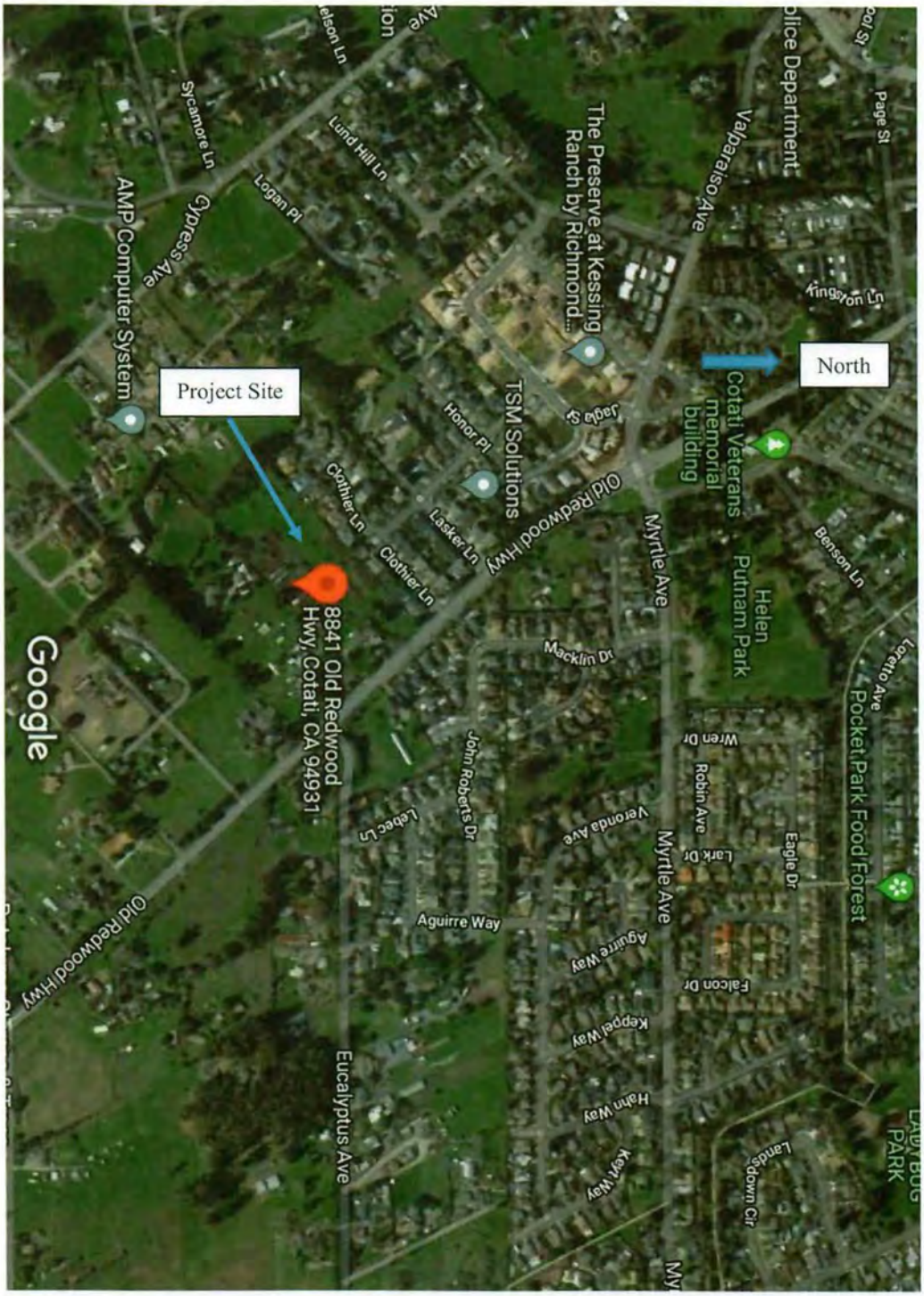
STUDY SCOPE

The traffic analysis focuses on the following study intersections:

- Old Redwood Highway/Myrtle Avenue/Valparaiso Avenue.
- Old Redwood Highway/Project's Access Street.
- Old Redwood Highway/Eucalyptus Avenue.

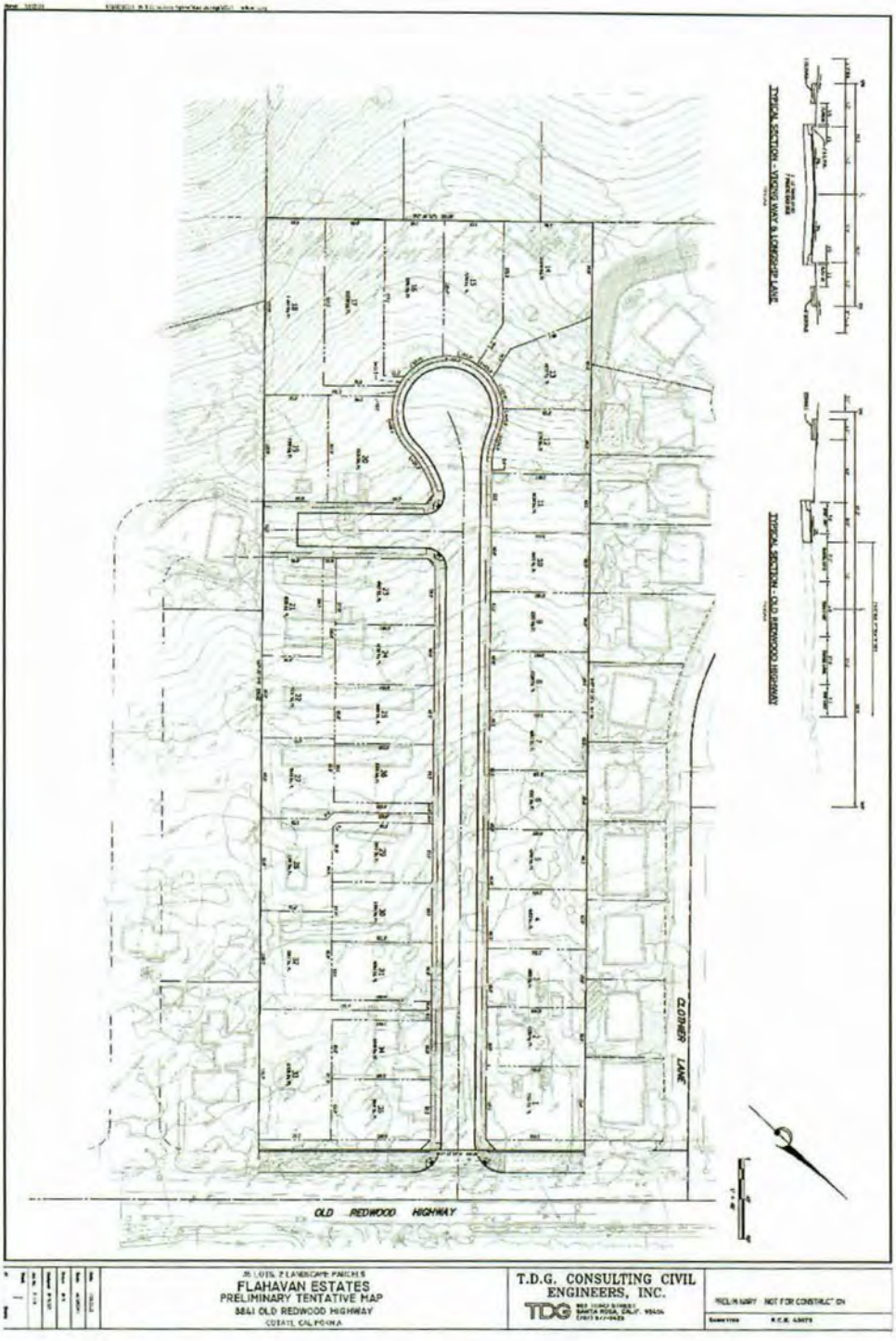
Traffic impacts are evaluated for the following traffic scenarios:

- Existing.
- Existing plus project.
- Cumulative.
- Cumulative plus project.



Source: Google Earth, 2021.
Transpedia Consulting Engineers, 2021.

Figure 1- Site Location and Vicinity.



Source: T.D.G. Consulting Civil Engineers, July 15, 2021.

Figure 2- Project Site Plan.

APPROACH AND METHODOLOGY

Traffic operations were evaluated in terms of intersection operations. Intersection operations were evaluated for weekday am and pm peak hours at the study intersections using the criteria and methodology described below.

Intersections are evaluated in terms of "level of service" (LOS), which is a measure of driving conditions and vehicle delay. LOS ranges from A (best) to F (poorest). LOS A, B and C indicate conditions where traffic can move relatively freely. LOS D describes conditions where delay is more noticeable. LOS E describes conditions where traffic volumes are at or close to capacity, resulting in significant delays. LOS F characterizes conditions where traffic demand exceeds available capacity, with very slow speeds (stop-and-go) and long delays (over a minute).

The Highway Capacity Manual (HCM) methodology was used to analyze signalized study intersections. This methodology evaluates the amount of green signal time available to each traffic approach and the total intersection capacity used by the traffic demand, and assigns a LOS based on the average control delay that the drivers would experience at the intersection during the peak hour. The criteria for the six distinct levels of service are summarized in Table 1.

Table 1- Level of Service Definitions for Signalized Intersections[1].

Level of Service	Average Control Delay per Vehicle (Seconds)	Description
A	0 – 10.0	Very low delay. Occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	10.1 – 20.0	Generally, occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS "A," causing higher levels of average delay.
C	20.1 – 35.0	These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though may still pass through the intersection without stopping.
D	35.1 – 55.0	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	55.1 – 80.0	These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.
F	> 80.0	This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

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

The unsignalized study intersections were also evaluated using the HCM methodology. This methodology separately evaluates each turning movement that yields to an opposing movement and assigns a LOS. The LOS is based on the average total delays of traffic on the minor approach waiting for an adequate gap in conflicting traffic flows. Under this methodology, the LOS is not defined for the intersection as a whole for a One-Way STOP controlled intersection. The LOS is reported for the intersection as a whole and minor street approach for Two-Way STOP controlled intersections. The LOS criteria for unsignalized intersections are shown in Table 2.

Table 2- Level of Service Definitions for Unsignalized Intersections[1].

Level of Service	Vehicle Delay (Seconds)	Description
A	0 - 10.0	Little or no delay
B	10.1 - 15.0	Short traffic delay
C	15.1 - 25.0	Average traffic delays
D	25.1 - 35.0	Long traffic delays
E	35.1 - 50.0	Very long traffic delays
F	> 50.0	Extreme delays potentially affecting other traffic movements in the intersection

STANDARDS OF SIGNIFICANCE

The city General Plan establishes a minimum vehicle Level of Service (LOS) standard of LOS D at intersections[2]. At unsignalized intersections, LOS shall be determined for both controlled movements and for the overall intersection. Controlled movements operating at LOS E or LOS F are allowable if 1) the intersection is projected to operate at LOS C or better overall, and 2) the projected traffic volume on the controlled movement is 30 vehicles or less per hour on approaches with single lanes, or on multilane approaches, 30 vehicles or less per hour on lanes serving left turns and through movements.

Level of service standards shall not apply to minor intersections comprised of only local streets. For projects within the city limits that are consistent with the General Plan, a standard of LOS E is acceptable for intersections within the boundaries of the Downtown Specific Plan.

The threshold of significance related to additional Vehicle Miles Traveled (VMT) for residential projects is, a project will cause significant additional VMT if it exceeds existing citywide average residential (home-based) VMT per capita, minus 15 percent[3].

[2] Cotati General Plan, City of Cotati, March 24, 2015.

[3] Guidelines for Analysis of Vehicle Miles Traveled (VMT), City of Cotati, September 22, 2020.

SECTION 2- EXISTING CONDITIONS

EXISTING ROADS

The major roadways in the project area are described below.

Old Redwood Highway is a north-south arterial. Posted speed limit is 35 miles per hour (mph).

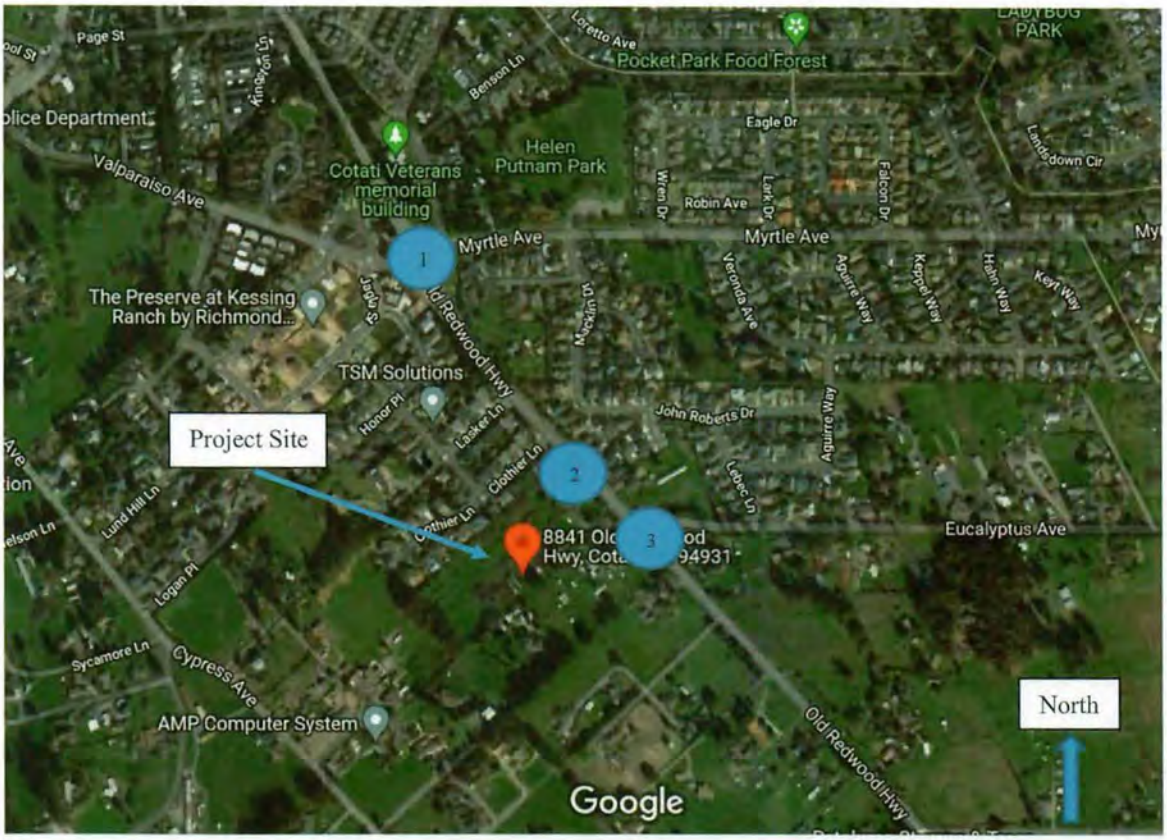
Myrtle Avenue is an east-west collector. Posted speed limit is 25 mph.

Valparaiso Avenue is an east-west collector. Posted speed limit is 25 mph.

Eucalyptus Avenue is a local road. No posted speed limit.

INTERSECTION OPERATIONS

Study intersection operations were evaluated during am and pm peak hour traffic conditions. The am peak hour peak conditions generally occur between 7:00 am and 9:00 am and the pm peak hour conditions between 4:00 pm and 6:00 pm on weekdays. Turning movement counts were collected at the study intersections during am and pm peak hours on Wednesday, December 1, 2021, as shown on Figure 3.



Source: Google, 2021.
Transpedia Consulting Engineer, 2021.
National Data & Surveying Services, December 1, 2021.

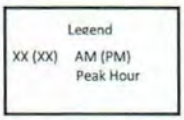


Figure 3- Existing Scenario- Intersection Geometries and Turning Movements.

EXISTING SCENARIO

Under Existing Scenario, the study intersections are expected to operate at acceptable levels of service during am and pm peak hours, as shown in Table 3.

Table 3- Intersection Operations- Existing Scenario.

Intersection		Control	Existing	
			LOS	Delay
Weekday AM Peak Hour				
1	Old Redwood Highway/Myrtle Avenue/Valparaiso Avenue	Signal	B	16.8
2	Old Redwood Highway/Project Access Street	1-Way Stop	A	0.1
	Eastbound Left/Right Turn		*(D)*	*(34.2)*
3	Old Redwood Highway/Eucalyptus Avenue	1-Way Stop	A	0.9
	Westbound Left/Right Turn		*(C)*	*(18.0)*
Weekday PM Peak Hour				
1	Old Redwood Highway/Myrtle Avenue/Valparaiso Avenue	Signal	B	13.5
2	Old Redwood Highway/Project Access Street	1-Way Stop	A	0.0
	Eastbound Right Turn		*(B)*	*(10.9)*
3	Old Redwood Highway/Eucalyptus Avenue	1-Way Stop	A	0.9
	Westbound Left/Right Turn		*(B)*	*(14.1)*

Source: Transpedia Consulting Engineers, 2021.
Notes: LOS = Level of Service, Delay = average delay per vehicle (seconds/vehicle), (X) = minor street LOS, (X.X) = minor street delay.

Under Existing Scenario, study intersections' turn lane storages are expected to be capable of handling 95th percentile traffic queues during am and pm peak hours, except for westbound left-turn movements during am peak hour and southbound left-turn movements during pm peak hour at the intersection of Old Redwood Highway/Myrtle Avenue/Valparaiso Avenue, as shown in Table 4.

The excess queues can be accommodated within the main through lanes. As the intersection is operating at an acceptable level of service (LOS B), no mitigations are required.

Capacity and queue analysis worksheets are included in Appendix A.

Table 4- Intersection Queues- Existing Scenario.

	Intersection Approach	Turn Lane Storage (Feet)	95th Percentile Queue- Existing (Year 2021) Scenario (Feet)	
			AM	PM
1	Old Redwood Highway/Myrtle Ave/Valparaiso Ave			
	Eastbound Left-Turn	60	13	11
	Westbound Left-Turn	90	**120**	60
	Northbound Left-Turn	100	57	59
	Northbound Right-Turn	100	13	51
	Southbound Left-Turn	100	28	**110**
	Southbound Right Turn	100	7	13
2	Old Redwood Highway/Project Access Street			
	Eastbound Left/Right Turn	125	2	0
3	Old Redwood Highway/Eucalyptus Avenue			
	Westbound Right Turn	25	19	7
	Northbound Right Turn	50	0	0
	Southbound Left Turn	75	1	3

Source: Transpedia Consulting Engineers, 2021.

SECTION 3- IMPACTS AND MITIGATION

This section presents evaluation of traffic impacts under the following scenarios:

- Existing plus project.
- Cumulative (Year 2040).
- Cumulative plus project.

PROJECT TRIP GENERATION

Trip generation is an estimate for the number of vehicles that would likely access the project during a typical weekday. The trip generation of the proposed project was estimated based on ITE rates[4]. The land use category consists of Single-Family Detached Housing (ITE Land Use Code 210) was used for the proposed project. The project would generate 302 net daily trips, of which 24 net trips (6 inbound and 18 outbound) during weekday am peak hour and 22 net trips (14 inbound and 8 outbound) during weekday pm peak hour, as shown in Table 5. However, as a conservative analysis scenario, the project trips were not reduced by existing houses trips.

Table 5- Project Trip Generation.

Land Use	Size	Daily	AM Peak Hour				PM Peak Hour			
			In/Out %	In	Out	Total	In/Out %	In	Out	Total
Existing Houses	3 SFD	28	25%/75%	0	2	2	63%/37%	2	1	3
Flahavan Estates	35 SFD	330	25%/75%	6	20	26	63%/37%	16	9	25
Net Trips		**302**		**6**	**18**	**24**		**14**	**8**	**22**

Sources: Transpedia Consulting Engineers, 2021.
Trip Generation, Institute of Transportation Engineers, 10th Edition, September 2017.
Notes: SFD = Single-Family Detached Housing (ITE Land Use Code 210) – daily = 9.44, AM = 0.74, PM = 0.99 trips/SFD.

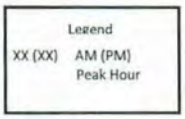
PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

Trip distribution simulates the geographical pattern of travel, matching trips generated by one type of land use (e.g., residential, or commercial) with trips attracted by other types of land uses (e.g., employment, shopping, and education). This traffic study assumed the following trip distribution, as shown in Figure 4:

- To/from Old Redwood Highway North- am peak hour: 37%, pm peak hour: 30%.
- To/from Old Redwood Highway South- am peak hour: 31%, pm peak hour: 51%.
- To/from Valparaiso Avenue West- am peak hour: 6%, pm peak hour: 7%.
- To/from Myrtle Avenue East- am peak hour: 24%, pm peak hour: 11%.
- To/from Eucalyptus Avenue East- am peak hour: 2%, pm peak hour: 1%.

[4] Trip Generation, Institute of Transportation Engineers, 10th Edition, September 2017.

Source: Google, 2021.
Transpedia Consulting Engineer, 2021.



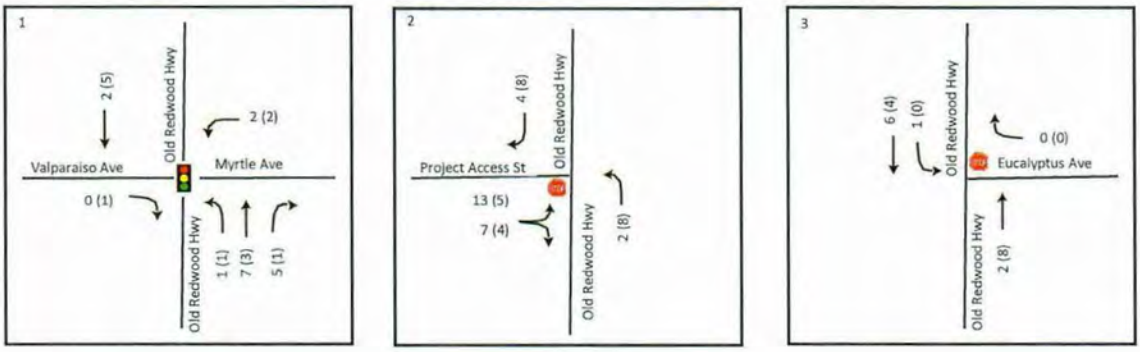


Figure 4- Project Trip Distribution and Assignment.

EXISTING PLUS PROJECT SCENARIO

Traffic that would be generated by the project was added to Existing Scenario to obtain the Existing Plus Project Scenario, as shown in Figure 5. Under Existing Plus Project Scenario, the study intersections are expected to continue to operate at acceptable levels of service during am and pm peak hours, as shown in Table 6. The project is expected to have insignificant impact on intersections traffic delays (0.8 seconds per vehicle delay increase in the worst-case scenario).

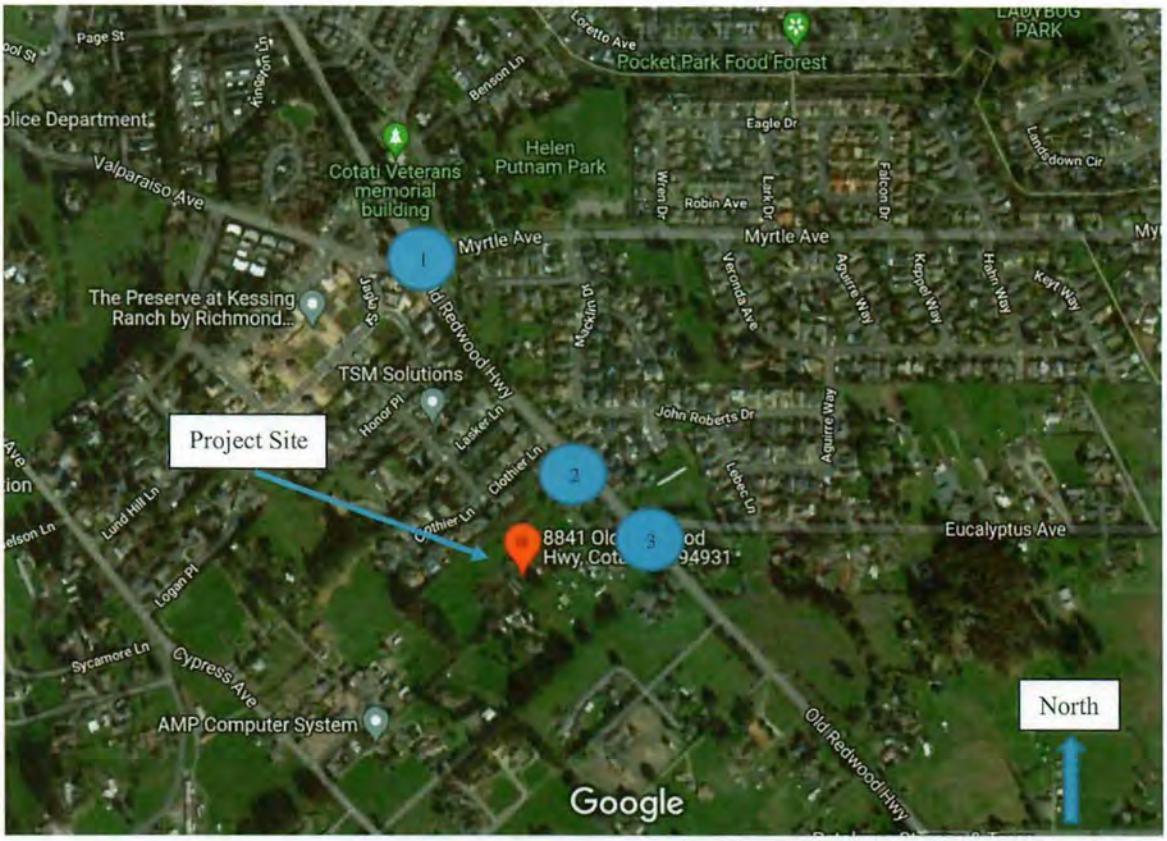
However, Old Redwood Highway was recently widened and restriped to provide a center turn lane between Eucalyptus Avenue and project's southern border. It is recommended to widen and restripe Old Redwood Highway, between project's southern border and Clothier Lane, to provide a center turn lane, which is expected to improve LOS of traffic exiting project's access street.

Table 6- Intersection Operations- Existing Plus Project Scenario.

Intersection		Control	Existing		Existing + Project	
			LOS	Delay	LOS	Delay
Weekday AM Peak Hour						
1	Old Redwood Highway/Myrtle Ave/Valparaiso Ave	Signal	B	16.8	B	17.0
2	Old Redwood Highway/Project Access Street	1-Way Stop	A	0.1	A	0.9
	Eastbound Left/Right Turn		*(D)*	*(34.2)*	*(F)*	*(51.1)*[5]
	Widen/Restripe Old Redwood Highway to Provide Center Turn Lane		*NA*	*NA*	*(C)*	*(19.4)*
3	Old Redwood Highway/Eucalyptus Ave	1-Way Stop	A	0.9	A	0.9
	Westbound Left/Right Turn		*(C)*	*(18.0)*	*(C)*	*(18.2)*
Weekday PM Peak Hour						
1	Old Redwood Highway/Myrtle Ave/Valparaiso Ave	Signal	B	13.5	B	13.6
2	Old Redwood Highway/Project Access Street	1-Way Stop	A	0.0	A	0.3
	Eastbound Left/Right Turn		*(B)*	*(10.9)*	*(C)*	*(16.9)*
	Widen/Restripe Old Redwood Highway to Provide Center Turn Lane		*NA*	*NA*	*(B)*	*(12.4)*
3	Old Redwood Highway/Eucalyptus Ave	1-Way Stop	A	0.9	*A*	*0.9*
	Westbound Left/Right Turn		*(B)*	*(14.1)*	*(B)*	*(14.2)*

Source: Transpedia Consulting Engineers, 2021.
Notes: LOS = Level of Service, Delay = average delay per vehicle (seconds/vehicle), (X) = minor street LOS, (X.X) minor street delay, bold = unacceptable LOS, NA = not applicable or available.

[5] At unsignalized intersections, LOS shall be determined for both controlled movements and for the overall intersection. Controlled movements operating at LOS E or LOS F are allowable if 1) the intersection is projected to operate at LOS C or better overall, and 2) the projected traffic volume on the controlled movement is 30 vehicles or less per hour on approaches with single lanes, or on multilane approaches, 30 vehicles or less per hour on lanes serving left turns and through movements.



Source: Google, 2021.
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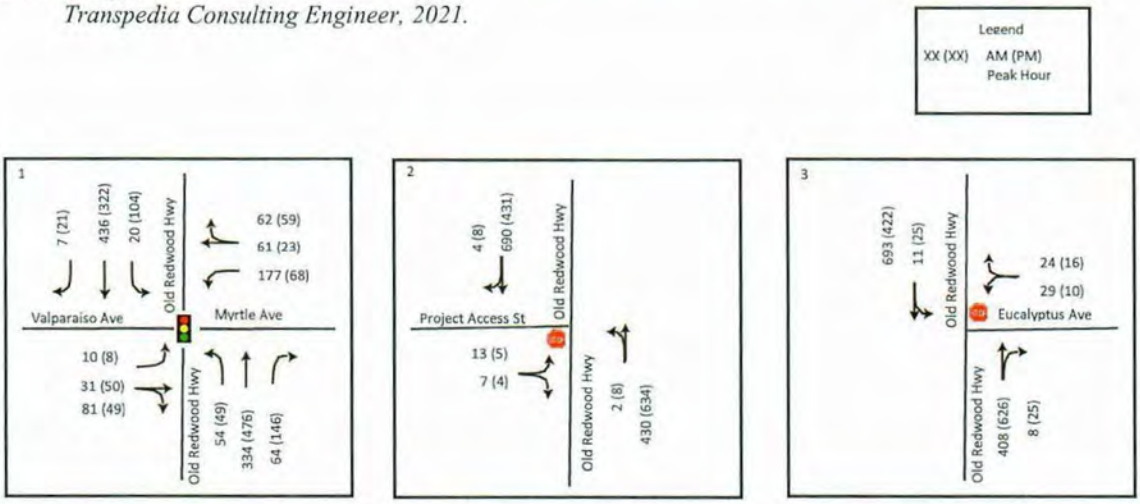


Figure 5- Existing Plus Project Scenario- Intersection Geometries and Turning Movements.

Under Existing Plus Project Scenario, turn lane storages are expected to continue be capable of handling 95th percentile traffic queues during am and pm peak hours, except for westbound left-turn movements during am peak hour and southbound left-turn movements during pm peak hour at the intersection of Old Redwood Highway/Myrtle Avenue/Valparaiso Avenue, as shown in Table 7. The project is expected to have insignificant impact on intersections current traffic queues (6-ft queue length increase in the worst-case scenario).

Capacity and queue analysis worksheets are included in Appendix A.

Table 7- Intersection Queues- Existing Plus Project Scenario.

	Intersection	Turn Lane Storage (Feet)	95th Percentile Queue (Feet)			
			Existing		Existing + Project	
			AM	PM	AM	PM
1	Old Redwood Highway/Myrtle Ave/Valparaiso Ave					
	Eastbound Left-Turn	60	13	11	14	11
	Westbound Left-Turn	90	**120**	60	**126**	61
	Northbound Left-Turn	100	57	59	59	60
	Northbound Right-Turn	100	13	51	13	52
	Southbound Left-Turn	100	28	**110**	28	**110**
	Southbound Right Turn	100	7	13	7	13
2	Old Redwood Highway/Project Access Street					
	Eastbound Left/Right Turn	125	2	0	24	3
	Widen/Restripe Old Redwood Highway to Provide Center Turn Lane		NA	NA	8	2
3	Old Redwood Highway/Eucalyptus Avenue					
	Westbound Right Turn	25	19	7	19	7
	Northbound Right Turn	50	0	0	0	0
	Southbound Left Turn	75	1	3	1	3

Source: Transpedia Consulting Engineers, 2021.
Notes: bold = expected queue exceeds storage capacity, NA = not applicable or available.

CUMULATIVE SCENARIO

Cumulative (Year 2040) scenario traffic volumes without project traffic were calculated using the Sonoma County Traffic Model[6], as shown in Figure 6.

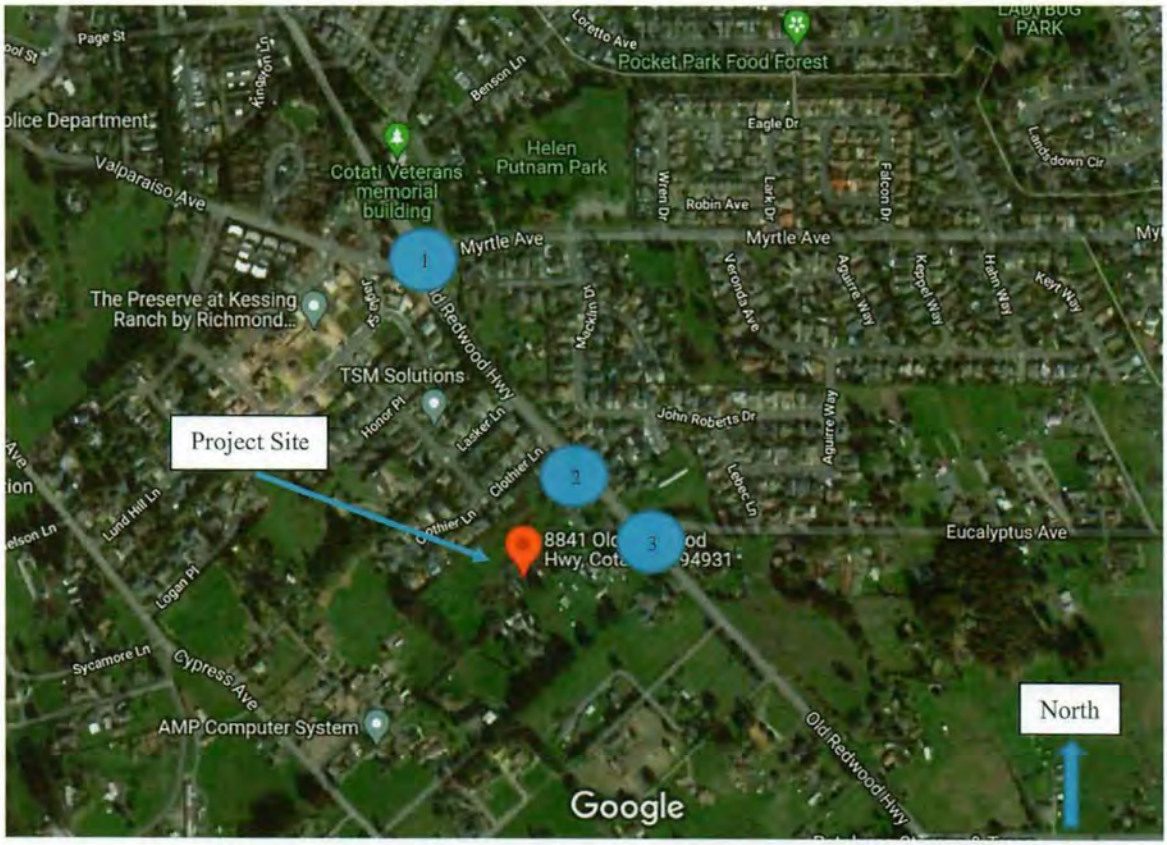
Under Cumulative Scenario, the study intersections are expected to operate at acceptable levels of service during am and pm peak hours, as shown in Table 8.

Table 8- Intersection Operations- Cumulative Scenario.

Intersection		Control	Cumulative	
			LOS	Delay
Weekday AM Peak Hour				
1	Old Redwood Highway/Myrtle Avenue/Valparaiso Avenue	Signal	C	28.9
2	Old Redwood Highway/Project Access Street	1-Way Stop	A	0.2
	Eastbound Left/Right Turn		*(F)*	*(108.4)*[5]
3	Old Redwood Highway/Eucalyptus Avenue	1-Way Stop	A	1.4
	Westbound Left/Right Turn		*(D)*	*(29.1)*
Weekday PM Peak Hour				
1	Old Redwood Highway/Myrtle Avenue/Valparaiso Avenue	Signal	B	16.6
2	Old Redwood Highway/Project Access Street	1-Way Stop	A	0.0
	Eastbound Right Turn		*(B)*	*(11.6)*
3	Old Redwood Highway/Eucalyptus Avenue	1-Way Stop	A	1.1
	Westbound Left/Right Turn		*(C)*	*(16.9)*

Source: Transpedia Consulting Engineers, 2021.
Note: Delay is average delay in seconds per vehicle; LOS = Level of Service, (X) = Minor Street LOS; (X.X) = Minor Street delay.

[6] Sonoma County Travel Model Update, Validation Report, Sonoma County Transportation Authority, December 2019.



Source: Google, 2021.
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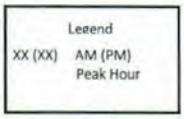


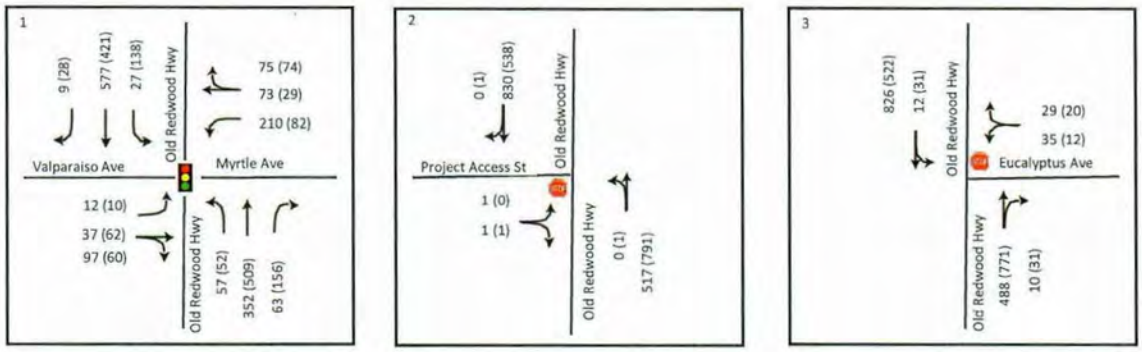


Figure 6- Cumulative Scenario- Intersection Geometries and Turning Movements.

Under Cumulative Scenario, turn lane storages are expected to be capable of handling 95th percentile traffic queues during am and pm peak hours, except for westbound left-turn movements during am peak hour and southbound left-turn movements during pm peak hour at the intersection of Old Redwood Highway/Myrtle Avenue/Valparaiso Avenue; and westbound right-turn movements during am peak hour at Old Redwood Highway/Eucalyptus Avenue intersection , as shown in Table 9.

Capacity and queue analysis worksheets are included in Appendix A.

Table 9- Intersection Queues- Cumulative Scenario.

	Intersection Approach	Turn Lane Storage (Feet)	95th Percentile Queue- Existing (Year 2021) Scenario (Feet)	
			AM	PM
1	Old Redwood Highway/Myrtle Ave/Valparaiso Ave			
	Eastbound Left-Turn	60	19	13
	Westbound Left-Turn	90	**208**	73
	Northbound Left-Turn	100	79	62
	Northbound Right-Turn	100	19	57
	Southbound Left-Turn	100	43	**159**
	Southbound Right Turn	100	10	18
2	Old Redwood Highway/Project Access Street			
	Eastbound Left/Right Turn	125	6	0
3	Old Redwood Highway/Eucalyptus Avenue			
	Westbound Right Turn	25	**41**	11
	Northbound Right Turn	50	0	0
	Southbound Left Turn	75	2	5

Source: Transpedia Consulting Engineers, 2021.

CUMULATIVE PLUS PROJECT SCENARIO

Traffic that would be generated by the project was added to the Cumulative Scenario to obtain the Cumulative Plus Project Scenario, as shown in Figure 7.

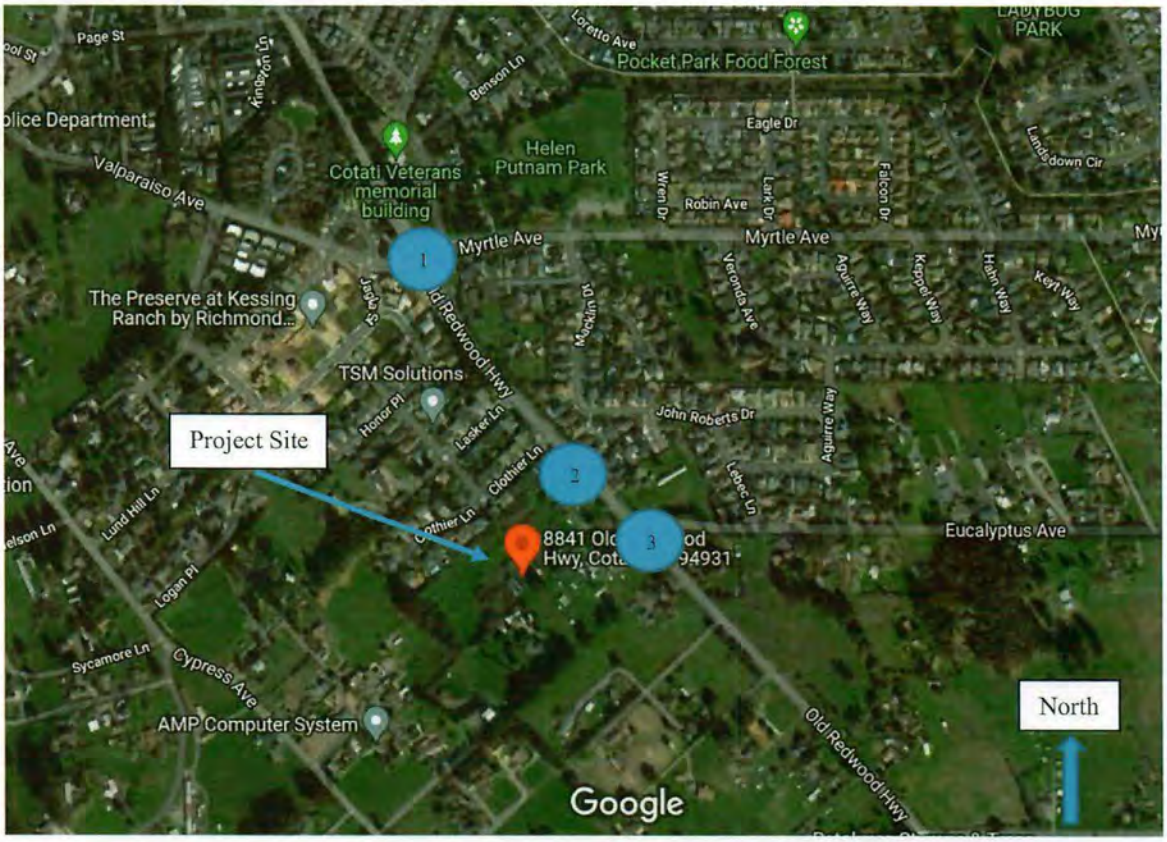
Under Cumulative Plus Project Scenario, the study intersections are expected to continue to operate at acceptable levels of service during am and pm peak hours, as shown in Table 10. The project is expected to have insignificant impact on intersections traffic delays (4.8 seconds per vehicle delay increase in the worst-case scenario).

As mentioned earlier, Old Redwood Highway was recently widened and restriped to provide a center turn lane between Eucalyptus Avenue and project's southern border. It is recommended to widen and restripe Old Redwood Highway, between project's southern border and Clothier Lane, to provide a center turn lane, which is expected to improve LOS of traffic exiting project's access street.

Table 10- Intersection Operations- Cumulative Plus Project Scenario.

	Intersection	Control	Cumulative		Cumulative + Project	
			LOS	Delay	LOS	Delay
Weekday AM Peak Hour						
1	Old Redwood Highway/Myrtle Ave/Valparaiso Ave	Signal	C	28.9	C	29.1
2	Old Redwood Highway/Project Access Street	1-Way Stop	A	0.2	A	5.1
	Eastbound Left/Right Turn		*(F)*	*(108.4)*	*(F)*	*(348.6)*[5]
	Widen/Restripe Old Redwood Highway to Provide Center Turn Lane		*NA*	*NA*	*(D)*	*(29.1)*
3	Old Redwood Highway/Eucalyptus Ave	1-Way Stop	A	1.4	A	1.4
	Westbound Left/Right Turn		*(D)*	*(29.1)*	*(D)*	*(29.9)*
Weekday PM Peak Hour						
1	Old Redwood Highway/Myrtle Ave/Valparaiso Ave	Signal	B	16.6	B	16.7
2	Old Redwood Highway/Project Access Street	1-Way Stop	A	0.0	A	0.4
	Eastbound Left/Right Turn		*(B)*	*(11.6)*	*(C)*	*(22.2)*
	Widen/Restripe Old Redwood Highway to Provide Center Turn Lane		*NA*	*NA*	*(B)*	*(13.6)*
3	Old Redwood Highway/Eucalyptus Ave	1-Way Stop	A	1.1	*A*	*1.1*
	Westbound Left/Right Turn		*(C)*	*(16.9)*	*(C)*	*(17.0)*

Source: Transpedia Consulting Engineers, 2021.
Notes: LOS = Level of Service, Delay = average delay per vehicle (seconds/vehicle), (X) = minor street LOS, (X.X) minor street delay, bold = unacceptable LOS, NA = not applicable or available.



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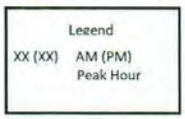

Figure 7- Cumulative Plus Project Scenario- Intersection Geometries and Turning Movements.

Under Cumulative Plus Project Scenario, turn lane storages are expected to continue to be capable of handling 95th percentile traffic queues during am and pm peak hours except for the minor eastbound approach during pm peak hour and the minor westbound approach during am and pm peak hours, as shown in Table 11. The project is expected to have insignificant impact on intersections queue lengths (3-ft in the worst-case scenario).

Capacity and queue analysis worksheets are included in Appendix A.

Table 11- Intersection Queues- Cumulative Plus Project Scenario.

	Intersection	Turn Lane Storage (Feet)	95th Percentile Queue (Feet)			
			Cumulative		Cumulative + Project	
			AM	PM	AM	PM
1	Old Redwood Highway/Myrtle Ave/Valparaiso Ave					
	Eastbound Left-Turn	60	19	13	19	13
	Westbound Left-Turn	90	**208**	73	**211**	75
	Northbound Left-Turn	100	79	62	80	64
	Northbound Right-Turn	100	19	57	20	57
	Southbound Left-Turn	100	43	**159**	43	**159**
	Southbound Right Turn	100	10	18	10	18
2	Old Redwood Highway/Project Access Street					
	Eastbound Left/Right Turn	125	6	0	78	5
	Widen/Restripe Old Redwood Highway to Provide Center Turn Lane		NA	NA	13	2
3	Old Redwood Highway/Eucalyptus Avenue					
	Westbound Right Turn	25	**41**	11	**42**	11
	Northbound Right Turn	50	0	0	2	5
	Southbound Left Turn	75	2	5	1	3

Source: Transpedia Consulting Engineers, 2021.
Notes: bold = expected queue exceeds storage capacity, NA = not applicable or available.

ALTERNATIVE TRANSPORTATION

Sonoma County Transit provides weekday and weekend service to the project vicinity. Three (3) bus stops currently located approximately 0.25 miles north of the project site, east and south of Old Redwood Highway/Myrtle Avenue/Valparaiso intersection. Route 48 (Santa Rosa, Rohnert Park, Cotati, Petaluma) and Route 10 (Cotati, Rohnert Park, Sonoma State University) provide local and regional service to/from the city[7].

[7] Sonoma County Transit Website, https://sctransit.com/all-routes/, December 28, 2021.

A bikeway includes all facilities that provide for bicycle travel. Bikeways are one element of an effort to improve bicycle safety and convenience, either to help accommodate motor vehicle and bicycle traffic on shared roadway or to complement the road system to meet needs not adequately met by roads. On-street bikeways can serve to enhance safety and convenience, especially if other commitments are made in conjunction with the establishment of bikeways, such as elimination of parking or increasing roadway width and elimination of surface irregularities and roadway obstacles.

Bicycle facilities can be classified into several general types, including:

Class I Paths: these facilities are located off-street and can serve both bicyclists and pedestrians. Recreational trails can be considered Class I facilities. Class I paths are typically 8 to 10 feet wide excluding shoulders and are generally paved.

Class II Bicycle Lanes: these facilities provide a dedicated area for bicyclists within the paved street width using striping and appropriate signage. These facilities are typically 4 to 6 feet wide.

Class III Bicycle Routes: these facilities are found along streets that do not provide sufficient width for dedicated bicycle lanes. The street is then designated as a bicycle route using signage informing drivers to expect bicyclists.

Class IV Bikeway: is a bikeway for the exclusive use of bicycles and includes a separation required between the separated bikeway and the through vehicular traffic. The separation may include, but not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking.

Within the city limits, there are existing Class II bicycle lanes on both sides of Old Redwood Highway, including in project vicinity[8]. It is recommended to incorporates these lanes in project frontage improvement design plans.

Pedestrian activity areas within the city are primarily focused in the downtown area. There is also moderate pedestrian activity along E. Cotati Avenue, Old Redwood Highway, and W. Sierra Avenue. It is recommended to construct a pedestrian sidewalk along project frontage to provide safe and continuous pedestrian connections from surrounding neighborhoods.

SITE ACCESS AND CIRCULATION

Project site access and internal circulation would be provided through a 2-way access street off Old Redwood Highway.

Sight distance at the proposed access street was evaluated based on Caltrans sight distance criteria[9]. The applicable criterion for a private access street is based on stopping sight distance. In the project vicinity, Old Redwood Highway has a posted speed limit of 35-mph, which is used for the sight distance evaluation purposes.

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[8] Cotati Bicycle and Pedestrian Master Plan, Sonoma County Transportation Authority, Adopted December 2008, Updated April 22, 2014.

[9] Highway Design Manual, Caltrans, July 1, 2020.

The sight distance was measured onsite from a 3.5-foot height at the location of the driver and 15-feet back from the road edge-line. The sight distance at the proposed access street is approximately 850 feet when looking to the north or south, which exceeds the Caltrans minimum stopping sight distance requirements of 250 feet at a design speed of 35-mph.

No vegetation or building along the project frontage shall obstruct the visibility of vehicles entering or exiting project access street onto Old Redwood Highway (clear line of sight within minimum sight distance envelope).

The internal project roadways are typical of a small residential development and consistent with city's Municipal Code (Section 17.26.030- Street and Streetscape Standards[2].

Access in and out of project site shall be designed to adequately accommodate emergency response vehicles maneuvers and emergency evacuations. Internal access street aisle and parking spaces shall also be designed to meet city standards.

It is recommended to install a stop sign at the proposed access street onto Old Redwood Highway. It is also recommended to install a pedestrian crossing pavement marking along the access street.

PARKING REQUIREMENTS AND DESIGN

The city municipal code's parking requirements for single-family dwellings is two (2) covered spaces within a garage or carport[10]. It is recommended to design the housing units to meet city code parking requirements and design standards.

[10] Cotati Municipal County Code, City of Cotati, October 12, 2021.

SECTION 4- VEHICLE MILES TRAVELED

Vehicle Miles Traveled (VMT) measures the amount of vehicular travel across the system, rather than at specific points, usually expressed per person. It measures total travel total travel and activity not congestion and captures big picture or regional impacts of travel.

As of December 2018, the Governor's Office of Planning and Research (OPR) completed an update to the CEQA Guidelines to implement the requirements of SB 743[11]. The Guidelines state that VMT must be the metric used to determine significant transportation impacts statewide effective July 1, 2020. As mentioned earlier, the city has established VMT analysis procedures to assess the project related VMT impact, as shown in Figure 8[3].

The city VMT analysis process follows VMT metrics based on information from the Sonoma County Travel Model. For residential land uses, the OPR Technical Advisory recommends using residential VMT per capita for home-based trips. Further, the city recommends using city residential VMT per capita (rather than regional VMT per capita) for analysis of residential projects.

THRESHOLDS OF SIGNFICANCE

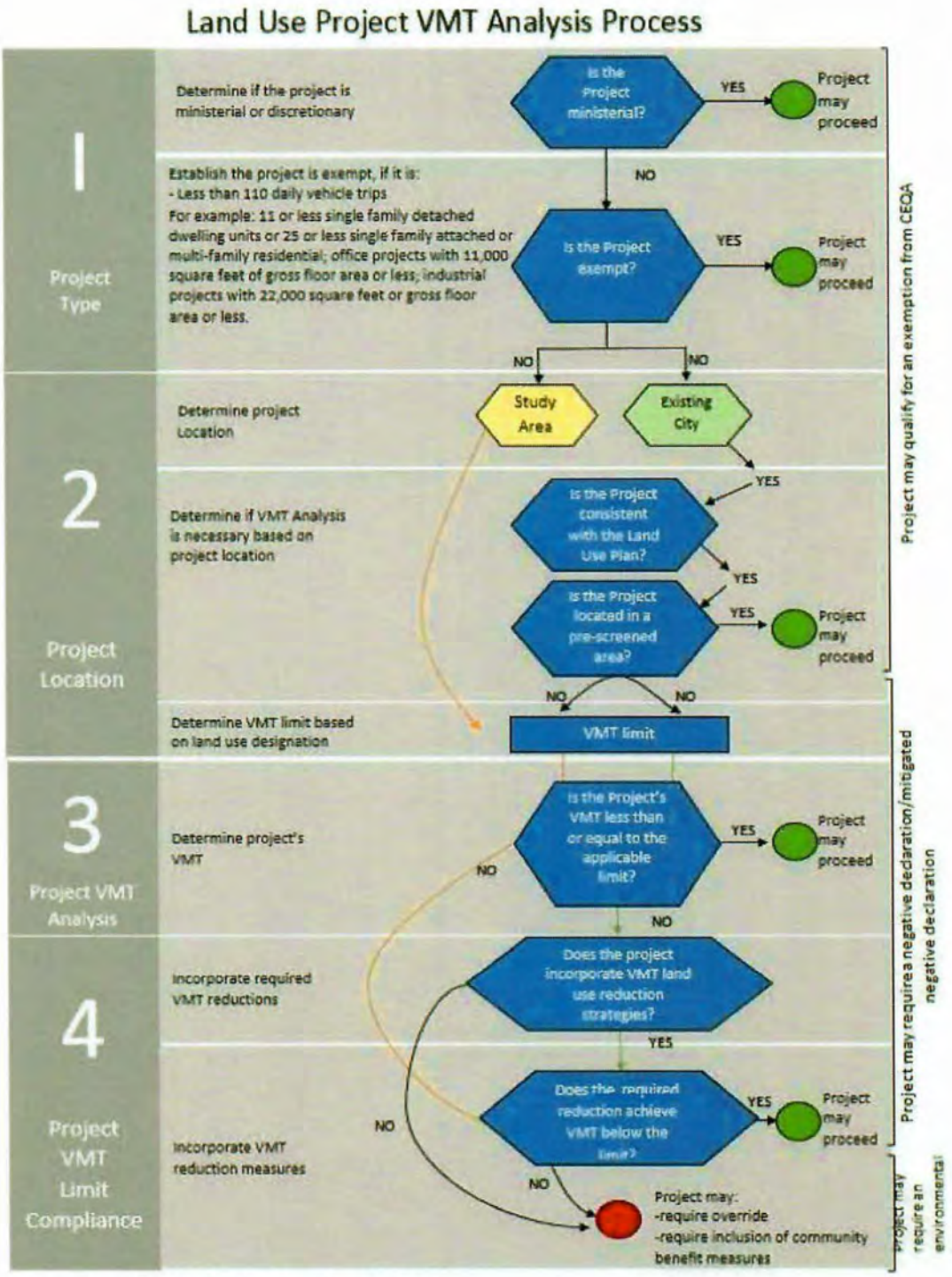
The city uses ORP Technical Advisory VMT threshold recommendations[11]. OPR recommends that VMT thresholds for residential-based land use projects be set at fifteen percent (15%) below the existing baseline city residential VMT/capita. The VMT limits are based on the SCTA's Sonoma County Travel model. The citywide residential VMT threshold is 19.42 VMT per capita[3]. For residential projects, a project will cause significant additional VMT if it exceeds existing citywide average residential (home-based) VMT per capita, minus 15 percent.

PROJECT SCREENING

Some projects have characteristics that readily lead to the conclusion that they will not cause a significant VMT impact, and therefore those projects may be screened out of completing a detailed VMT analysis. The city screening criteria for land use projects are:

- Small infill projects- 110 or fewer daily vehicle trips. As mentioned earlier, the project is expected to generate 320 daily trips. Therefore, this criterion does not apply to the project.
- Land use project Screening- The project site is located within Neighborhood, Low Density (NL) zoning district. Per the city Municipal Code, the minimum density is four (4) units per acre and the maximum density is six (6) units per acre (Section 17.24.020- Zoning District Subdivision and Density Standards)[10]. Project's proposed density is 4.92 units per acre (35 units/7.12 acres = 4.92 units per acre), which is consistence with the General Plan.

[11] Technical Advisory on Evaluating Transportation Impacts in CEQA, Governor's Office of Planning and Research, State of California (OPR), December 2018.



Source: City of Cotati, September 22, 2020.

Figure 8. City of Cotati Vehicle Miles Traveled Analysis Process.

- Map-based screening for Residential and Office Projects- Low-VMT generating areas as shown on the screening maps that follow (OPR Technical Advisory). The project is located outside of prescreened map-based area, as shown in Figure 9. Therefore, this criterion does not apply to the project.
- Near transit station (i.e., SMART)- within ½ mile of an existing major transit stop or an existing stop along a high-quality transit. The project location is approximately 1.6 miles from the Cotati SMART train station. Therefore, this criterion does not apply to the project.
- Affordable Housing 100% affordable (OPR Technical Advisory)- the project is a market rate housing development that will provide at least fifteen percent (15%) of the total units as inclusionary units restricted for occupancy by moderate-, low- or very low-income households to meet the city Municipal Code's affordable housing requirements (Chapter 17.31- Affordable Housing Requirements)[10]. Therefore, this criterion does not apply to the project.
- Local-Serving Retail- not applicable to the project.
- Mixed-Use Projects- not applicable to the project.
- Local-Serving Public Facilities (excluding schools)- not applicable to the project.

Thus, the project is required to conduct VMT analysis.

PROJECT VMT IMPACT ANALYSIS

VMT is typically calculated and forecasted with a travel demand model, which can estimate the total number and length of vehicle trips for a given geographic area. Using a travel demand model is typically preferred over other methods because the travel model is better able to account for both project generated VMT and the project's effect on total area wide VMT, both of which are important in a CEQA analysis[3]. The Sonoma County Transportation Authority (SCTA) travel demand model was used in this analysis.

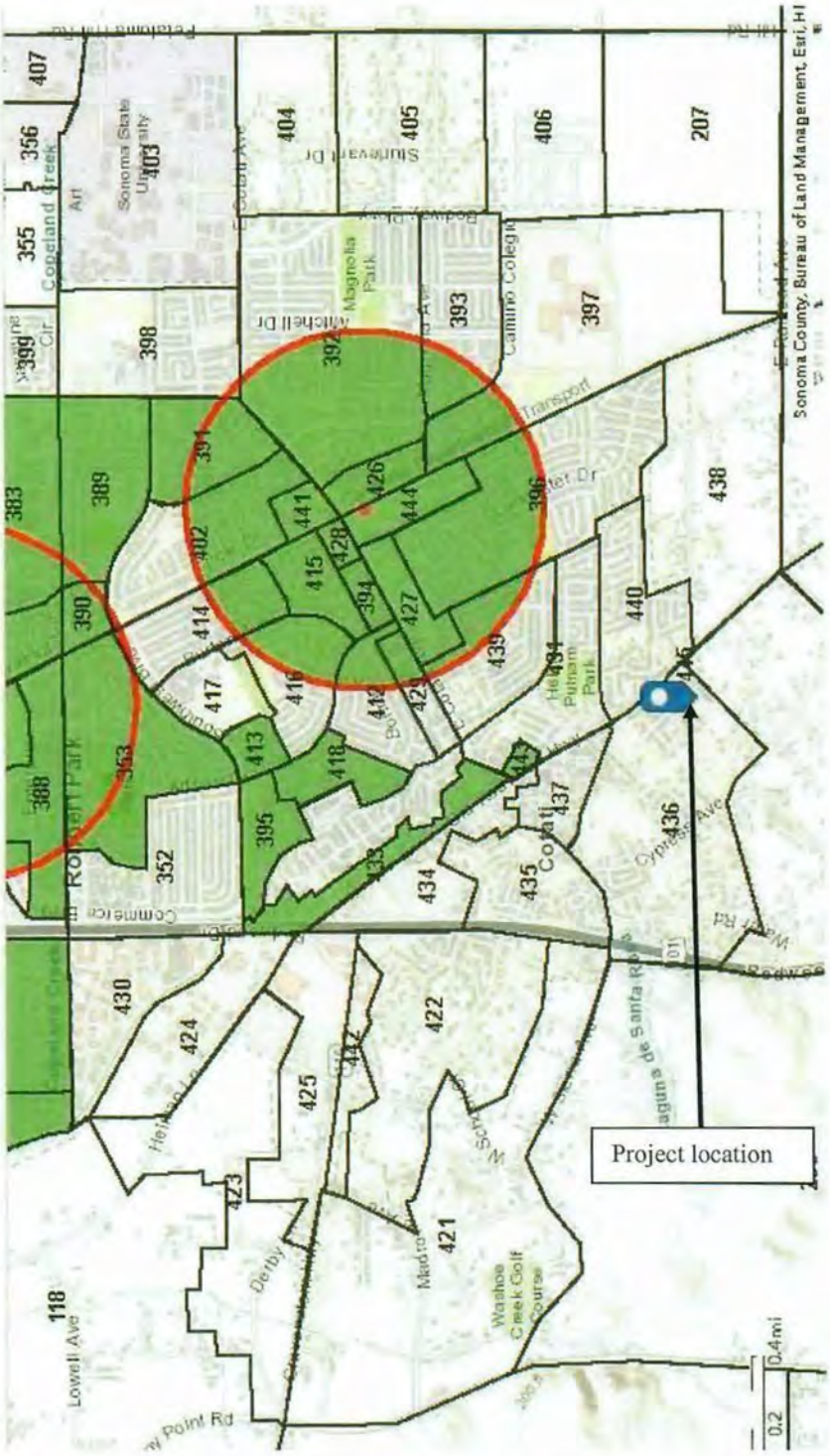
The citywide limit for home-based residential VMT (is based on the SCTA's Sonoma County travel demand model) is 19.42 VMT/per capita[3].

The project is in the model's Traffic Analysis Zone (TAZ) 436, as shown in Figure 9. The model's home-based VMT per capita for TAZ 436 are:

- Base Year 2015: 11.56 VMT per capita.
- Cumulative Year 2040: 6.67 VMT per capita.

The Cotati household size is 2.7 persons per unit[12].

[12] 2020 United States Census, United States Census Bureau, December 30, 2021.



Source: Bureau of Land Management, County of Sonoma, December 29, 2021.

Figure 9. Vehicle Miles Traveled Map-Based Screening.

In the worst-case scenario (assuming VMT per capita in 2021 is the same as in 2015) the project's VMT is:

- Year 2021 (Existing): 35 x 2.7 x 11.56 = 1,092.42 VMT.
- Year 2040 (Cumulative): 35 x 2.7 x 6.67 = 630.32 VMT.

The project's VMT baseline using the citywide VMT per capita threshold (19.42 VMT per capita) is:

- 35 x 2.7 x 19.42 = 1,835.19 VMT.

Comparing project's VMT to the citywide VMT baseline results are:

- Year 2021: project's VMT is expected to be 40.47% below the citywide VMT baseline.
- Year 2040: project's VMT is expected to be 65.65% below the citywide VMT baseline.

The project is expected to have insignificant impact on VMT.

SECTION 5- CONCLUSIONS/RECOMMENDATIONS

- Project is expected to generate 302 daily trips, of which 24 trips (6 inbound and 18 outbound) during am peak hour and 22 trips (14 inbound and 8 outbound) during pm peak hour.

- At unsignalized intersections, LOS shall be determined for both controlled movements and for the overall intersection. Controlled movements operating at LOS E or LOS F are allowable if 1) the intersection is projected to operate at LOS C or better overall, and 2) the projected traffic volume on the controlled movement is 30 vehicles or less per hour on approaches with single lanes, or on multilane approaches, 30 vehicles or less per hour on lanes serving left turns and through movements.

- Study intersections are expected to operate at acceptable LOS during am and pm peak hours under all study scenarios.

- The project is expected to have insignificant impact on intersections traffic delays under existing (0.8 seconds per vehicle delay increase in worst-case scenario) or cumulative (4.8 seconds per vehicle increase in worst-case scenario) scenarios.

- It is recommended to widen and restripe Old Redwood Highway, between project's southern border and Clothier Lane, to provide a center turn lane, which is expected to improve LOS of traffic exiting project's access street.

- Under Existing Scenario, study intersections' turn lane storages are expected to be capable of handling 95th percentile traffic queues during am and pm peak hours, except for westbound left-turn movements during am peak hour and southbound left-turn movements during pm peak hour at the intersection of Old Redwood Highway/Myrtle Avenue/Valparaiso Avenue.

- Under Cumulative Scenario, intersections' turn lane storages are expected to be capable of handling 95th percentile traffic queues during am and pm peak hours, except for westbound left-turn movements during am peak hour and southbound left-turn movements during pm peak hour at the intersection of Old Redwood Highway/Myrtle Avenue/Valparaiso Avenue; and westbound right-turn movements during am peak hour at Old Redwood Highway/Eucalyptus Avenue intersection.

- The excess queues can be accommodated within the main through lanes under existing or cumulative scenarios.

- As the intersection currently operates at an acceptable level of service (LOS B), no mitigations currently are required.

- The project is expected to have insignificant impact on study intersections' traffic queues under existing (6-ft queue length increase in worst-case scenario) or cumulative (3-ft queue length increase in worst-case scenario) scenarios.

- Sonoma County Transit Route 48 (Santa Rosa, Rohnert Park, Cotati, Petaluma) and Route 10 (Cotati, Rohnert Park, Sonoma State University) provide local and regional service to/from the city.

- Three (3) bus stops currently located approximately 0.25 miles north of the project site, east and south of Old Redwood Highway/Myrtle Avenue/Valparaiso intersection.

- Within the city limits, there are existing Class II bicycle lanes on both sides of Old Redwood Highway, including in project vicinity. It is recommended to incorporates these lanes in project frontage improvement design plans.

- It is recommended to construct a pedestrian sidewalk along project frontage to provide safe and continuous pedestrian connections from surrounding neighborhoods.

- Project site access and internal circulation would be provided through a 2-way access street off Old Redwood Highway.

- Sight distance at the proposed access street when looking to the north of south (approximately 850 feet) exceeds Caltrans minimum stopping sight distance requirements (250 feet at a design speed of 35-mph).

- No vegetation or building along the project frontage shall obstruct the visibility of vehicles entering or exiting project access street onto Old Redwood Highway (clear line of sight within minimum sight distance envelope).

- The internal project roadways are typical of a small residential development and consistent with city's Municipal Code (Section 17.26.030- Street and Streetscape Standards.

- Access in and out of project site shall be designed to adequately accommodate emergency response vehicles maneuvers and emergency evacuations. Internal access street aisle and parking spaces shall also be designed to meet city standards.

- It is recommended to install a stop sign at the proposed access street onto Old Redwood Highway. It is also recommended to install a pedestrian crossing pavement marking along the access street.

- The city municipal code's parking requirements for single-family dwellings is two (2) covered spaces within a garage or carport. It is recommended to design the housing units to meet city code parking requirements and design standards.

- Vehicle Miles Traveled (VMT) measures the amount of vehicular travel across the system, rather than at specific points, usually expressed per person. It measures total travel total travel and activity not congestion and captures big picture or regional impacts of travel.

- The city VMT guidelines follow the Governor's Office of Planning and Research (OPR) update to the CEQA Guidelines to implement the requirements of SB 743.

- The city VMT analysis process follows VMT metrics based on information from the Sonoma County Travel Model.

- For residential land uses, the OPR Technical Advisory recommends using residential VMT per capita for home-based trips. Further, the city recommends using city residential VMT per capita (rather than regional VMT per capita) for analysis of residential projects.

- The city uses ORP Technical Advisory VMT threshold recommendations. OPR recommends that VMT thresholds for residential-based land use projects be set at fifteen percent (15%) below the existing baseline city residential VMT/capita.

- The VMT limits are based on the SCTA's Sonoma County Travel model.

- The citywide residential VMT threshold is 19.42 VMT per capita.

- For residential projects, a project will cause significant additional VMT if it exceeds existing citywide average residential (home-based) VMT per capita, minus 15 percent.

- The project does not meet the city VMT guidelines criteria for being screened out of completing a detailed VMT analysis.

- The project is also located outside the city's prescreened map of residential projects with low VMT generating areas that does not require a detailed VMT analysis.

- The project is required to conduct VMT analysis. The Sonoma County Transportation Authority (SCTA) travel demand model was used in this analysis.

- The project is SCTA model's Traffic Analysis Zone (TAZ) 436.

- The SCTA model's home-based VMT per capita for TAZ 436 is 11.56 VMT per capita for base year 2015 and 6.67 VMT per capita for cumulative year 2040.

- The Cotati household size is 2.7 persons per unit.

- In the worst-case scenario, the project's is expected to generate 1,092.42 VMT under Existing Scenario (Year 2021) and 630.32 VMT under Commutative Scenario (Year 2040.

- The project's VMT under Existing Scenario (Year 2021) is expected to be 40.47% below the citywide VMT baseline and under Cumulative Scenario (Year 2040) is expected to be 65.65% below the citywide VMT baseline.

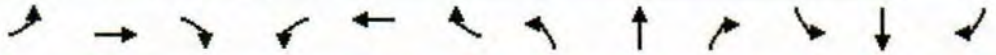
- The project is expected to have insignificant impact on VMT.

APPENDIX A

Intersection Capacity Analysis Worksheets

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	12	160	246	171	60	474	92	32	556	12
v/c Ratio	0.03	0.27	0.65	0.30	0.25	0.52	0.12	0.19	0.71	0.02
Control Delay	15.6	7.8	26.9	13.4	28.7	15.1	4.7	33.0	24.5	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.6	7.8	26.9	13.4	28.7	15.1	4.7	33.0	24.5	11.9
Queue Length 50th (ft)	3	12	74	32	19	88	2	11	174	1
Queue Length 95th (ft)	13	27	120	52	57	175	13	28	291	7
Internal Link Dist (ft)		390		352		498			210	
Turn Bay Length (ft)	60		90		100		100	100		100
Base Capacity (vph)	585	862	602	864	872	1459	1221	168	785	643
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.19	0.41	0.20	0.07	0.32	0.08	0.19	0.71	0.02

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	31	81	175	61	62	53	327	59	20	434	7
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	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.90		1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1634		1770	1707		1770	1863	1539	1770	1863	1529
Flt Permitted	0.64	1.00		0.66	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1189	1634		1221	1707		1770	1863	1539	1770	1863	1529
Peak-hour factor, PHF	0.83	0.65	0.72	0.71	0.64	0.82	0.88	0.69	0.64	0.62	0.78	0.58
Adj. Flow (vph)	12	48	112	246	95	76	60	474	92	32	556	12
RTOR Reduction (vph)	0	79	0	0	34	0	0	0	43	0	0	3
Lane Group Flow (vph)	12	81	0	246	137	0	60	474	49	32	556	9
Confl. Peds. (#/hr)			2			8			3			7
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	17.4	17.4		17.4	17.4		4.5	27.3	27.3	1.6	24.4	24.4
Effective Green, g (s)	17.4	17.4		17.4	17.4		4.5	27.3	27.3	1.6	24.4	24.4
Actuated g/C Ratio	0.30	0.30		0.30	0.30		0.08	0.47	0.47	0.03	0.42	0.42
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	355	488		364	509		137	872	721	49	780	640
v/s Ratio Prot		0.05			0.08		c0.03	c0.25		0.02	c0.30	
v/s Ratio Perm	0.01			c0.20					0.03			0.01
v/c Ratio	0.03	0.17		0.68	0.27		0.44	0.54	0.07	0.65	0.71	0.01
Uniform Delay, d1	14.5	15.1		18.0	15.6		25.7	11.1	8.5	28.1	14.0	9.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.2		4.9	0.3		2.2	0.7	0.0	27.1	3.1	0.0
Delay (s)	14.5	15.3		22.9	15.9		27.9	11.8	8.6	55.2	17.1	9.9
Level of Service	B	B		C	B		C	B	A	E	B	A
Approach Delay (s)		15.2			20.0			12.8			19.0	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM Average Control Delay	16.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	58.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	1	0	430	690	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.75	0.62	0.75	0.70	0.50
Hourly flow rate (vph)	1	1	0	573	986	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					828	
pX, platoon unblocked	0.69	0.69	0.69			
vC, conflicting volume	1559	986	986			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1585	756	756			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	82	282	591			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	3	573	986
Volume Left	1	0	0
Volume Right	1	0	0
cSH	126	591	1700
Volume to Capacity	0.02	0.00	0.58
Queue Length 95th (ft)	2	0	0
Control Delay (s)	34.2	0.0	0.0
Lane LOS	D		
Approach Delay (s)	34.2	0.0	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	46.3%	ICU Level of Service	A
Analysis Period (min)	15		

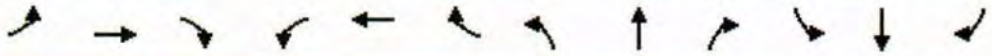
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	29	24	406	8	10	687
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.72	0.75	0.75	0.50	0.62	0.70
Hourly flow rate (vph)	40	32	541	16	16	981
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)						1208
pX, platoon unblocked	0.73					
vC, conflicting volume	1563	549			557	
vC1, stage 1 conf vol	549					
vC2, stage 2 conf vol	1014					
vCu, unblocked vol	1586	549			557	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	94			98	
cM capacity (veh/h)	273	535			1013	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	72	557	16	981
Volume Left	40	0	16	0
Volume Right	32	16	0	0
cSH	349	1700	1013	1700
Volume to Capacity	0.21	0.33	0.02	0.58
Queue Length 95th (ft)	19	0	1	0
Control Delay (s)	18.0	0.0	8.6	0.0
Lane LOS	C		A	
Approach Delay (s)	18.0	0.0	0.1	
Approach LOS	C			

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	16	136	84	96	56	538	156	120	369	28
v/c Ratio	0.06	0.33	0.32	0.24	0.21	0.55	0.18	0.38	0.33	0.03
Control Delay	20.8	15.2	24.4	11.4	28.7	16.8	5.9	29.7	12.1	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.8	15.2	24.4	11.4	28.7	16.8	5.9	29.7	12.1	6.9
Queue Length 50th (ft)	4	20	23	8	16	131	9	33	73	1
Queue Length 95th (ft)	11	52	60	31	59	329	51	110	202	13
Internal Link Dist (ft)		390		352		498			210	
Turn Bay Length (ft)	60		90		100		100	100		100
Base Capacity (vph)	727	979	700	939	993	1310	1111	420	1116	917
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.14	0.12	0.10	0.06	0.41	0.14	0.29	0.33	0.03

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	50	48	66	23	59	48	473	145	104	317	21
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	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.97		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1694		1770	1626		1770	1863	1540	1770	1863	1531
Flt Permitted	0.69	1.00		0.67	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1294	1694		1248	1626		1770	1863	1540	1770	1863	1531
Peak-hour factor, PHF	0.50	0.73	0.71	0.79	0.72	0.92	0.86	0.88	0.93	0.87	0.86	0.75
Adj. Flow (vph)	16	68	68	84	32	64	56	538	156	120	369	28
RTOR Reduction (vph)	0	51	0	0	54	0	0	0	54	0	0	10
Lane Group Flow (vph)	16	85	0	84	42	0	56	538	102	120	369	18
Confl. Peds. (#/hr)			2			8			3			7
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	9.1	9.1		9.1	9.1		4.4	27.9	27.9	7.1	30.6	30.6
Effective Green, g (s)	9.1	9.1		9.1	9.1		4.4	27.9	27.9	7.1	30.6	30.6
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.08	0.50	0.50	0.13	0.55	0.55
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	210	275		202	264		139	927	766	224	1016	835
v/s Ratio Prot		0.05			0.03		0.03	c0.29		c0.07	c0.20	
v/s Ratio Perm	0.01			c0.07					0.07			0.01
v/c Ratio	0.08	0.31		0.42	0.16		0.40	0.58	0.13	0.54	0.36	0.02
Uniform Delay, d1	19.9	20.7		21.1	20.2		24.6	10.0	7.6	23.0	7.2	5.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.6		1.4	0.3		1.9	0.9	0.1	2.5	0.2	0.0
Delay (s)	20.1	21.4		22.5	20.5		26.5	10.9	7.7	25.4	7.4	5.9
Level of Service	C	C		C	C		C	B	A	C	A	A
Approach Delay (s)		21.2			21.4			11.4			11.5	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	13.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	56.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	1	1	634	431	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.67	0.67	0.92	0.97	0.69
Hourly flow rate (vph)	0	1	1	689	444	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)					815	
pX, platoon unblocked	0.99	0.99	0.99			
vC, conflicting volume	1137	445	446			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1134	437	438			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	222	615	1114			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	1	691	446
Volume Left	0	1	0
Volume Right	1	0	1
cSH	615	1114	1700
Volume to Capacity	0.00	0.00	0.26
Queue Length 95th (ft)	0	0	0
Control Delay (s)	10.9	0.0	0.0
Lane LOS	B	A	
Approach Delay (s)	10.9	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	10	16	618	25	25	418
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.67	0.92	0.69	0.69	0.97
Hourly flow rate (vph)	12	24	672	36	36	431
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)						1208
pX, platoon unblocked						
vC, conflicting volume	1193	690			708	
vC1, stage 1 conf vol	690					
vC2, stage 2 conf vol	503					
vCu, unblocked vol	1193	690			708	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	95			96	
cM capacity (veh/h)	411	445			891	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	36	708	24	443
Volume Left	12	0	24	12
Volume Right	24	36	0	0
cSH	433	1700	891	891
Volume to Capacity	0.08	0.42	0.04	0.04
Queue Length 95th (ft)	7	0	3	3
Control Delay (s)	14.1	0.0	9.2	0.7
Lane LOS	B		A	A
Approach Delay (s)	14.1	0.0	1.2	
Approach LOS	B			

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	12	160	249	171	61	484	100	32	559	12
v/c Ratio	0.03	0.27	0.66	0.30	0.25	0.53	0.13	0.19	0.71	0.02
Control Delay	16.2	8.1	27.8	13.7	29.4	15.2	4.7	33.9	24.2	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	8.1	27.8	13.7	29.4	15.2	4.7	33.9	24.2	11.9
Queue Length 50th (ft)	3	12	75	32	20	92	2	11	177	1
Queue Length 95th (ft)	14	28	126	53	59	178	13	28	293	7
Internal Link Dist (ft)		390		352		498			210	
Turn Bay Length (ft)	60		90		100		100	100		100
Base Capacity (vph)	577	852	592	854	862	1444	1210	166	789	646
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.19	0.42	0.20	0.07	0.34	0.08	0.19	0.71	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	31	81	177	61	62	54	334	64	20	436	7
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	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.90		1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1634		1770	1707		1770	1863	1539	1770	1863	1529
Flt Permitted	0.64	1.00		0.65	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1184	1634		1217	1707		1770	1863	1539	1770	1863	1529
Peak-hour factor, PHF	0.83	0.65	0.72	0.71	0.64	0.82	0.88	0.69	0.64	0.62	0.78	0.58
Adj. Flow (vph)	12	48	112	249	95	76	61	484	100	32	559	12
RTOR Reduction (vph)	0	78	0	0	34	0	0	0	45	0	0	3
Lane Group Flow (vph)	12	82	0	249	137	0	61	484	55	32	559	9
Confl. Peds. (#/hr)			2			8			3			7
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	17.8	17.8		17.8	17.8		4.6	28.0	28.0	1.6	25.0	25.0
Effective Green, g (s)	17.8	17.8		17.8	17.8		4.6	28.0	28.0	1.6	25.0	25.0
Actuated g/C Ratio	0.30	0.30		0.30	0.30		0.08	0.47	0.47	0.03	0.42	0.42
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	355	490		365	512		137	878	725	48	784	644
v/s Ratio Prot		0.05			0.08		c0.03	c0.26		0.02	c0.30	
v/s Ratio Perm	0.01			c0.20					0.04			0.01
v/c Ratio	0.03	0.17		0.68	0.27		0.45	0.55	0.08	0.67	0.71	0.01
Uniform Delay, d1	14.7	15.3		18.3	15.8		26.2	11.2	8.6	28.6	14.2	10.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.2		5.2	0.3		2.3	0.8	0.0	29.8	3.1	0.0
Delay (s)	14.8	15.5		23.5	16.1		28.5	12.0	8.6	58.4	17.3	10.0
Level of Service	B	B		C	B		C	B	A	E	B	B
Approach Delay (s)		15.4			20.5			13.0			19.4	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM Average Control Delay	17.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	59.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	13	7	2	430	690	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.75	0.62	0.75	0.70	0.50
Hourly flow rate (vph)	18	9	3	573	986	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					828	
pX, platoon unblocked	0.68	0.68	0.68			
vC, conflicting volume	1569	990	994			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1602	754	760			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	77	97	99			
cM capacity (veh/h)	79	280	583			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	27	577	994
Volume Left	18	3	0
Volume Right	9	0	8
cSH	105	583	1700
Volume to Capacity	0.26	0.01	0.58
Queue Length 95th (ft)	24	0	0
Control Delay (s)	51.1	0.2	0.0
Lane LOS	F	A	
Approach Delay (s)	51.1	0.2	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		

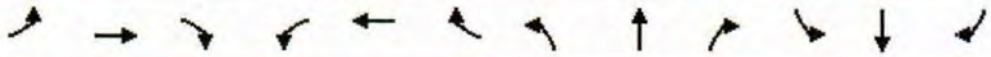
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	29	24	408	8	11	693
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.72	0.75	0.75	0.50	0.62	0.70
Hourly flow rate (vph)	40	32	544	16	18	990
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)						1208
pX, platoon unblocked	0.73					
vC, conflicting volume	1577	552			560	
vC1, stage 1 conf vol	552					
vC2, stage 2 conf vol	1025					
vCu, unblocked vol	1606	552			560	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	94			98	
cM capacity (veh/h)	268	533			1011	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	72	560	18	990
Volume Left	40	0	18	0
Volume Right	32	16	0	0
cSH	344	1700	1011	1700
Volume to Capacity	0.21	0.33	0.02	0.58
Queue Length 95th (ft)	19	0	1	0
Control Delay (s)	18.2	0.0	8.6	0.0
Lane LOS	C		A	
Approach Delay (s)	18.2	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	12	160	249	171	61	484	100	32	559	12
v/c Ratio	0.03	0.27	0.66	0.30	0.25	0.53	0.13	0.19	0.71	0.02
Control Delay	16.2	8.1	27.8	13.7	29.4	15.2	4.7	33.9	24.2	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	8.1	27.8	13.7	29.4	15.2	4.7	33.9	24.2	11.9
Queue Length 50th (ft)	3	12	75	32	20	92	2	11	177	1
Queue Length 95th (ft)	14	28	126	53	59	178	13	28	293	7
Internal Link Dist (ft)		390		352		498			210	
Turn Bay Length (ft)	60		90		100		100	100		100
Base Capacity (vph)	577	852	592	854	862	1444	1210	166	789	646
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.19	0.42	0.20	0.07	0.34	0.08	0.19	0.71	0.02

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	31	81	177	61	62	54	334	64	20	436	7
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	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.90		1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1634		1770	1707		1770	1863	1539	1770	1863	1529
Flt Permitted	0.64	1.00		0.65	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1184	1634		1217	1707		1770	1863	1539	1770	1863	1529
Peak-hour factor, PHF	0.83	0.65	0.72	0.71	0.64	0.82	0.88	0.69	0.64	0.62	0.78	0.58
Adj. Flow (vph)	12	48	112	249	95	76	61	484	100	32	559	12
RTOR Reduction (vph)	0	78	0	0	34	0	0	0	45	0	0	3
Lane Group Flow (vph)	12	82	0	249	137	0	61	484	55	32	559	9
Confl. Peds. (#/hr)			2			8			3			7
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	17.8	17.8		17.8	17.8		4.6	28.0	28.0	1.6	25.0	25.0
Effective Green, g (s)	17.8	17.8		17.8	17.8		4.6	28.0	28.0	1.6	25.0	25.0
Actuated g/C Ratio	0.30	0.30		0.30	0.30		0.08	0.47	0.47	0.03	0.42	0.42
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	355	490		365	512		137	878	725	48	784	644
v/s Ratio Prot		0.05			0.08		c0.03	c0.26		0.02	c0.30	
v/s Ratio Perm	0.01			c0.20					0.04			0.01
v/c Ratio	0.03	0.17		0.68	0.27		0.45	0.55	0.08	0.67	0.71	0.01
Uniform Delay, d1	14.7	15.3		18.3	15.8		26.2	11.2	8.6	28.6	14.2	10.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.2		5.2	0.3		2.3	0.8	0.0	29.8	3.1	0.0
Delay (s)	14.8	15.5		23.5	16.1		28.5	12.0	8.6	58.4	17.3	10.0
Level of Service	B	B		C	B		C	B	A	E	B	B
Approach Delay (s)		15.4			20.5			13.0			19.4	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM Average Control Delay	17.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	59.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	13	7	2	430	690	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.75	0.62	0.75	0.70	0.50
Hourly flow rate (vph)	18	9	3	573	986	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					828	
pX, platoon unblocked	0.66	0.66	0.66			
vC, conflicting volume	1569	990	994			
vC1, stage 1 conf vol	990					
vC2, stage 2 conf vol	580					
vCu, unblocked vol	1605	726	732			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	97	99			
cM capacity (veh/h)	275	280	575			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	27	577	994
Volume Left	18	3	0
Volume Right	9	0	8
cSH	277	575	1700
Volume to Capacity	0.10	0.01	0.58
Queue Length 95th (ft)	8	0	0
Control Delay (s)	19.4	0.2	0.0
Lane LOS	C	A	
Approach Delay (s)	19.4	0.2	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		

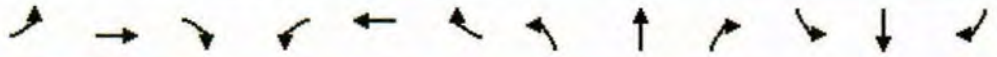
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	29	24	408	8	11	693
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.72	0.75	0.75	0.50	0.62	0.70
Hourly flow rate (vph)	40	32	544	16	18	990
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)						1208
pX, platoon unblocked	0.73					
vC, conflicting volume	1577	552			560	
vC1, stage 1 conf vol	552					
vC2, stage 2 conf vol	1025					
vCu, unblocked vol	1606	552			560	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	94			98	
cM capacity (veh/h)	268	533			1011	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	72	560	18	990
Volume Left	40	0	18	0
Volume Right	32	16	0	0
cSH	344	1700	1011	1700
Volume to Capacity	0.21	0.33	0.02	0.58
Queue Length 95th (ft)	19	0	1	0
Control Delay (s)	18.2	0.0	8.6	0.0
Lane LOS	C		A	
Approach Delay (s)	18.2	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	16	137	86	96	57	541	157	120	374	28
v/c Ratio	0.06	0.33	0.32	0.24	0.21	0.55	0.18	0.38	0.34	0.03
Control Delay	20.9	15.2	24.5	11.4	28.8	16.9	5.9	29.8	12.2	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	15.2	24.5	11.4	28.8	16.9	5.9	29.8	12.2	7.0
Queue Length 50th (ft)	4	20	24	8	16	132	9	34	74	1
Queue Length 95th (ft)	11	51	61	31	60	331	52	110	205	13
Internal Link Dist (ft)		390		352		498			210	
Turn Bay Length (ft)	60		90		100		100	100		100
Base Capacity (vph)	723	975	696	935	988	1305	1108	418	1116	917
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.14	0.12	0.10	0.06	0.41	0.14	0.29	0.34	0.03

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	50	49	68	23	59	49	476	146	104	322	21
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	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.97		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1693		1770	1626		1770	1863	1540	1770	1863	1531
Flt Permitted	0.69	1.00		0.67	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1294	1693		1247	1626		1770	1863	1540	1770	1863	1531
Peak-hour factor, PHF	0.50	0.73	0.71	0.79	0.72	0.92	0.86	0.88	0.93	0.87	0.86	0.75
Adj. Flow (vph)	16	68	69	86	32	64	57	541	157	120	374	28
RTOR Reduction (vph)	0	52	0	0	54	0	0	0	54	0	0	10
Lane Group Flow (vph)	16	85	0	86	42	0	57	541	103	120	374	18
Confl. Peds. (#/hr)			2			8			3			7
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	9.2	9.2		9.2	9.2		4.4	28.0	28.0	7.1	30.7	30.7
Effective Green, g (s)	9.2	9.2		9.2	9.2		4.4	28.0	28.0	7.1	30.7	30.7
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.08	0.50	0.50	0.13	0.55	0.55
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	211	277		204	266		138	927	766	223	1016	835
v/s Ratio Prot		0.05			0.03		0.03	c0.29		c0.07	c0.20	
v/s Ratio Perm	0.01			c0.07					0.07			0.01
v/c Ratio	0.08	0.31		0.42	0.16		0.41	0.58	0.13	0.54	0.37	0.02
Uniform Delay, d1	19.9	20.7		21.2	20.2		24.7	10.0	7.6	23.1	7.3	5.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.6		1.4	0.3		2.0	0.9	0.1	2.5	0.2	0.0
Delay (s)	20.1	21.4		22.6	20.5		26.7	11.0	7.7	25.6	7.5	5.9
Level of Service	C	C		C	C		C	B	A	C	A	A
Approach Delay (s)		21.2			21.5			11.5			11.6	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	13.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	56.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	4	8	634	431	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.67	0.67	0.92	0.97	0.69
Hourly flow rate (vph)	6	6	12	689	444	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					815	
pX, platoon unblocked	0.99	0.99	0.99			
vC, conflicting volume	1163	450	456			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1158	434	440			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	99	99			
cM capacity (veh/h)	211	612	1103			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	12	701	456
Volume Left	6	12	0
Volume Right	6	0	12
cSH	313	1103	1700
Volume to Capacity	0.04	0.01	0.27
Queue Length 95th (ft)	3	1	0
Control Delay (s)	16.9	0.3	0.0
Lane LOS	C	A	
Approach Delay (s)	16.9	0.3	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	10	16	626	25	25	422
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.67	0.92	0.69	0.69	0.97
Hourly flow rate (vph)	12	24	680	36	36	435
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)						1208
pX, platoon unblocked						
vC, conflicting volume	1206	699			717	
vC1, stage 1 conf vol	699					
vC2, stage 2 conf vol	508					
vCu, unblocked vol	1206	699			717	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	95			96	
cM capacity (veh/h)	408	440			884	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	36	717	24	447
Volume Left	12	0	24	12
Volume Right	24	36	0	0
cSH	429	1700	884	884
Volume to Capacity	0.08	0.42	0.04	0.04
Queue Length 95th (ft)	7	0	3	3
Control Delay (s)	14.2	0.0	9.2	0.7
Lane LOS	B		A	A
Approach Delay (s)	14.2	0.0	1.2	
Approach LOS	B			

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	16	137	86	96	57	541	157	120	374	28
v/c Ratio	0.06	0.33	0.32	0.24	0.21	0.55	0.18	0.38	0.34	0.03
Control Delay	20.9	15.2	24.5	11.4	28.8	16.9	5.9	29.8	12.2	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	15.2	24.5	11.4	28.8	16.9	5.9	29.8	12.2	7.0
Queue Length 50th (ft)	4	20	24	8	16	132	9	34	74	1
Queue Length 95th (ft)	11	51	61	31	60	331	52	110	205	13
Internal Link Dist (ft)		390		352		498			210	
Turn Bay Length (ft)	60		90		100		100	100		100
Base Capacity (vph)	723	975	696	935	988	1305	1108	418	1116	917
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.14	0.12	0.10	0.06	0.41	0.14	0.29	0.34	0.03

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	50	49	68	23	59	49	476	146	104	322	21
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	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.97		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1693		1770	1626		1770	1863	1540	1770	1863	1531
Flt Permitted	0.69	1.00		0.67	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1294	1693		1247	1626		1770	1863	1540	1770	1863	1531
Peak-hour factor, PHF	0.50	0.73	0.71	0.79	0.72	0.92	0.86	0.88	0.93	0.87	0.86	0.75
Adj. Flow (vph)	16	68	69	86	32	64	57	541	157	120	374	28
RTOR Reduction (vph)	0	52	0	0	54	0	0	0	54	0	0	10
Lane Group Flow (vph)	16	85	0	86	42	0	57	541	103	120	374	18
Confl. Peds. (#/hr)			2			8			3			7
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	9.2	9.2		9.2	9.2		4.4	28.0	28.0	7.1	30.7	30.7
Effective Green, g (s)	9.2	9.2		9.2	9.2		4.4	28.0	28.0	7.1	30.7	30.7
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.08	0.50	0.50	0.13	0.55	0.55
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	211	277		204	266		138	927	766	223	1016	835
v/s Ratio Prot		0.05			0.03		0.03	c0.29		c0.07	c0.20	
v/s Ratio Perm	0.01			c0.07					0.07			0.01
v/c Ratio	0.08	0.31		0.42	0.16		0.41	0.58	0.13	0.54	0.37	0.02
Uniform Delay, d1	19.9	20.7		21.2	20.2		24.7	10.0	7.6	23.1	7.3	5.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.6		1.4	0.3		2.0	0.9	0.1	2.5	0.2	0.0
Delay (s)	20.1	21.4		22.6	20.5		26.7	11.0	7.7	25.6	7.5	5.9
Level of Service	C	C		C	C		C	B	A	C	A	A
Approach Delay (s)		21.2			21.5			11.5			11.6	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	13.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	56.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	4	8	634	431	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.67	0.67	0.92	0.97	0.69
Hourly flow rate (vph)	6	6	12	689	444	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					815	
pX, platoon unblocked	0.95	0.95	0.95			
vC, conflicting volume	1163	450	456			
vC1, stage 1 conf vol	450					
vC2, stage 2 conf vol	713					
vCu, unblocked vol	1147	399	406			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	99			
cM capacity (veh/h)	418	620	1100			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	12	701	456
Volume Left	6	12	0
Volume Right	6	0	12
cSH	499	1100	1700
Volume to Capacity	0.02	0.01	0.27
Queue Length 95th (ft)	2	1	0
Control Delay (s)	12.4	0.3	0.0
Lane LOS	B	A	
Approach Delay (s)	12.4	0.3	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	10	16	626	25	25	422
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.67	0.92	0.69	0.69	0.97
Hourly flow rate (vph)	12	24	680	36	36	435
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)						1208
pX, platoon unblocked						
vC, conflicting volume	1206	699			717	
vC1, stage 1 conf vol	699					
vC2, stage 2 conf vol	508					
vCu, unblocked vol	1206	699			717	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	95			96	
cM capacity (veh/h)	408	440			884	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	36	717	24	447
Volume Left	12	0	24	12
Volume Right	24	36	0	0
cSH	429	1700	884	884
Volume to Capacity	0.08	0.42	0.04	0.04
Queue Length 95th (ft)	7	0	3	3
Control Delay (s)	14.2	0.0	9.2	0.7
Lane LOS	B		A	A
Approach Delay (s)	14.2	0.0	1.2	
Approach LOS	B			

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	14	192	296	205	65	510	98	44	740	16
v/c Ratio	0.04	0.30	0.82	0.34	0.40	0.54	0.12	0.36	0.86	0.02
Control Delay	23.4	13.1	49.8	22.1	49.0	19.8	6.2	52.8	36.8	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	13.1	49.8	22.1	49.0	19.8	6.2	52.8	36.8	13.1
Queue Length 50th (ft)	6	38	169	77	39	224	10	27	409	4
Queue Length 95th (ft)	19	51	208	91	79	221	19	43	484	10
Internal Link Dist (ft)		390		352		498			210	
Turn Bay Length (ft)	60		90		100		100	100		100
Base Capacity (vph)	352	631	363	608	481	1227	1033	130	857	699
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.30	0.82	0.34	0.14	0.42	0.09	0.34	0.86	0.02

Intersection Summary

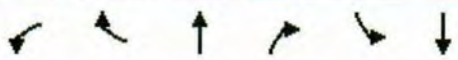
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	37	97	210	73	75	57	352	63	27	577	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00	0.97	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	1.00	1.00
Frt	1.00	0.89		1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1632		1770	1701		1770	1863	1535	1770	1863	1519
Flt Permitted	0.55	1.00		0.57	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1020	1632		1053	1701		1770	1863	1535	1770	1863	1519
Peak-hour factor, PHF	0.83	0.65	0.72	0.71	0.64	0.82	0.88	0.69	0.64	0.62	0.78	0.58
Adj. Flow (vph)	14	57	135	296	114	91	65	510	98	44	740	16
RTOR Reduction (vph)	0	69	0	0	23	0	0	0	34	0	0	3
Lane Group Flow (vph)	14	123	0	296	182	0	65	510	64	44	740	13
Confl. Peds. (#/hr)			2			8			3			7
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	33.1	33.1		33.1	33.1		7.6	48.5	48.5	4.1	45.0	45.0
Effective Green, g (s)	33.1	33.1		33.1	33.1		7.6	48.5	48.5	4.1	45.0	45.0
Actuated g/C Ratio	0.34	0.34		0.34	0.34		0.08	0.50	0.50	0.04	0.46	0.46
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	346	553		357	576		138	925	762	74	858	700
v/s Ratio Prot		0.08			0.11		c0.04	c0.27		0.02	c0.40	
v/s Ratio Perm	0.01			c0.28					0.04			0.01
v/c Ratio	0.04	0.22		0.83	0.32		0.47	0.55	0.08	0.59	0.86	0.02
Uniform Delay, d1	21.7	23.1		29.7	23.9		43.1	17.1	12.9	46.0	23.6	14.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.2		14.6	0.3		2.5	0.7	0.0	12.2	8.9	0.0
Delay (s)	21.7	23.3		44.3	24.2		45.7	17.8	13.0	58.2	32.5	14.3
Level of Service	C	C		D	C		D	B	B	E	C	B
Approach Delay (s)		23.2			36.1			19.8			33.6	
Approach LOS		C			D			B			C	

Intersection Summary			
HCM Average Control Delay	28.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	97.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	1	0	517	830	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.75	0.62	0.75	0.70	0.50
Hourly flow rate (vph)	1	1	0	689	1186	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					828	
pX, platoon unblocked	0.48	0.48	0.48			
vC, conflicting volume	1875	1186	1186			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2274	851	851			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	99	100			
cM capacity (veh/h)	21	174	381			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	3	689	1186
Volume Left	1	0	0
Volume Right	1	0	0
cSH	38	381	1700
Volume to Capacity	0.07	0.00	0.70
Queue Length 95th (ft)	6	0	0
Control Delay (s)	108.4	0.0	0.0
Lane LOS	F		
Approach Delay (s)	108.4	0.0	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	35	29	488	10	12	826
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.72	0.75	0.75	0.50	0.62	0.70
Hourly flow rate (vph)	49	39	651	20	19	1180
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)						1208
pX, platoon unblocked	0.49					
vC, conflicting volume	1879	661			671	
vC1, stage 1 conf vol	661					
vC2, stage 2 conf vol	1219					
vCu, unblocked vol	2268	661			671	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	71	92			98	
cM capacity (veh/h)	169	463			920	

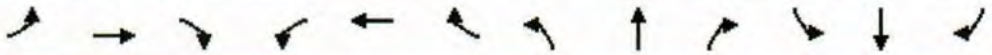
Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	87	671	19	1180
Volume Left	49	0	19	0
Volume Right	39	20	0	0
cSH	235	1700	920	1700
Volume to Capacity	0.37	0.39	0.02	0.69
Queue Length 95th (ft)	41	0	2	0
Control Delay (s)	29.1	0.0	9.0	0.0
Lane LOS	D		A	
Approach Delay (s)	29.1	0.0	0.1	
Approach LOS	D			

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	20	170	104	120	60	578	168	159	490	37
v/c Ratio	0.08	0.42	0.45	0.30	0.25	0.77	0.25	0.52	0.49	0.05
Control Delay	21.7	18.2	29.0	11.7	31.1	24.3	6.8	35.2	14.6	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	18.2	29.0	11.7	31.1	24.3	6.8	35.2	14.6	7.8
Queue Length 50th (ft)	6	33	33	12	19	164	12	50	115	3
Queue Length 95th (ft)	13	67	73	36	62	363	57	#159	283	18
Internal Link Dist (ft)		390		352		498			210	
Turn Bay Length (ft)	60		90		100		100	100		100
Base Capacity (vph)	594	829	520	804	830	1210	1034	351	990	816
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.21	0.20	0.15	0.07	0.48	0.16	0.45	0.49	0.05

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												
Volume (vph)	10	62	60	82	29	74	52	509	156	138	421	28
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	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.97		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1696		1770	1628		1770	1863	1538	1770	1863	1530
Flt Permitted	0.68	1.00		0.60	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1266	1696		1109	1628		1770	1863	1538	1770	1863	1530
Peak-hour factor, PHF	0.50	0.73	0.71	0.79	0.72	0.92	0.86	0.88	0.93	0.87	0.86	0.75
Adj. Flow (vph)	20	85	85	104	40	80	60	578	168	159	490	37
RTOR Reduction (vph)	0	48	0	0	64	0	0	0	61	0	0	10
Lane Group Flow (vph)	20	122	0	104	56	0	60	578	107	159	490	27
Confl. Peds. (#/hr)			2			8			3			7
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	12.5	12.5		12.5	12.5		4.7	26.2	26.2	10.2	31.7	31.7
Effective Green, g (s)	12.5	12.5		12.5	12.5		4.7	26.2	26.2	10.2	31.7	31.7
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.08	0.43	0.43	0.17	0.52	0.52
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	260	348		228	334		137	801	662	296	970	796
v/s Ratio Prot		0.07			0.03		0.03	c0.31		c0.09	0.26	
v/s Ratio Perm	0.02			c0.09					0.07			0.02
v/c Ratio	0.08	0.35		0.46	0.17		0.44	0.72	0.16	0.54	0.51	0.03
Uniform Delay, d1	19.5	20.7		21.2	19.9		26.8	14.3	10.6	23.2	9.5	7.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.6		1.4	0.2		2.2	3.2	0.1	1.9	0.4	0.0
Delay (s)	19.7	21.3		22.7	20.2		29.1	17.6	10.7	25.1	9.9	7.1
Level of Service	B	C		C	C		C	B	B	C	A	A
Approach Delay (s)		21.2			21.3			17.0			13.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	60.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	1	1	791	538	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.67	0.67	0.92	0.97	0.69
Hourly flow rate (vph)	0	1	1	860	555	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)					815	
pX, platoon unblocked	0.90	0.90	0.90			
vC, conflicting volume	1418	555	556			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1409	452	453			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	137	548	999			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	1	861	556
Volume Left	0	1	0
Volume Right	1	0	1
cSH	548	999	1700
Volume to Capacity	0.00	0.00	0.33
Queue Length 95th (ft)	0	0	0
Control Delay (s)	11.6	0.0	0.0
Lane LOS	B	A	
Approach Delay (s)	11.6	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		

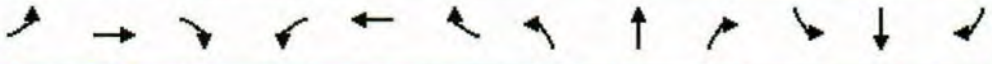
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	12	20	771	31	31	522
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.67	0.92	0.69	0.69	0.97
Hourly flow rate (vph)	14	30	838	45	45	538
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)						1208
pX, platoon unblocked	0.96					
vC, conflicting volume	1489	861			883	
vC1, stage 1 conf vol	861					
vC2, stage 2 conf vol	628					
vCu, unblocked vol	1488	861			883	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	92			94	
cM capacity (veh/h)	333	355			766	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	44	883	30	553
Volume Left	14	0	30	15
Volume Right	30	45	0	0
cSH	348	1700	766	766
Volume to Capacity	0.13	0.52	0.06	0.06
Queue Length 95th (ft)	11	0	5	5
Control Delay (s)	16.9	0.0	10.0	1.1
Lane LOS	C		A	A
Approach Delay (s)	16.9	0.0	1.6	
Approach LOS	C			

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	14	192	299	205	66	520	106	44	742	16
v/c Ratio	0.04	0.30	0.82	0.34	0.40	0.55	0.13	0.36	0.87	0.02
Control Delay	23.4	13.1	50.8	22.1	49.1	20.0	6.3	52.9	37.1	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	13.1	50.8	22.1	49.1	20.0	6.3	52.9	37.1	13.1
Queue Length 50th (ft)	6	38	171	78	40	231	11	27	412	4
Queue Length 95th (ft)	19	51	211	91	80	226	20	43	486	10
Internal Link Dist (ft)		390		352		498			210	
Turn Bay Length (ft)	60		90		100		100	100		100
Base Capacity (vph)	351	630	363	608	481	1227	1034	129	856	698
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.30	0.82	0.34	0.14	0.42	0.10	0.34	0.87	0.02

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	37	97	212	73	75	58	359	68	27	579	9
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	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00	0.97	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	1.00	1.00
Frt	1.00	0.89		1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1632		1770	1701		1770	1863	1535	1770	1863	1519
Flt Permitted	0.55	1.00		0.57	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1019	1632		1053	1701		1770	1863	1535	1770	1863	1519
Peak-hour factor, PHF	0.83	0.65	0.72	0.71	0.64	0.82	0.88	0.69	0.64	0.62	0.78	0.58
Adj. Flow (vph)	14	57	135	299	114	91	66	520	106	44	742	16
RTOR Reduction (vph)	0	69	0	0	23	0	0	0	36	0	0	3
Lane Group Flow (vph)	14	123	0	299	182	0	66	520	70	44	742	13
Confl. Peds. (#/hr)			2			8			3			7
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	33.1	33.1		33.1	33.1		7.6	48.6	48.6	4.1	45.1	45.1
Effective Green, g (s)	33.1	33.1		33.1	33.1		7.6	48.6	48.6	4.1	45.1	45.1
Actuated g/C Ratio	0.34	0.34		0.34	0.34		0.08	0.50	0.50	0.04	0.46	0.46
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	345	552		356	576		138	926	763	74	859	700
v/s Ratio Prot		0.08			0.11		c0.04	c0.28		0.02	c0.40	
v/s Ratio Perm	0.01			c0.28					0.05			0.01
v/c Ratio	0.04	0.22		0.84	0.32		0.48	0.56	0.09	0.59	0.86	0.02
Uniform Delay, d1	21.7	23.1		29.9	24.0		43.2	17.2	13.0	46.0	23.6	14.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.2		15.8	0.3		2.6	0.8	0.1	12.2	9.0	0.0
Delay (s)	21.7	23.4		45.7	24.3		45.8	17.9	13.0	58.2	32.6	14.3
Level of Service	C	C		D	C		D	B	B	E	C	B
Approach Delay (s)		23.2			37.0			19.9			33.6	
Approach LOS		C			D			B			C	

Intersection Summary			
HCM Average Control Delay	29.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	97.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	13	7	2	517	830	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.75	0.62	0.75	0.70	0.50
Hourly flow rate (vph)	18	9	3	689	1186	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					828	
pX, platoon unblocked	0.48	0.48	0.48			
vC, conflicting volume	1885	1190	1194			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2302	854	863			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	11	95	99			
cM capacity (veh/h)	20	172	375			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	27	693	1194
Volume Left	18	3	0
Volume Right	9	0	8
cSH	29	375	1700
Volume to Capacity	0.95	0.01	0.70
Queue Length 95th (ft)	78	1	0
Control Delay (s)	348.6	0.3	0.0
Lane LOS	F	A	
Approach Delay (s)	348.6	0.3	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	35	29	490	10	13	832
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.72	0.75	0.75	0.50	0.62	0.70
Hourly flow rate (vph)	49	39	653	20	21	1189
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)						1208
pX, platoon unblocked	0.49					
vC, conflicting volume	1894	663			673	
vC1, stage 1 conf vol	663					
vC2, stage 2 conf vol	1231					
vCu, unblocked vol	2296	663			673	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	70	92			98	
cM capacity (veh/h)	165	461			918	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	87	673	21	1189
Volume Left	49	0	21	0
Volume Right	39	20	0	0
cSH	230	1700	918	1700
Volume to Capacity	0.38	0.40	0.02	0.70
Queue Length 95th (ft)	42	0	2	0
Control Delay (s)	29.9	0.0	9.0	0.0
Lane LOS	D		A	
Approach Delay (s)	29.9	0.0	0.2	
Approach LOS	D			

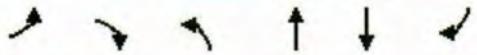
Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	14	192	299	205	66	520	106	44	742	16
v/c Ratio	0.04	0.30	0.82	0.34	0.40	0.55	0.13	0.36	0.87	0.02
Control Delay	23.4	13.1	50.8	22.1	49.1	20.0	6.3	52.9	37.1	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	13.1	50.8	22.1	49.1	20.0	6.3	52.9	37.1	13.1
Queue Length 50th (ft)	6	38	171	78	40	231	11	27	412	4
Queue Length 95th (ft)	19	51	211	91	80	226	20	43	486	10
Internal Link Dist (ft)		390		352		498			210	
Turn Bay Length (ft)	60		90		100		100	100		100
Base Capacity (vph)	351	630	363	608	481	1227	1034	129	856	698
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.30	0.82	0.34	0.14	0.42	0.10	0.34	0.87	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	37	97	212	73	75	58	359	68	27	579	9
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	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00	0.97	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	1.00	1.00
Frt	1.00	0.89		1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1632		1770	1701		1770	1863	1535	1770	1863	1519
Flt Permitted	0.55	1.00		0.57	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1019	1632		1053	1701		1770	1863	1535	1770	1863	1519
Peak-hour factor, PHF	0.83	0.65	0.72	0.71	0.64	0.82	0.88	0.69	0.64	0.62	0.78	0.58
Adj. Flow (vph)	14	57	135	299	114	91	66	520	106	44	742	16
RTOR Reduction (vph)	0	69	0	0	23	0	0	0	36	0	0	3
Lane Group Flow (vph)	14	123	0	299	182	0	66	520	70	44	742	13
Confl. Peds. (#/hr)			2			8			3			7
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	33.1	33.1		33.1	33.1		7.6	48.6	48.6	4.1	45.1	45.1
Effective Green, g (s)	33.1	33.1		33.1	33.1		7.6	48.6	48.6	4.1	45.1	45.1
Actuated g/C Ratio	0.34	0.34		0.34	0.34		0.08	0.50	0.50	0.04	0.46	0.46
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	345	552		356	576		138	926	763	74	859	700
v/s Ratio Prot		0.08			0.11		c0.04	c0.28		0.02	c0.40	
v/s Ratio Perm	0.01			c0.28					0.05			0.01
v/c Ratio	0.04	0.22		0.84	0.32		0.48	0.56	0.09	0.59	0.86	0.02
Uniform Delay, d1	21.7	23.1		29.9	24.0		43.2	17.2	13.0	46.0	23.6	14.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.2		15.8	0.3		2.6	0.8	0.1	12.2	9.0	0.0
Delay (s)	21.7	23.4		45.7	24.3		45.8	17.9	13.0	58.2	32.6	14.3
Level of Service	C	C		D	C		D	B	B	E	C	B
Approach Delay (s)		23.2			37.0			19.9			33.6	
Approach LOS		C			D			B			C	

Intersection Summary			
HCM Average Control Delay	29.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	97.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	13	7	2	517	830	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.75	0.62	0.75	0.70	0.50
Hourly flow rate (vph)	18	9	3	689	1186	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					828	
pX, platoon unblocked	0.48	0.48	0.48			
vC, conflicting volume	1885	1190	1194			
vC1, stage 1 conf vol	1190					
vC2, stage 2 conf vol	696					
vCu, unblocked vol	2299	857	865			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	95	99			
cM capacity (veh/h)	179	172	375			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	27	693	1194
Volume Left	18	3	0
Volume Right	9	0	8
cSH	177	375	1700
Volume to Capacity	0.16	0.01	0.70
Queue Length 95th (ft)	13	1	0
Control Delay (s)	29.1	0.3	0.0
Lane LOS	D	A	
Approach Delay (s)	29.1	0.3	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	35	29	490	10	13	832
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.72	0.75	0.75	0.50	0.62	0.70
Hourly flow rate (vph)	49	39	653	20	21	1189
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)						1208
pX, platoon unblocked	0.49					
vC, conflicting volume	1894	663			673	
vC1, stage 1 conf vol	663					
vC2, stage 2 conf vol	1231					
vCu, unblocked vol	2296	663			673	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	70	92			98	
cM capacity (veh/h)	165	461			918	

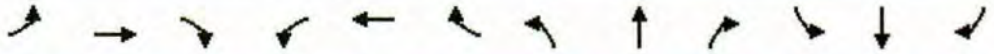
Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	87	673	21	1189
Volume Left	49	0	21	0
Volume Right	39	20	0	0
cSH	230	1700	918	1700
Volume to Capacity	0.38	0.40	0.02	0.70
Queue Length 95th (ft)	42	0	2	0
Control Delay (s)	29.9	0.0	9.0	0.0
Lane LOS	D		A	
Approach Delay (s)	29.9	0.0	0.2	
Approach LOS	D			

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	20	171	106	120	62	582	169	159	495	37
v/c Ratio	0.07	0.42	0.46	0.30	0.26	0.77	0.25	0.53	0.50	0.05
Control Delay	21.7	18.2	29.4	11.7	31.2	24.5	6.8	35.4	14.8	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	18.2	29.4	11.7	31.2	24.5	6.8	35.4	14.8	7.9
Queue Length 50th (ft)	6	34	34	12	20	167	13	51	117	3
Queue Length 95th (ft)	13	67	75	36	64	366	57	#159	288	18
Internal Link Dist (ft)		390		352		498			210	
Turn Bay Length (ft)	60		90		100		100	100		100
Base Capacity (vph)	591	825	514	800	826	1203	1029	349	991	817
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.21	0.21	0.15	0.08	0.48	0.16	0.46	0.50	0.05

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												
Volume (vph)	10	62	61	84	29	74	53	512	157	138	426	28
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	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.97		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1695		1770	1627		1770	1863	1538	1770	1863	1529
Flt Permitted	0.68	1.00		0.59	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1266	1695		1102	1627		1770	1863	1538	1770	1863	1529
Peak-hour factor, PHF	0.50	0.73	0.71	0.79	0.72	0.92	0.86	0.88	0.93	0.87	0.86	0.75
Adj. Flow (vph)	20	85	86	106	40	80	62	582	169	159	495	37
RTOR Reduction (vph)	0	49	0	0	64	0	0	0	61	0	0	10
Lane Group Flow (vph)	20	122	0	106	56	0	62	582	108	159	495	27
Confl. Peds. (#/hr)			2			8			3			7
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	12.6	12.6		12.6	12.6		4.8	26.5	26.5	10.2	31.9	31.9
Effective Green, g (s)	12.6	12.6		12.6	12.6		4.8	26.5	26.5	10.2	31.9	31.9
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.08	0.43	0.43	0.17	0.52	0.52
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	260	348		227	334		139	805	665	295	969	796
v/s Ratio Prot		0.07			0.03		0.04	c0.31		c0.09	0.27	
v/s Ratio Perm	0.02			c0.10					0.07			0.02
v/c Ratio	0.08	0.35		0.47	0.17		0.45	0.72	0.16	0.54	0.51	0.03
Uniform Delay, d1	19.7	20.8		21.4	20.0		27.0	14.4	10.6	23.4	9.6	7.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.6		1.5	0.2		2.3	3.2	0.1	1.9	0.5	0.0
Delay (s)	19.8	21.5		22.9	20.3		29.3	17.6	10.7	25.3	10.1	7.2
Level of Service	B	C		C	C		C	B	B	C	B	A
Approach Delay (s)		21.3			21.5			17.1			13.4	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	16.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	61.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	5	9	791	538	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.67	0.67	0.92	0.97	0.69
Hourly flow rate (vph)	6	7	13	860	555	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					815	
pX, platoon unblocked	0.89	0.89	0.89			
vC, conflicting volume	1448	561	568			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1442	449	457			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	99	99			
cM capacity (veh/h)	129	545	987			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	13	873	568
Volume Left	6	13	0
Volume Right	7	0	13
cSH	223	987	1700
Volume to Capacity	0.06	0.01	0.33
Queue Length 95th (ft)	5	1	0
Control Delay (s)	22.2	0.4	0.0
Lane LOS	C	A	
Approach Delay (s)	22.2	0.4	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	12	20	779	31	31	526
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.67	0.92	0.69	0.69	0.97
Hourly flow rate (vph)	14	30	847	45	45	542
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)						1208
pX, platoon unblocked	0.96					
vC, conflicting volume	1501	869			892	
vC1, stage 1 conf vol	869					
vC2, stage 2 conf vol	632					
vCu, unblocked vol	1501	869			892	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	92			94	
cM capacity (veh/h)	330	351			760	

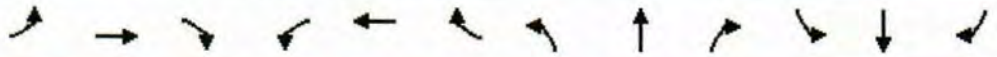
Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	44	892	30	557
Volume Left	14	0	30	15
Volume Right	30	45	0	0
cSH	344	1700	760	760
Volume to Capacity	0.13	0.52	0.06	0.06
Queue Length 95th (ft)	11	0	5	5
Control Delay (s)	17.0	0.0	10.0	1.1
Lane LOS	C		B	A
Approach Delay (s)	17.0	0.0	1.6	
Approach LOS	C			

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	20	171	106	120	62	582	169	159	495	37
v/c Ratio	0.07	0.42	0.46	0.30	0.26	0.77	0.25	0.53	0.50	0.05
Control Delay	21.7	18.2	29.4	11.7	31.2	24.5	6.8	35.4	14.8	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	18.2	29.4	11.7	31.2	24.5	6.8	35.4	14.8	7.9
Queue Length 50th (ft)	6	34	34	12	20	167	13	51	117	3
Queue Length 95th (ft)	13	67	75	36	64	366	57	#159	288	18
Internal Link Dist (ft)		390		352		498			210	
Turn Bay Length (ft)	60		90		100		100	100		100
Base Capacity (vph)	591	825	514	800	826	1203	1029	349	991	817
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.21	0.21	0.15	0.08	0.48	0.16	0.46	0.50	0.05

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												
Volume (vph)	10	62	61	84	29	74	53	512	157	138	426	28
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	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.97		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1695		1770	1627		1770	1863	1538	1770	1863	1529
Flt Permitted	0.68	1.00		0.59	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1266	1695		1102	1627		1770	1863	1538	1770	1863	1529
Peak-hour factor, PHF	0.50	0.73	0.71	0.79	0.72	0.92	0.86	0.88	0.93	0.87	0.86	0.75
Adj. Flow (vph)	20	85	86	106	40	80	62	582	169	159	495	37
RTOR Reduction (vph)	0	49	0	0	64	0	0	0	61	0	0	10
Lane Group Flow (vph)	20	122	0	106	56	0	62	582	108	159	495	27
Confl. Peds. (#/hr)			2			8			3			7
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	12.6	12.6		12.6	12.6		4.8	26.5	26.5	10.2	31.9	31.9
Effective Green, g (s)	12.6	12.6		12.6	12.6		4.8	26.5	26.5	10.2	31.9	31.9
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.08	0.43	0.43	0.17	0.52	0.52
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	260	348		227	334		139	805	665	295	969	796
v/s Ratio Prot		0.07			0.03		0.04	c0.31		c0.09	0.27	
v/s Ratio Perm	0.02			c0.10					0.07			0.02
v/c Ratio	0.08	0.35		0.47	0.17		0.45	0.72	0.16	0.54	0.51	0.03
Uniform Delay, d1	19.7	20.8		21.4	20.0		27.0	14.4	10.6	23.4	9.6	7.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.6		1.5	0.2		2.3	3.2	0.1	1.9	0.5	0.0
Delay (s)	19.8	21.5		22.9	20.3		29.3	17.6	10.7	25.3	10.1	7.2
Level of Service	B	C		C	C		C	B	B	C	B	A
Approach Delay (s)		21.3			21.5			17.1			13.4	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	16.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	61.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	5	9	791	538	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.67	0.67	0.92	0.97	0.69
Hourly flow rate (vph)	6	7	13	860	555	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					815	
pX, platoon unblocked	0.87	0.87	0.87			
vC, conflicting volume	1448	561	568			
vC1, stage 1 conf vol	561					
vC2, stage 2 conf vol	887					
vCu, unblocked vol	1440	426	433			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	99			
cM capacity (veh/h)	339	549	984			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	13	873	568
Volume Left	6	13	0
Volume Right	7	0	13
cSH	430	984	1700
Volume to Capacity	0.03	0.01	0.33
Queue Length 95th (ft)	2	1	0
Control Delay (s)	13.6	0.4	0.0
Lane LOS	B	A	
Approach Delay (s)	13.6	0.4	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	12	20	779	31	31	526
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.67	0.92	0.69	0.69	0.97
Hourly flow rate (vph)	14	30	847	45	45	542
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)						1208
pX, platoon unblocked	0.96					
vC, conflicting volume	1501	869			892	
vC1, stage 1 conf vol	869					
vC2, stage 2 conf vol	632					
vCu, unblocked vol	1501	869			892	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	92			94	
cM capacity (veh/h)	330	351			760	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	44	892	30	557
Volume Left	14	0	30	15
Volume Right	30	45	0	0
cSH	344	1700	760	760
Volume to Capacity	0.13	0.52	0.06	0.06
Queue Length 95th (ft)	11	0	5	5
Control Delay (s)	17.0	0.0	10.0	1.1
Lane LOS	C		B	A
Approach Delay (s)	17.0	0.0	1.6	
Approach LOS	C			

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		