Traffic Operations Analysis Report

I-80 Gilman Street Interchange Improvement Project Approval & Environmental Document

Alameda County, California

June 30, 2017

TJKM

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EXECUTIVE SUMMARY

This project is located in Alameda County at the I-80/Gilman Street interchange in the City of Berkeley (Post Miles 6.4 to 6.8). The purpose of the project is to simplify and improve navigation, mobility and traffic operations, reduce congestion, vehicle queues and conflicts, improve local and regional bicycle connections and pedestrian facilities and improve safety at the I-80/Gilman Street interchange. Current conditions, along with an overall increase in vehicle traffic, have created poor, confusing and unsafe operations in the interchange area for vehicles, pedestrians and bicyclists.

Under existing conditions, the I-80 ramp terminal intersections at Gilman Street are stop-control intersections and traffics on the I-80 off-ramps have to stop at Gilman Street. In order to improve traffic operation at the Gilman Street interchange, roundabout was proposed to replace stop-control intersections.

Existing Conditions

The congestion and queueing characteristic within the study area during the analysis periods are summarized below:

Weekday A.M. Peak Period (6:00-10:00 AM) Conditions

During the AM peak period, various levels of congestion were observed on westbound I-80. A detailed description of the network during weekday AM peak is provided below.

- Westbound directions are the peak directions during the AM peak period.
- No significant queues were observed at the study intersections.
- Heavy weaving was observed at the ramp intersections. Eastbound I-80 off-ramp/Gilman Street and westbound I-80 off-ramp/Gilman Street intersections operate at LOS C and LOS F, respectively during the AM peak hour.
- The queue on I-80 westbound off-ramp spills back to the mainline during the AM peak hour. No significant queues was observed on I-80 eastbound on and off ramps and westbound on-ramp.

Weekday PM Peak Period (3:00-7:00 PM) Conditions

During the p.m. peak period, various levels of congestion were observed on both eastbound I-80 and westbound I-80. A detailed description of the network during weekday PM peak is provided below.

- Both eastbound and westbound directions are the peak directions during the PM peak period.
- Heavy queues were observed at all the study intersections on the westbound Gilman Street between San Pablo Avenue and I-80 ramps.
- Queues were observed on I-80 eastbound on-ramp until the middle of the ramp.
- No queues were observed at I-80 eastbound off-ramp and I-80 westbound on and off-ramps.
- Both eastbound I-80 off-ramp/Gilman Street and westbound I-80 off-ramp/Gilman Street intersections operate at LOS F during the PM peak hour.

Future Traffic Demands

Future demand forecast was conducted for the following conditions with and without project:

- Near-Term (2020) Conditions
- Future (2040) Conditions

The 2040 traffic demand forecast was described in detail in the technical memorandum "Technical Memorandum for Travel Demand Model and Initial Results for I-80/Gilman Street Interchange Improvement PA&ED Project, July 6, 2016." The 2020 traffic demand forecast was interpolated from the 2015 and 2040 demands.

Intersection demands and I-80 ramp demands at Gilman Street interchange were balanced throughout the study area and utilized for future traffic operational analysis.

Alternatives Analysis

Two alternatives were proposed for consideration, as describe below:

Alternative 1: The No Build Alternative consists of the future conditions with transportation improvements only as currently planned and programmed for funding. The No Build Alternative provides a basis for comparing the build alternative.

Alternative 2: The Roundabout Alternative was developed to meet the identified purpose and need of the project, while avoiding or minimizing environmental impacts. The Roundabout Alternative includes the reconfiguration of I-80 ramps and intersections at Gilman Street. The existing non-signalized intersection configuration with stop-controlled ramp terminuses would be replaced with two hybrid single-lane roundabouts with multilane portions on Gilman Street at the I-80 ramp terminals. The I-80 ramps and frontage road intersections at each ramp intersection would be combined to form one single roundabout intersection. Gilman Street would be reconstructed from approximately 300 feet west of West Frontage Road to approximately 100 feet east of Fourth Street. Work would also include reconstruction of West Frontage Road and Eastshore Highway to allow for the minimum amount of spacing between ramp intersections and local intersections. In addition, Eastshore Highway would be converted from two lanes to one lane entering the roundabout in order to reduce the number of conflicts.

Short-Term Benefits

The operating conditions were analyzed using the Synchro/Simtraffic for No Build Alternative and using SIDRA for Build Alternative during the AM and PM peak hours. The 2020 horizon year analysis shows the following improvement in operations:

AM Peak Hour:

- The Gilman Street/Frontage Rd and the Gilman Street/ westbound I-80 ramps intersections level of service improve from LOS F to LOS C.
- The Gilman Street/eastbound I-80 ramps intersection level of service improves from LOS D to LOS B and the Gilman Street /Eastshore Highway intersections level of service improves from LOS F to LOS B.

PM Peak Hour:

- The Gilman Street/Frontage Road and the Gilman Street/westbound I-80 ramps intersections level of service improve from LOS F to LOS D.
- The Gilman Street/eastbound I-80 ramps and the Gilman Street/Eastshore Highway intersections level of service improves from LOS F to LOS B.

Long-Term Benefits

The operating conditions were analyzed using the Synchro/Simtraffic for No Build Alternative and using SIDRA for Build Alternative during the AM and PM peak hours. The 2040 horizon year analysis shows the following improvement in operations:

AM Peak Hour:

- The Gilman Street/Frontage Road and the Gilman Street / westbound I-80 ramps intersections level of service remains at LOS F. The delay on the Frontage Road for the Build Alternative is expected to be half a minutes versus over 10 minutes for the No Build Alternative. The delay on the westbound ramps for the Build Alternative is expected to be three minutes versus over 10 minutes for the No Build Alternative.
- The Gilman Street/eastbound I-80 ramps intersection level of service improves from LOS C to LOS A and the Gilman Street /Eastshore Highway intersections level of service improves from LOS F to LOS A

PM Peak Hour:

- The Gilman Street/Frontage Road and the Gilman Street / westbound I-80 ramps intersections level of service improve from LOS F to LOS E during the PM peak hour. The delay on the westbound ramps for the Build Alternative is expected to be less than half a minute versus over 10 minutes for the No Build Alternative.
- The Gilman Street/eastbound I-80 ramps intersection level of service improves from LOS C to LOS B and the Gilman Street/Eastshore Highway intersections level of service improves from LOS F to LOS B during the PM peak hour.

It is also important to recognize that the queue lengths are projected to reduce significantly under the Build scenario on the I-80 eastbound off-ramp and on the I-80 westbound off-ramp to Gilman Street in both 2020 and 2040 Conditions.

1.0. INTRODUCTION

This project is located in Alameda County at the I-80/Gilman Street interchange in the City of Berkeley (Post Miles 6.4 to 6.8). The purpose of the project is to simplify and improve navigation, mobility and traffic operations, reduce congestion, vehicle queues and conflicts, improve local and regional bicycle connections and pedestrian facilities and improve safety at the I-80/Gilman Street interchange. Current conditions, along with an overall increase in vehicle traffic, have created poor, confusing and unsafe operations in the interchange area for vehicles, pedestrians and bicyclists.

The project study limits for arterial traffic analysis includes Gilman Street between the I-80 interchange and San Pablo Avenue, which will help understand how the corridor operates and identify improvement needs. The vicinity map and study intersections are shown in **Figure 1**.

This report includes seven sections: Introduction is in Section 1. Section 2 identifies the various data and information sources used in preparing this report. The existing roadway infrastructure and existing intersection LOS are described in Section 3. Analysis alternatives are presented in Section 4. The future 2020 and 2040 demand forecast volumes are discussed in Section 5. Future intersections LOS and queue length in Section 6. Conclusion is in Section 7.

Vicinity Map

Figure 1

2.0. DATA COLLECTION

This study includes the analysis of operating conditions of 13 study intersection along Gilman Street during the weekday AM peak hour (8:00-9:00 AM) and the weekday PM peak hour (5:00-6:00 PM). To support this analysis, extensive field observations, data compilation and primary data collection were conducted. The types of data relevant to this effort and the source for these data are presented in **Table 1**.

This data was derived from a variety of sources, as shown in **Table 1**.

Table 1: Relevant Data Sources

Data Type	Source(s)	Dates
Freeway Ramps and Arterial Geometry	Aerial photographs	Jan. 2016
	TJKM conducted field review to confirm current freeway and arterial geometry	Jan. 2016
Intersection Signal Timing	City of Berkley and Caltrans	May 2016
Freeway Mainline Traffic Volumes	Caltrans Census, PeMS Data	2011
Ramp Traffic Volumes	Caltrans Census, PeMS Data	2011
Freeway Truck Volumes/Percentages	Caltrans 2014 report on Truck Traffic volumes	2014
Freeway HOV Percentages	PeMS Data	From Sept. 2015 to Nov. 2015
Freeway Accident and Incident Data	TASAS summary for study segment of I-80	From Jan. 2011 to Dec. 2013
Intersection Traffic Volumes	TJKM conducted four-hour manual traffic counts	Jan. 2016

Source: TJKM, 2016

3.0. EXISTING CONDITIONS

A detail description of existing conditions was provided in the previously submitted technical memorandum entitled "The I-80 Gilman Street Interchange Improvement- Existing Conditions Report dated August 23, 2016." A summary of the existing operating and field conditions is provided in the section below.

3.1. I-80 Freeway Geometry

Within the limits of the proposed project, I-80 is a conventional 10-lane freeway including one high-occupancy vehicle (HOV) lane in each direction with 12-foot lanes and 11-foot shoulders. There are several different types of interchanges along the corridor. All on-ramps and off-ramps have a single lane at the freeway junction.

3.2. Arterial Geometry

In addition to the freeway, the study network encompasses the intersections along Gilman Street. An extensive local roadway that is described below serves Gilman Street within the project limits.

Gilman Street

Gilman Street is the north most direct access point from I-80 to the City of Berkley. It is a major east-west arterial roadway with one lane in each direction. The street primarily serves high concentrations of industrial land uses that result in a high percentage of heavy vehicle traffic. Gilman Street also provides direct access to Golden Gate Fields adding more traffic to the roadway especially during the weekends and event days. An at-grade crossing is present at the UPRR tracks on Gilman Street that not only creates congestion but also potential safety hazards. The posted speed limit along Gilman Street within the study limits of this project is 25 miles per hour (mph).

West Frontage Road

West Frontage Road extends between Gilman Street to the south city limit of the City of Emeryville with one lane in each direction. The posted speed limit along this roadway is 35 mph.

Eastshore Highway

Eastshore Highway is a two-lane collector street that runs parallel to I-80 along the western portion of the study limits. This roadway serves as an access road to several residential and collector streets in the study area. It provides direct access to the I-80 eastbound ramps. Eastshore Highway has one lane in each direction with a posted speed limit of 25 mph.

Second Street

Second Street is a north-south local roadway with a posted speed limit of 25 mph. Second Street begins north of Gilman Street and terminates at Addison Street. Second Street has one lane in each direction with on-street parking. The majority of land uses along Second Street are for industrial and warehouse purposes.

Fourth Street

Fourth Street is a north-south, collector roadway that extends between Harrison Street just north of Gilman Street to Dwight Way in the south. It serves industrial and commercial land uses. Fourth Street has one lane in each direction with a posted speed limit of 25 mph.

Sixth Street

Sixth Street has one lane in each direction with on-street parking, left-turn lanes at major intersections, and bike lanes along portions of its roadway. The collector street designation of Sixth Street extends from Gilman Street in

the north to the merging point of Seventh Street (Dwight Crescent) at Dwight Way. Sixth Street runs through predominantly residential land uses and provides access to University Village to the north. The posted speed limit is 25 mph within the study limits.

Seventh Street

Seventh Street provides two travel lanes with on-street parking and left-turn pockets at major intersections through the center of West Berkeley. Seventh Street is designated as the collector street. Seventh Street facilitates mostly industrial and artisan land uses and the posted speed limit is 25 mph within the project's study limits.

Eight Street

Eight Street has one lane in each direction with on-street parking. Eight Street runs from Harrison Street to Heinz Avenue with the only signalized intersection located at Gilman Street. Eight Street runs adjacent to several residential and institutional properties and provides access to University Village to the north. The posted speed limit is 25 mph.

Ninth Street

Ninth Street has two travel lanes available with permitted on-street parking. Ninth Street is designated as a north-south bicycle boulevard. Ninth Street is designated as a local roadway that extends between Harrison Street and terminates at Heinz Avenue. Its intersection with Gilman Street is stop controlled. The majority of land uses along Ninth Street are residential and the posted speed limit is 25 mph.

Tenth Street

Tenth Street is a north-south two-lane local roadway. On-street parking is provided along this street. Tenth Street begins north of Gilman Street and runs south to Heinz Avenue, with mostly residential land uses along the street. The posted speed limit is 25 mph.

Harrison Street

Harrison Street is an east-west local roadway with one lane in each direction and on-street parking. There are primarily industrial and institutional land uses on Harrison Street. This roadway extends between Fourth Street and terminates east of San Pablo Avenue. The posted speed limit is 25 mph.

San Pablo Avenue (SR 123)

San Pablo Avenue (SR 123) is the north-south backbone of West Berkley and functions in a number of somewhat conflicting roles for the City and the region. Its classification by Caltrans as a state route (SR) traditionally indicates a focus on moving automobiles and heavy vehicle traffic for travel on a regional scale. With the development of I-80/I-580 as the primary regional travel routes in the area, portions of San Pablo Avenue have slowly transformed into a neighborhood scale travel corridor, incorporating streetscape improvements and context sensitive design features targeted at non-motorized modes of transportation. The corridor is heavily used by AC Transit services. The posted speed limit is 30 mph within the study limits. San Pablo Avenue has two lanes in each direction.

A total of 13 study intersections are included in the study network. The study intersections and associated traffic controls are as follows:

- West Frontage Road/Gilman Street (Two-way Stop)
- I-80 Westbound Off-Ramp/Gilman Street (One-way Stop)
- I-80 Eastbound Off-Ramp/Gilman Street (One-way Stop)
- Eastshore Highway/Gilman Street (Two-way Stop)
- Second Street/Gilman Street (One-way Stop)
- Fourth Street/Gilman Street (Two-way Stop)
- Sixth Street/Gilman Street (Signalized)
- Eight Street/Gilman Street (Signalized)
- Ninth Street/Gilman Street (Signalized)
- Tenth Street/Gilman Street (Two-way Stop)
- San Pablo Avenue/Gilman Street (Two-way Stop)
- Eastshore Highway/Harrison Street (Two-way Stop)
- Second Street/Harrison Street (Two-way Stop)

The lane configuration at each of the study intersections are illustrated in **Figure 2**.

Figure 2: Existing Conditions Lane Geometry and Intersection Controls

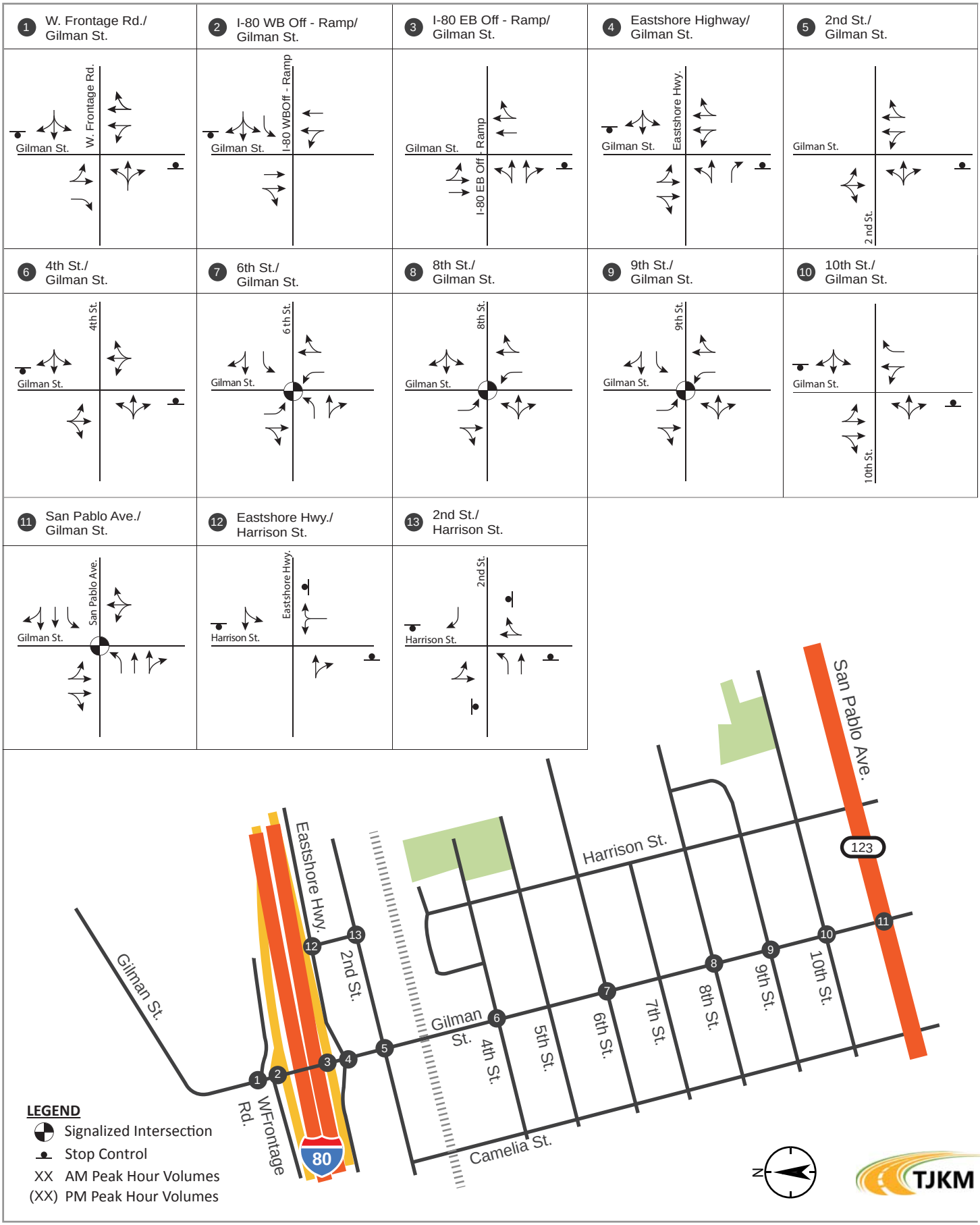


Figure 2

3.3. Intersection Turning Movement Volumes

To support the modeling and analysis of the study intersections, TJKM collected existing roadway geometric data and traffic volumes along the study intersections on January 27, 2016, covering both AM peak periods (6:00-10:00 AM) and PM peak periods (3:00-7:00 PM). Intersection turning movement counts along Gilman Street were balanced among all study intersections and with I-80 ramps at the Gilman Street interchange. Intersection turning movement volumes after balancing are shown in **Figure 3**.

3.4. Truck Volume and Percentage

In the project area, there are three locations included in the "2014 Annual Average Daily Truck Traffic on the California State Highway System", as listed in **Table 2**. On average, the truck percentage on I-80 in this project area is about 4.8 percent and average truck percentage on Gilman Street is about 6.2 percent.

Table 2: Truck Percentages and Volumes on I-80 and Gilman Street

Route	County	Post Mile	Leg	Description	Vehicle AADT	Truck AADT	% Truck
I-80	Alameda	3.786	A	Emeryville, Powell Rd	277,000	13,267	4.79
I-80	Alameda	4.582	B	Berkeley, Jct. Rte. 13 East	277,000	13,325	4.81
I-80	Alameda	4.582	A	Berkeley, Jct. Rte. 13 East	269,000	12,831	4.77
I-80	Alameda	6.62	B	Berkeley, Gilman Street St	267,000	*N/A*	*N/A*
I-80	Alameda	6.62	A	Berkeley, Gilman Street St	274,000	*N/A*	*N/A*
Gilman Street	Alameda	-	-	Gilman Street, East of I-80	17,121	*N/A*	8
Gilman Street	Alameda	-	-	Gilman Street, West of 6th Street	17,121	*N/A*	5

Source: 2014 Caltrans Annual Average Daily Truck Traffic

Existing Conditions Intersection Volumes

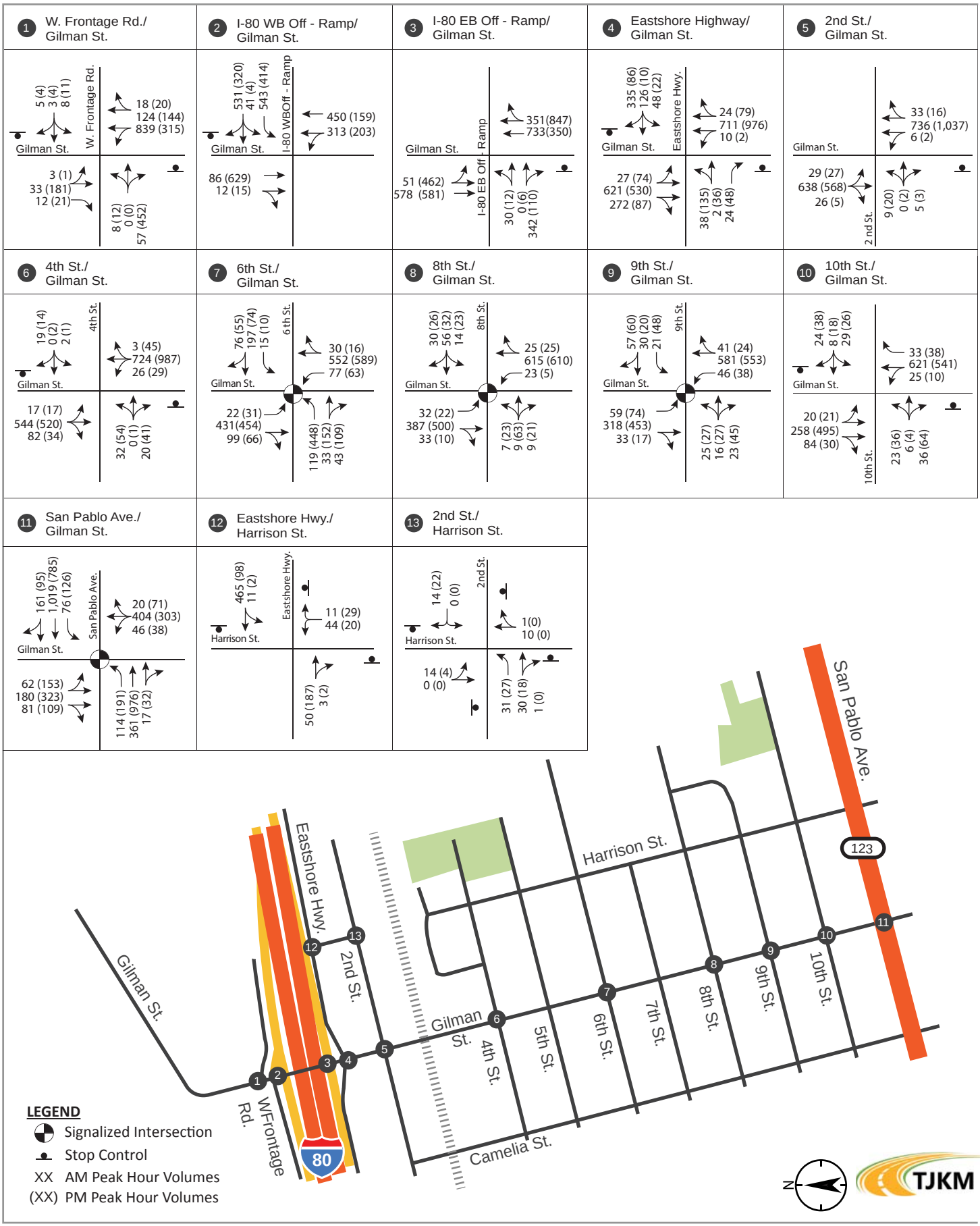


Figure 3

3.5. Intersection Level-of-Service

In order to determine study intersection performance, Synchro models were developed based on the geometry obtained from the aerial photos and field observation. Signal timing cards received from the City of Berkeley were used to code the signal timing for signalized intersection within study area. The AM and PM peak hour LOS for each study intersections was determined using Synchro and the procedures from the 2000 Highway Capacity Manual (HCM) Operational Methodology. As a part of this methodology, the average delay per vehicle is used to determine the intersection LOS. The AM peak hour is from 8:00-9:00 AM while the PM peak hour is from 5:00-6:00 PM. The results of this analysis are presented in **Table 3**. Synchro outputs files and approach LOS are attached in **Appendix B**.

Table 3: Intersection Existing Level-of-Services

ID	Intersection	Control Type	AM Peak		PM Peak	
			Delay [a] (sec/veh)	LOS [b]	Delay [a] (sec/veh)	LOS [b]
1	Gilman St. at Frontage Rd.	TWSC [c]	>50.0	**F**	>50.0	**F**
2	Gilman St. at WB I-80 Ramps	TWSC [c]	>50.0	**F**	>50.0	**F**
3	Gilman St. at EB I-80 Ramps	TWSC [c]	18.9	**C**	>50.0	**F**
4	Gilman St. at Eastshore Hwy.	TWSC [c]	>50.0	**F**	>50.0	**F**
5	Gilman St. at Second St.	TWSC [c]	26.8	D	41.1	**E**
6	Gilman St. at 4th St.	TWSC [c]	74.2	**F**	>50.0	**F**
7	Gilman St. at 6th St.	Signal	15.3	B	23.7	C
8	Gilman St. at 8th St.	Signal	8.3	A	7.6	A
9	Gilman St. at 9th St.	Signal	8.8	A	9.8	A
10	Gilman St. at 10th St.	TWSC [c]	27.7	D	49.8	**E**
11	Gilman St. at San Pablo Ave.	Signal	31.6	C	35.6	D
12	Eastshore Hwy. at Harrison St.	AWSC [d]	12.3	B	8.2	A
13	Second St. at Harrison St.	AWSC [d]	6.9	A	6.8	A

Source: TJKM, 2016
Notes:
a. Delay in seconds per vehicle. For Signalized and all-way-stop controlled intersections, overall (intersection) delay reported. For two-way stop-control intersections, the worst approach is reported.
b. LOS-Level of Service.
c. TWSC-Two-way-stop-control. Delay and LOS of the worst approach are reported.
d. AWSC-All-way-stop-control.

All the signalized and all-way-stop intersections operate at LOS D or better, while most of the two-way-stop-control intersections operate at LOS E or F during at least one peak hour, due to the high traffic volumes on Gilman Street and delay on the worst approach was reported. Under existing conditions, the queue on westbound I 80 off-ramp spills back to the mainline during the AM peak hour.

The intersection 95 percent queue length was extracted from Simtraffic as shown in **Table 4.**

Table 4: Intersection 95% Queue Length

ID	Intersection	Lane Group	Storage Length (ft)	Existing Conditions	
				AM	PM
1	Gilman St. at Frontage Rd.	EBLT		0	70
		EBR		0	0
		WBLT	55	67	68
		WBTR		10	0
		NBLTR		48	288
		SBLTR		39	48
2	Gilman St. at WB I-80 Ramps	EBT	55	21	92
		EBTR		10	93
		WBLT	190	55	110
		WBT		0	37
		SBL	600	1225	488
		SBLTR	1156	1177	557
3	Gilman St. at EB I-80 Ramps	EBLT	190	64	241
		EBT		0	77
		WBT	50	21	19
		WBTR		41	39
		NBLT	700	57	42
		NBTR		142	105
4	Gilman St. at Eastshore Hwy.	EBLT	50	46	31
		EBTR		31	0
		WBLT	130	87	9
		WBTR		23	80
		NBLT	40	67	153
		NBTR		40	131
		SBLTR		172	174
5	Gilman St. at Second St.	EBLT	130	36	89
		WBLT	265	59	0
		WBTR		0	24
		NBLTR		33	36
6	Gilman St. at 4th St.	EBLT	250	39	116
		EBR		0	31

ID	Intersection	Lane Group	Storage Length (ft)	Existing Conditions	
				AM	PM
		WBLT	260	82	172
		WBR	75	0	0
		NBLTR		45	101
		SBLTR		33	41
7	Gilman St. at 6th St.	EBL	50	74	264
		EBTR	140	162	195
		WBL	80	117	99
		WBTR	245	316	291
		NBL	90	121	117
		NBTR		142	580
		SBL	65	51	31
		SBTR		185	88
8	Gilman St. at 8th St.	EBL	50	35	34
		EBTR	260	90	162
		WBL	65	65	15
		WBTR	245	198	91
		NBLTR		43	116
		SBLTR		103	84
9	Gilman St. at 9th St.	EBL	80	64	82
		EBTR	250	45	140
		WBL	75	88	69
		WBTR	260	248	225
		NBLTR		63	103
		SBL	90	38	69
		SBTR		70	78
10	Gilman St. at 10th St.	EBLT	260	52	42
		EBTR	50	49	56
		WBLT	265	155	72
		WBR	75	20	27
		NBLTR		75	73
		SBLTR		58	80
11	Gilman St. at San Pablo Ave.	EBLT	265	114	228

ID	Intersection	Lane Group	Storage Length (ft)	Existing Conditions	
				AM	PM
		EBTR		106	183
		WBLTR	200	348	366
		NBL	160	124	219
		NBT		122	362
		NBTR		95	322
		SBL	150	161	198
		SBT		278	302
		SBTR		289	281
12	Eastshore Hwy. at Harrison St.	WBLR	205	64	184
		NBTR		45	49
		SBLT		410	356
13	Second St. at Harrison St.	EBLT	205	26	14
		WBTR		33	0
		NBL		42	46
		NBTR	600	49	41
		SBLTR	540	32	55

Source: TJKM, 2016

4.0. ALTERNATIVES ANALYSIS

Two alternatives were proposed for consideration, as describe below.

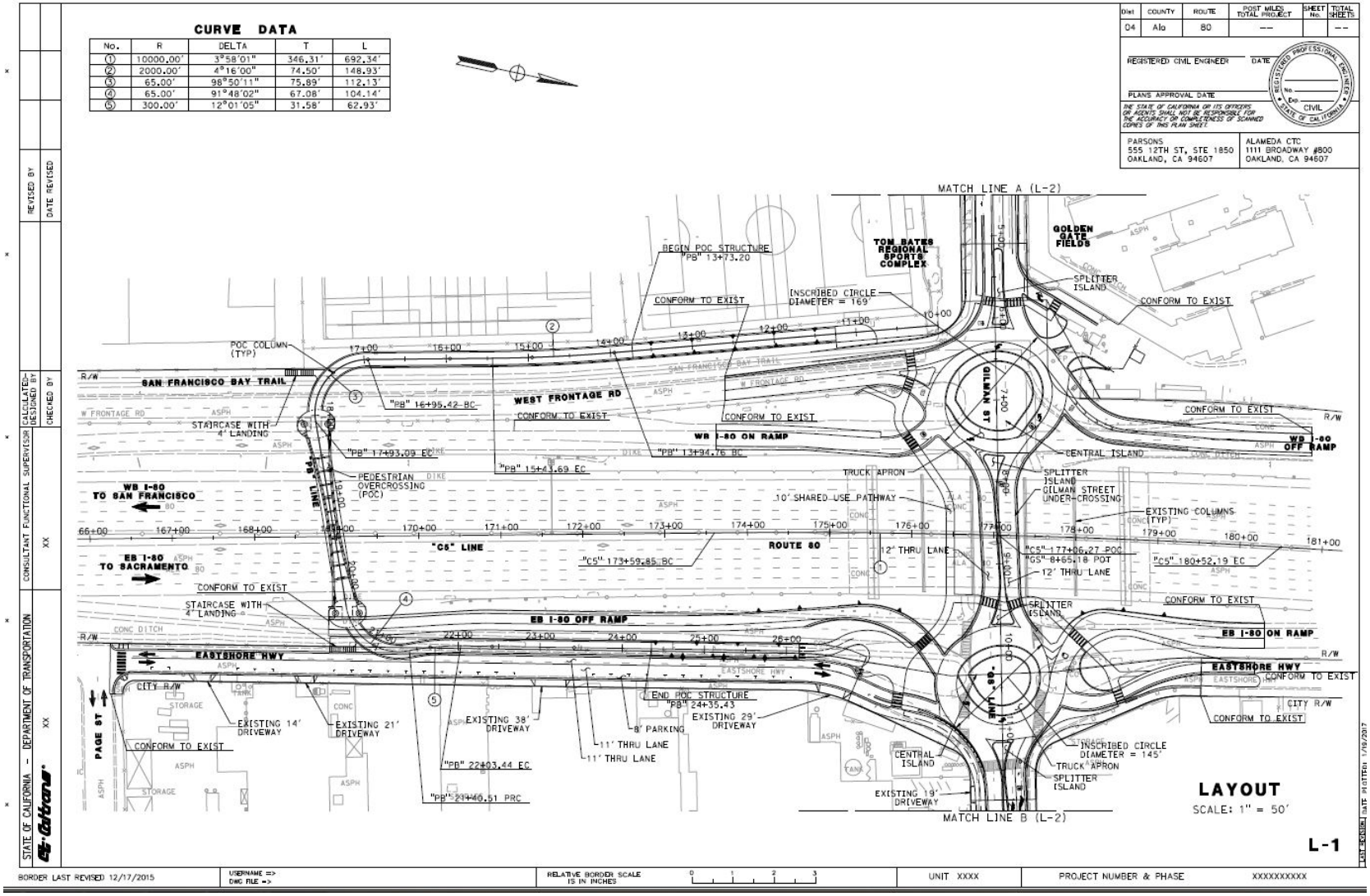
Alternative 1: The No Build Alternative consists of the future conditions with transportation improvements only as currently planned and programmed for funding. The No Build Alternative provides a basis for comparing the build alternative.

Alternative 2: The Roundabout Alternative was developed to meet the identified purpose and need of the project, while avoiding or minimizing environmental impacts. The Roundabout Alternative includes the reconfiguration of I-80 ramps and intersections at Gilman Street. The existing non-signalized intersection configuration with stop-controlled ramp terminuses would be replaced with two hybrid single-lane roundabouts with multilane portions on Gilman Street at the I-80 ramp terminals. The I-80 ramps and frontage road intersections at each ramp intersection would be combined to form one single roundabout intersection. Gilman Street would be reconstructed from approximately 300 feet west of West Frontage Road to approximately 100 feet east of Fourth Street. Work would also include reconstruction of West Frontage Road and Eastshore Highway to allow for the minimum amount of spacing between ramp intersections and local intersections. In addition, Eastshore Highway would be converted from two lanes to one lane entering the roundabout in order to reduce the number of conflicts. During this reconfiguration, pavement preservation (mill and overlay) would be implemented.

These improvements associated with the installation of the roundabouts would extend approximately 340 feet south on West Frontage Road from the Gilman Street interchange and 650 feet north and 1,100 feet south on Eastshore Highway from the Gilman Street interchange. Work associated with the reconfiguration of the eastbound I-80 off-ramp and on-ramp would extend 800 feet south and 250 feet north, respectively. Work associated with the reconfiguration of the westbound I-80 off-ramp and on-ramp would extend 300 feet north and 210 feet south, respectively. There are no proposed improvements to the freeway mainline.

The western roundabout intersection would consist of four approaching legs: eastbound and westbound Gilman Street, West Frontage Road and I-80 westbound off-ramp. The eastern roundabout intersection would include a total of five approaching legs: I-80 eastbound off-ramp, northbound and southbound Eastshore Highway, and eastbound and westbound Gilman Street. Left-turn pockets would be provided on Gilman Street for vehicles turning onto Second Street. The Proposed Alternative is illustrated in **Figure 4**.

Figure 4: Proposed Alternatives



5.0. TRAVEL DEMAND FORECASTS

Future demand forecast was conducted for the following conditions with and without project:

- Near-Term (2020) Conditions
- Future (2040) Conditions

The 2040 traffic demand forecast was described in detail in the technical memorandum "Technical Memorandum for Travel Demand Model and Initial Results for I-80/Gilman Street Interchange Improvement PA&ED Project, July 6, 2016." The 2020 traffic demand forecast was interpolated from the 2015 and 2040 demands.

The future (both 2020 and 2040) I-80 off-ramp demands at the Gilman Street interchange were constrained by maintaining the ratio of the off-ramp forecast demands to mainline forecast demands in relation to the existing volume.

Likewise, the future I-80 on-ramp demands at Gilman Street interchange were constrained based on the westbound Gilman Street constrained demands. The westbound demands along Gilman Street were constrained due to the fact that Gilman Street has one lane in either direction and a capacity of 1,100 vehicles per hour per lane was used to constrain the demands on Gilman Street taking into account signalized intersections between San Pablo Avenue and Fourth Street. Based on the constraint applied on Gilman Street the demands on the on-ramps from both eastbound and westbound I-80 and frontage road were proportionally constrained during the peak hour. It should be noted that under 2020 conditions, the demands on Gilman Street are almost the same as Existing Conditions; therefore, no constraint was applied to the 2020 demands along Gilman Street. Intersection demands and I-80 ramp demands at Gilman Street interchange were balanced throughout the study area and utilized for future traffic operational analysis. The 2020 and 2040 unconstrained and constrained ramp and mainline demand volumes at the Gilman Street interchange are attached in **Appendix A**.

Under the existing conditions, the network peak hours during the AM and PM peak periods are 8:00-9:00 AM and 5:00-6:00 PM, respectively. Similarly, it is projected that the highest demands within the study area occurs during 8:00-9:00 AM and 5:00-6:00 PM based on the review of future (2020 and 2040) conditions. In order to ensure that the queues from downstream intersections do not extend into the off-ramp intersections and block freeway off-ramps, we propose to evaluate study intersections between 8:00-9:00 AM and 5:00-6:00 PM as peak hours.

Figures 5 and **6** show 2020 and 2040 constrained peak hour demands for the study intersections. In 2040, significant congestion were observed on the freeway, which results in less traffic getting off to the Gilman Street interchange.

A select link analysis from the validated Alameda CTC Model was performed to understand the origin of the northbound West Frontage Road trips during the PM peak hour for the 2040 conditions. The analysis found that 45 % of the trips are from San Francisco, 14% of the trips are from northbound I-880, and 41% of the trips are from Emeryville. Due to the severe congestion on the eastbound I-80 during the PM peak, northbound West Frontage Road will be used as an alternative route to avoid I-80. This analysis indicates that about 60% of the traffic on northbound West Frontage Road is from I-880 and San Francisco and getting off I- 80 and using the West Frontage Road and Gilman Street to get back on to I-80 to avoid the congestion on I-80.

The above OD patterns are based on the information in the July 6, 2016 technical memo for travel demand which was approved by D4 planning. Within the study area, the Alameda CTC Travel Demand Model was validated for the segment/link volumes (approach link and departure link volumes) and screenline volumes. Thus, the OD patterns within the study area are considered to be "validated" since the approach and departure link volumes represent the origins and destinations of trips.

Intersection Constrained Demands 2020

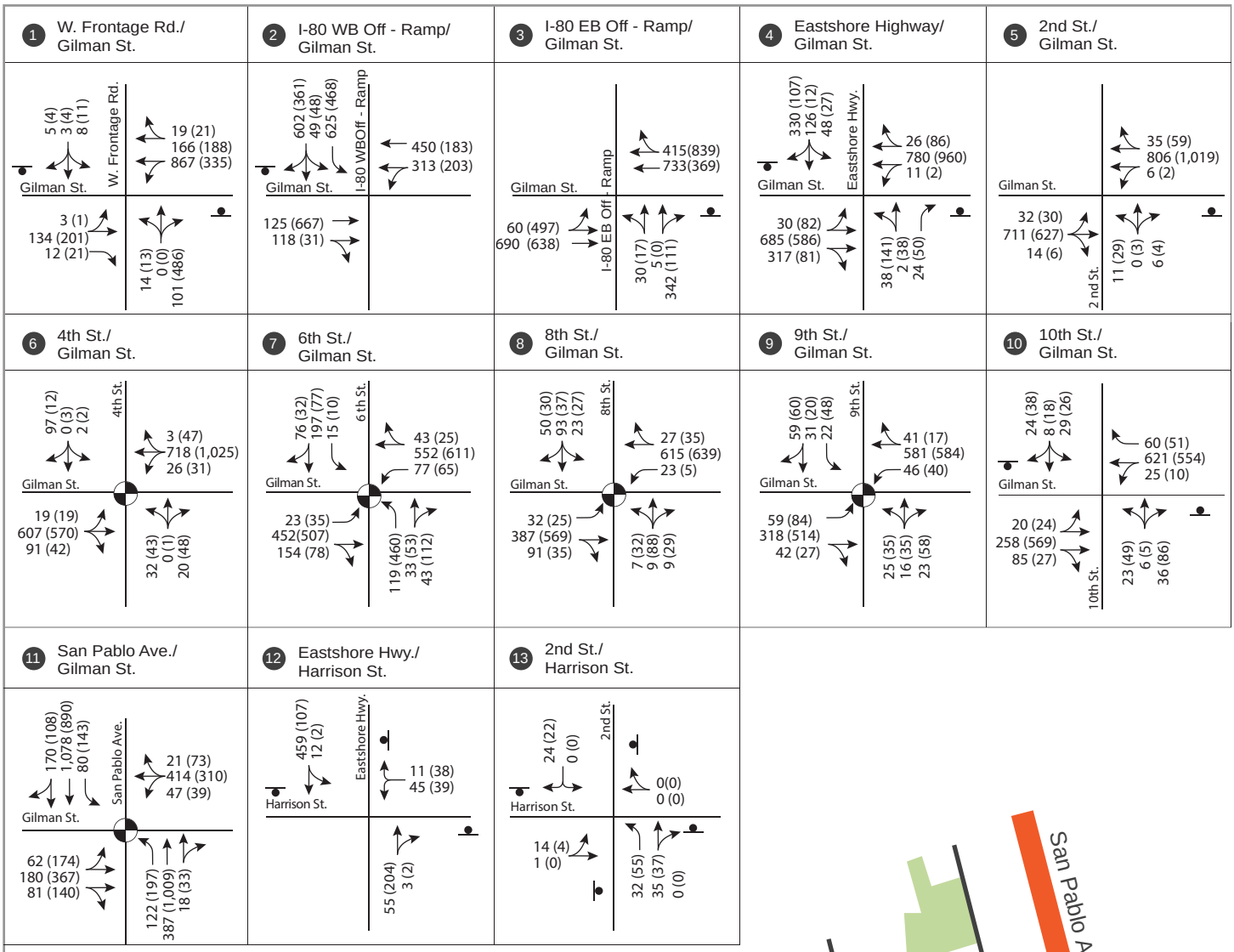


Figure 5

Intersection Constrained Demands 2040

Figure 6

6.0. FUTURE INTERSECTION LEVEL OF SERVICE ANALYSIS

In order to determine the study intersection performance, Synchro models were developed with balanced constrained future demands. The No Build Alternative was conducted by TJKM while the Build Alternative was analyzed by Omni Means. The No Build AM and PM peak hour levels of service for each study intersections was determined using Synchro and the procedures from the 2000 HCM Operational Methodology under the No Build Alternative. As a part of this methodology, the average delay per vehicle is used to determine the intersection LOS. The AM peak hour is from 8:00-9:00 AM while the PM peak hour is from 5:00-6:00 PM.

The Build (Roundabouts) AM and PM peak hour levels of service and queue length for proposed roundabouts was determined using SIDRA, HCM 2010 Methodology and Parameters (CA Roundabout). The level of service results are presented in **Tables 5** and **6** for 2020 and 2040 conditions, respectively. Ninety-five percent intersection peak hour queue lengths for 2020 and 2040 conditions were extracted from Simtraffic and SIDRA, as shown in **Tables 7** and **8**. Synchro/Simtraffic and SIDRA outputs files and approach LOS are attached in **Appendix B**.

The westbound I-80 and eastbound I-80 ramp intersections are closely spaced. As such, the operations at one ramp intersection will impact the operations at the adjacent ramp intersection, The network module in SIDRA takes into account the queue spill back from one ramp intersection to the adjacent ramp intersection. To model these interactions, the network module tool in SIDRA was utilized to analyze the build operations.

In 2020, all the intersections from #1 to #4 operate at LOS F with one exception that the intersection of I-80 eastbound Ramps/Gilman Street (intersection #3) operates at LOS D during the AM peak hour for the No Build scenario. With the Build scenario (Roundabout), intersections from #1 to #4 operates at LOS D or better. All the intersections from #5 to #13 operates at the same delay and LOS for both No Build and Build scenarios and they operate at LOS D or better with one exception that the intersection of Gilman Street /10th St operates at LOS F during the PM peak hour.

Under 2040 conditions, all the intersections from #1 to #4 operate at LOS F with one exception that the intersection of I-80 eastbound Ramps/Gilman Street (intersection #3) operates at LOS C during both the AM and PM peak hours for the No Build scenario. Under 2040 No Build conditions, it is projected that the westbound off-ramp traffic during the AM peak hour will experience significant delays at the off-ramp due to limited number of gaps in the traffic on Gilman Street. For the Build scenario (Roundabout), during the AM peak hour intersections #1 and 2 are projected to continue to operate at LOS F similar to No-Build scenario. The average delay is projected to be reduced significantly at the intersections under the Build scenario compared to No Build scenario. The LOS at intersections #3 and 4 is projected to improve from LOS F to LOS A during AM peak hour and from LOS F to LOS B during the PM peak hour compared to No Build scenario. In addition, two more intersections (Gilman Street at 10th St and Gilman Street at San Pablo Avenue) are projected to operate at LOS F during both AM and PM peak hours, similar to No Build scenario. All other intersections are projected to operate at LOS D or better.

Intersections #1 and 2 are projected to operate at LOS F, during the AM peak hour under Future No Build and Build scenarios, due to the heavy queue jumping demand using the frontage road as an alternative to I 80 in the peak direction of travel. Under existing conditions, significant amount of traffic exists the freeway at Gilman Street off-ramp during the AM peak hour and use frontage road between Gilman Street and University Avenue to be ahead of the queue. This pattern is projected to continue and grow with increase in traffic demands along I 80 and as a result the queue jumping demand is projected to be higher than existing conditions and as a result the intersections are projected to operate at LOS F. It should be noted that this analysis does not take into account the constrained demand in the future at the off-ramps at Gilman Street. It is likely that with the growth in traffic

demands in the future, the projected demand (queue jump) at the interchange may not occur as the demand will be controlled by upstream bottlenecks and throughput along the corridor.

From **Tables 7** and **8**, the queue length on both I-80 eastbound off-ramp and I-80 westbound off-ramp reduce significantly with the proposed Build scenario under both 2020 and 2040 conditions. Under the No Build scenario, the queue on westbound I 80 off-ramp spills back to the mainline during the AM peak hour in both 2020 and 2040 conditions. Under the Build scenario, the queue on westbound I 80 off-ramp spills back to the mainline during the AM peak hour under 2040 conditions not 2020 conditions. The queue on eastbound Gilman Street is not expected to spill back into the proposed roundabout and block the off-ramps traffic.

Table 5: Intersection Level-of-Services in 2020

ID	Intersections	Control Type		2020 AM Peak Hour				2020 PM Peak Hour			
				No Build		Build		No Build		Build	
		No Build	Build	Delay[a] (sec/veh)	LOS[b]	Delay[a] (sec/veh)	LOS[b]	Delay[a] (sec/veh)	LOS[b]	Delay[a] (sec/veh)	LOS[b]
1	Gilman St. at Frontage Rd.	TWSC [c]	Roundabout	>50.0	**F**	27.9	C	>50.0	**F**	43.2	D
2	Gilman St. at WB I-80 Ramps	TWSC [c]	Roundabout	>50.0	**F**			>50.0	**F**		
3	Gilman St. at EB I-80 Ramps	TWSC [c]	Roundabout	27.3	D	10.9	B	>50.0	**F**	17.1	B
4	Gilman St. at Eastshore Hwy.	TWSC [c]	Roundabout	>50.0	**F**			>50.0	**F**		
5	Gilman St. at Second St.	TWSC [c]	TWSC [c]	32.2	D	32.2	D	>50.0	**F**	>50.0	**F**
6	Gilman St. at Fourth St.	Signal	Signal	7.8	A	7.8	A	9.7	A	9.7	A
7	Gilman St. at Sixth St.	Signal	Signal	15.6	B	15.6	B	25.5	C	25.5	C
8	Gilman St. at Eighth St.	Signal	Signal	9.1	A	9.1	A	8.2	A	8.2	A
9	Gilman St. at Ninth St.	Signal	Signal	9.0	A	9.0	A	10.5	B	10.5	B
10	Gilman St. at 10th St.	TWSC [c]	TWSC [c]	27.7	D	27.7	D	>50.0	**F**	>50.0	**F**
11	Gilman St. at San Pablo Ave.	Signal	Signal	41.2	D	41.2	D	42.6	D	42.6	D
12	Eastshore Hwy. at Harrison St.	AWSC [d]	AWSC [d]	12.2	B	12.2	B	8.4	A	8.4	A
13	Second St. at Harrison St.	AWSC [d]	AWSC [d]	6.9	A	6.9	A	7.0	A	7.0	A

Source: TJKM, 2016

Notes:

a. Delay in seconds per vehicle. For Signalized and all-way stop controlled intersections, over-all (intersection) delay reported. For two-way-stop-control intersections, the worst approach are reported.

b. LOS - Level of Service.

c. TWSC - Two-way-stop-control. Delay and LOS of the worst approach are reported.

d. AWSC - All-way-stop-control.

Table 6: Intersection Level-of-Services in 2040

ID	Intersections	Control Type		2040 AM Peak Hour				2040 PM Peak Hour			
				No Build		Build		No Build		Build	
		No Build	Build	Delay[a] (sec/veh)	LOS[b]	Delay[a] (sec/veh)	LOS[b]	Delay[a] (sec/veh)	LOS[b]	Delay[a] (sec/veh)	LOS[b]
1	Gilman St. at Frontage Rd.	TWSC [c]	Roundabout	>50.0	**F**	123.2	**F**	>50.0	**F**	59.9	E
2	Gilman St. at WB I-80 Ramps	TWSC [c]	Roundabout	>50.0	**F**			>50.0	**F**		
3	Gilman St. at EB I-80 Ramps	TWSC [c]	Roundabout	24.7	C	9.6	A	>50.0	**F**	17.3	B
4	Gilman St. at Eastshore Hwy.	TWSC [c]	Roundabout	>50.0	**F**			>50.0	**F**		
5	Gilman St. at Second St.	TWSC [c]	TWSC [c]	38.0	**E**	45.8	**E**	>50.0	**F**	>50.0	**F**
6	Gilman St. at Fourth St.	Signal	Signal	7.9	A	7.9	A	8.3	A	8.3	A
7	Gilman St. at Sixth St.	Signal	Signal	14.5	B	14.5	B	32.5	C	32.5	C
8	Gilman St. at Eighth St.	Signal	Signal	28.1	C	28.1	C	14.3	B	14.3	B
9	Gilman St. at Ninth St.	Signal	Signal	9.9	A	9.9	A	13.0	B	13.0	B
10	Gilman St. at 10th St.	TWSC [c]	TWSC [c]	>50.0	**F**	>50.0	**F**	>50.0	**F**	>50.0	**F**
11	Gilman St. at San Pablo Ave.	Signal	Signal	>50.0	**F**	>50.0	**F**	>50.0	**F**	>50.0	**F**
12	Eastshore Hwy. at Harrison St.	AWSC [d]	AWSC [d]	12.3	B	13.0	B	9.7	A	12.3	B
13	Second St. at Harrison St.	AWSC [d]	AWSC [d]	7.0	A	7.5	A	6.9	A	10.9	B

Source: TJKM, 2016
Notes:
[a.] Delay in seconds per vehicle. For Signalized and all-way stop controlled intersections, over-all (intersection) delay reported. For two-way-stop-control intersections, the worst approach are reported.
[b.] LOS - Level of Service.
[c.] TWSC - Two-way-stop-control. Delay and LOS of the worst approach are reported.
[d.] AWSC - All-way-stop-control.

Table 7: Intersection 95% Queue Length-2020 Conditions

ID	Intersection	Lane Group	Storage Length (ft) No Build(Build)	2020 No Build		2020 Build	
				AM	PM	AM	PM
1	Gilman St. at Frontage Rd.	EBLT	335	7	46	72	73
		EBR		10	0	-	-
		WBLT	55	82	64	n/a	n/a
		WBTR		17	0	n/a	n/a
		NBLTR	1215	61	256	29	1047
		SBLTR		36	39	-	-
2	Gilman St. at WB I-80 Ramps	EBT	55	24	98	n/a	n/a
		EBTR		17	84	n/a	n/a
		WBLT	190(230)	93	92	33	20
		WBT(L)	115	17	92	55	18
		SBL	600(675)	1277	463	353	53
		SBLTR	1156(1080)	1284	537	398	166
3	Gilman St. at EB I-80 Ramps	EBLT	190(270)	70	261	139	385
		EBT		0	0		
		WBT	50	10	26	n/a	n/a
		WBTR		35	35	n/a	n/a
		NBLT	700(1150)	50	41		
		NBTR		132	102	116	32
4	Gilman St. at Eastshore Hwy.	EBLT	50	41	48	n/a	n/a
		EBTR		27	7	n/a	n/a

ID	Intersection	Lane Group	Storage Length (ft) No Build(Build)	2020 No Build		2020 Build	
				AM	PM	AM	PM
		WBLT	130(183)	67	12	58	52
		WBTR	122	31	69	32	228
		NBLT	40(1000)	82	152	12	47
		NBTR		40	173	n/a	n/a
		SBLTR		177	172	96	42
5	Gilman St. at Second St.	EBLT	130	71	95	71	95
		WBLT	265	11	22	11	22
		WBTR		0	39	0	39
		NBLTR		29	57	29	57
6	Gilman St. at Fourth St.	EBLT	250	155	193	155	193
		EBR		71	40	71	40
		WBLT	260	249	258	249	258
		WBR	75	0	105	0	105
		NBLTR		55	74	55	74
		SBLTR		58	34	58	34
7	Gilman St. at Sixth St.	EBL	50	142	252	142	252
		EBTR	140	173	198	173	198
		WBL	80	127	95	127	95
		WBTR	245	297	290	297	290
		NBL	90	104	133	104	133
		NBTR		102	492	102	492

ID	Intersection	Lane Group	Storage Length (ft) No Build(Build)	2020 No Build		2020 Build	
				AM	PM	AM	PM
		SBL	65	38	20	38	20
		SBTR		173	83	173	83
8	Gilman St. at Eighth St.	EBL	50	54	35	54	35
		EBTR	260	92	114	92	114
		WBL	65	64	18	64	18
		WBTR	245	217	93	217	93
		NBLTR		38	152	38	152
		SBLTR		130	90	130	90
9	Gilman St. at Ninth St.	EBL	80	70	90	70	90
		EBTR	250	52	138	52	138
		WBL	75	93	63	93	63
		WBTR	260	242	192	242	192
		NBLTR		77	116	77	116
		SBL	90	44	63	44	63
		SBTR		81	79	81	79
10	Gilman St. at 10th St.	EBLT	260	44	86	44	86
		EBTR	50	38	38	38	38
		WBLT	265	96	91	96	91
		WBR	75	35	40	35	40
		NBLTR		65	96	65	96
		SBLTR		49	59	49	59

ID	Intersection	Lane Group	Storage Length (ft) No Build(Build)	2020 No Build		2020 Build	
				AM	PM	AM	PM
11	Gilman St. at San Pablo Ave.	EBLT	265	110	232	110	232
		EBTR		95	219	95	219
		WBLTR	200	400	547	400	547
		NBL	160	128	212	128	212
		NBT		137	452	137	452
		NBTR		88	386	88	386
		SBL	150	195	210	195	210
		SBT		417	369	417	369
		SBTR		397	345	397	345
12	Eastshore Hwy. at Harrison St.	WBLR	205	82	142	82	142
		NBTR		47	58	47	58
		SBLT		407	397	407	397
13	Second St. at Harrison St.	EBLT	205	21	18	21	18
		WBTR		0	0	0	0
		NBL		42	48	42	48
		NBTR	600	47	42	47	42
		SBLTR	540	40	41	40	41

Source: TJKM, 2016

Table 8: Intersection 95% Queue Length-2040 Conditions

ID	Intersection	Lane Group	Storage Length (ft) No Build(Build)	2040 No Build		2040 Build	
				AM	PM	AM	PM
1	Gilman St. at Frontage Rd.	EBLT	335	10	80	15	88
		EBR		0	51	-	-
		WBLT	55	64	86	n/a	n/a
		WBTR		10	0	n/a	n/a
		NBLTR	1215	164	264	95	1381
		SBLTR		23	49	-	-
2	Gilman St. at WB I-80 Ramps	EBT	55	46	58	n/a	n/a
		EBTR		35	85	n/a	n/a
		WBLT	190(230)	103	139	28	33
		WBT	115	10	0	60	6
		SBL	600(675)	3569	579	2608	70
		SBLTR	1156(1080)	3493	444	2209	264
3	Gilman St. at EB I-80 Ramps	EBLT	190(270)	86	93	106	407
		EBT		13	252	-	-
		WBT	50	21	25	n/a	n/a
		WBTR		37	21	n/a	n/a
		NBLT	700(1150)	48	340	-	-
		NBTR		159	469	99	79
4	Gilman St. at Eastshore Hwy.	EBLT	50	43	62	n/a	n/a
		EBTR		47	32	n/a	n/a
		WBLT	130(183)	93	149	55	43
		WBTR	122	6	239	26	197

ID	Intersection	Lane Group	Storage Length (ft) No Build(Build)	2040 No Build		2040 Build	
				AM	PM	AM	PM
		NBLT	40(1000)	68	144	12	53
		NBTR		46	179	-	-
		SBLTR		172	195	90	35
5	Gilman St. at Second St.	EBLT	130	56	115	56	115
		WBLT	265	15	344	15	344
		WBTR		0	119	0	119
		NBLTR		32	740	32	740
6	Gilman St. at Fourth St.	EBLT	250	127	591	127	591
		EBR		59	45	59	45
		WBLT	260	209	301	209	301
		WBR	75	9	0	9	0
		NBLTR		65	56	65	56
		SBLTR		46	27	46	27
7	Gilman St. at Sixth St.	EBL	50	97	354	97	354
		EBTR	140	164	218	164	218
		WBL	80	132	100	132	100
		WBTR	245	278	262	278	262
		NBL	90	114	117	114	117
		NBTR		84	584	84	584
		SBL	65	63	22	63	22
		SBTR		175	102	175	102
8	Gilman St. at Eighth St.	EBL	50	47	54	47	54
		EBTR	260	153	189	153	189

ID	Intersection	Lane Group	Storage Length (ft) No Build(Build)	2040 No Build		2040 Build	
				AM	PM	AM	PM
		WBL	65	70	15	70	15
		WBTR	245	257	87	257	87
		NBLTR		100	413	100	413
		SBLTR		542	215	542	215
9	Gilman St. at Ninth St.	EBL	80	66	110	66	110
		EBTR	250	82	281	82	281
		WBL	75	65	75	65	75
		WBTR	260	269	265	269	265
		NBLTR		70	204	70	204
		SBL	90	39	69	39	69
		SBTR		99	55	99	55
10	Gilman St. at 10th St.	EBLT	260	58	232	58	232
		EBTR	50	46	79	46	79
		WBLT	265	180	78	180	78
		WBR	75	10	27	10	27
		NBLTR		64	792	64	792
		SBLTR		67	87	67	87
11	Gilman St. at San Pablo Ave.	EBLT	265	169	304	169	304
		EBTR		172	305	172	305
		WBLTR	200	668	590	668	590
		NBL	160	141	231	141	231
		NBT		165	846	165	846
		NBTR		145	802	145	802

ID	Intersection	Lane Group	Storage Length (ft) No Build(Build)	2040 No Build		2040 Build	
				AM	PM	AM	PM
		SBL	150	218	227	218	227
		SBT		753	766	753	766
		SBTR		757	803	757	803
12	Eastshore Hwy. at Harrison St.	WBLR	205	232	266	232	266
		NBTR		45	73	45	73
		SBLT		335	413	335	413
13	Second St. at Harrison St.	EBLT	205	23	16	23	16
		WBTR		37	0	37	0
		NBL		77	107	77	107
		NBTR	600	49	38	49	38
		SBLTR	540	43	168	43	168

Source: TJKM, 2016

7.0. METERING AND SENSITIVITY ANALYSIS

Queueing between the east and west roundabouts in the PM peak hour:

A select link analysis from the Alameda County Transportation Commission Model was performed to understand the origin of the northbound West Frontage Road trips during the PM peak hour for the 2040 conditions. The analysis found that 45 % of the trips are from San Francisco, 14% of the trips are from northbound I-880, and 41% of the trips are from Emeryville. Due to the severe congestion on the eastbound I-80 during the PM peak, northbound West Frontage Road will be used as an alternative route to avoid I-80. This analysis indicates that about 60% of the traffic on northbound West Frontage Road is from I-880 and San Francisco and getting off I- 80 and using the West Frontage Road and Gilman Street to get back on to I-80 to avoid the congestion on I-80.

In Year 2020 and 2040 conditions, the eastbound queue from the east roundabout is expected to spill back towards the west roundabout during the PM peak hour. In 2020, the eastbound queue at the east roundabout is projected 385 feet exceeding the available storage of 270 feet by 115 feet or approximately 4 to 5 car lengths. In 2040, the eastbound queue at the east roundabout is projected 407 feet exceeding the available storage of 270 feet by 137 feet or approximately 5 to 6 car lengths. The traffic from the West Frontage Road represents about 40% of the traffic on eastbound Gilman Street at the east roundabout. As such, this queue is primarily due to the traffic from the NB west frontage road traffic avoiding EB I-80 traffic. Since this traffic yields to the circulating (from the wb off ramp, golden gate fields etc) traffic, if the queues from the east roundabout extended through this point, the NB west frontage vehicles will not enter the roundabout as they have to yield to the circulating (from the wb off ramp, golden gate fields etc) traffic. In reality though, it is likely that that drivers in the circulation lane (in other words within the roundabout) could stop and let the drivers at the yield line enter the roundabout in these types of one-on-one merge situations under this saturated condition.

To minimize the queue spillback, we recommend a meter at the NB approach along the West Frontage Road at the west roundabout to minimize the queue spill back from the east roundabout towards the west roundabout. A queue detector will be placed in the circulatory roadway of west roundabout at/near the westbound on-ramp. This queue detector will be tied to the meter on the West Frontage Road. The function of this queue detector will be to detect the queue and then trigger the meter on the West Frontage Road to prevent traffic from the West Frontage Road to enter the roundabout and minimize the spillback. The traffic from the West Frontage Road represents about 40% of the traffic on eastbound Gilman Street at the east roundabout. As such, metering this approach will minimize the queue spill back between the two roundabouts. With the metering, the eastbound PM queue at the east roundabout in 2020 and 2040 is projected to be 269 feet which is at the available storage. With the metering on northbound Frontage Road, the 2020 and 2040 delay on northbound West Frontage Road queue is expected to be three and half minutes and eight minutes, respectively. The 2040 and 2040 queue on northbound West Frontage Road is projected to be 2,381 feet and 3,586 feet, respectively. The above analysis represents a conservative worse case as it assumes the traffic (from I-880 and San Francisco) that is projected to use the frontage road continues to use the frontage even after the installation of the meters.

The basic concept of metering includes a metered approach) and a controlling approach, the approach that triggers the metering. The following types of metering techniques could be utilized:

- Based on queue detection: Under this technique, a queue detector will be placed on the eastbound departure leg (or the controlling approach) of the west roundabout approximately 250 feet from the yield line at the east roundabout. A two phased signal (yellow or flashing yellow and red) will be placed at the

metered northbound West Frontage Road approximately 50 to 80 feet from the yield line with a "stop here on red" sign. If a constant queue (approximately 5 seconds or as established by the D4 signal operations) is detected at the queue detector, this will trigger a red phase at the metered northbound West Frontage Road. The hardware that is required is similar to a simple signal system which includes and may not be limited to loops at the queue detector, conduit from the detector to the controller, controller cabinet, traffic signal and a new electric service point

- Constant meter (aka ramp meter): Under this technique, a two phased signal (yellow and red) will be placed at the metered northbound West Frontage Road approximately 50 to 80 feet from the yield line with a "stop here on red" sign. The signal will operate at a specific cycle with red phase and a yellow or flashing yellow phase. The hardware that is required is similar to a simple signal system which includes and may not be limited controller, controller cabinet, traffic signal and a new electric service point

The project team met with the City of Berkeley on 6/20/17 to discuss metering the West Frontage Road approach at the west roundabout. Based on the above information, the City concurred with the strategy to mitigate the queue between the east and west roundabout.

Queueing on the westbound off ramp during the 2040 AM peak hour Sensitivity Analysis

During the 2040 AM peak hour, the westbound off ramp at the west roundabout experiences excessive queuing. This is due to the traffic avoiding the freeway and using the frontage road. The westbound ramp operates acceptably during 2020. The queue will not impact operations until several years after the interchange improvements.

Under existing conditions, significant amount of traffic exits the freeway at Gilman Street off-ramp during the AM peak hour and use frontage road between Gilman Street and University Avenue to be ahead of the queue. This pattern is projected to continue and grow with increase in traffic demands along I 80 and as a result the queue jumping demand is projected to be higher than existing conditions. It should be noted that this analysis does not take into account the constrained demand in the future at the off-ramps at Gilman Street. It is likely that with the growth in traffic demands in the future, the projected demand (queue jump) at the interchange may not occur as the demand will be controlled by upstream bottlenecks and throughput along the corridor.

As currently proposed, at the west roundabout, one lane exits the off ramp and flares to entry lanes at the roundabout. The outside lane serves the traffic to Golden Gate Fields, Westbound Gilman Street and West Frontage Road. The inside lane serves the traffic to on ramp (queue jumping) and eastbound Gilman Street.

The traffic on the outside lane is expected to grow from 531 AM peak hour vehicles to 983 vehicles, an 85% increase. As noted previously, that this analysis does not take into account the constrained demand in the future at the off-ramps at Gilman Street that will be created by upstream bottlenecks and throughput along the corridor. As such, these expected growth levels may not be realized. A sensitivity analysis was conducted to establish how much growth can be accommodated before the queue spillback will occur to the mainline. The analysis indicated that an additional 50% growth over existing conditions (or 796 vehicles) can be accommodated on the outside lane without the queue spilling back on to the mainline. For these (50% growth) conditions, the queue in the outside lane is expected to be 1031 feet within the available storage of 1080 feet.

The traffic in the inside lane is expected to grow from 584 to 786 largely due to the queue jumping traffic (getting of the off ramp and back on to the on ramp). District 4 staff indicated that ramp meters were installed on the westbound on ramp which will discourage queue jumping. A sensitivity analysis was conducted without the queue jumping traffic. For these conditions, the queue in the inside lane is expected to be 281 feet within the available storage of 675 feet.

Traffic that exits the freeway at Gilman Street off-ramp during the AM peak hour and uses Frontage Road between Gilman Street and University Avenue to be ahead of the queue is not expected to exit the freeway if there is congestion on the off ramp which is visible from the freeway. Additionally, the projected growth may not be realized due to the upstream bottleneck at the interchange of I-80 and I-580 in the future conditions and the impact this will have on the throughput on I-80.. The roundabout as proposed can accommodate and provide acceptable operations for an additional 50% growth on the off ramp over existing conditions. As such, no additional improvements are necessary.

The project team met with the City of Berkeley on 6/20/17 to this approach for the westbound off ramp. The City concurred with the approach.

8.0. CONCLUSIONS

The decisive goal of the project is to simplify and improve navigation, mobility, reduce congestion, and improve safety at the I-80/Gilman Street interchange. The Traffic Operations Analysis Report (TOAR) examines both near term conditions in 2020 (opening year) and long-term conditions in 2040 (design year). The operation conditions

were analyzed using Synchro/Simtraffic tool for the No Build scenario by TJKM and using SIDRA, HCM 2010 Methodology and Parameters (CA Roundabout) for the Build scenario during the AM and PM peak hours.

The Roundabout Alternative is proposed as a Build alternative to meet the identified purpose and need of the project, while avoiding or minimizing environmental impacts. The Roundabout Alternative includes the reconfiguration of I-80 ramps and intersections at Gilman Street. The existing non-signalized intersection configuration with stop-controlled ramp terminuses would be replaced with two hybrid single-lane roundabouts with multilane portions on Gilman Street at the I-80 ramp terminals.

The future year analysis shows the following improvement in operations:

2020 Horizon Year

- The Gilman Street/Frontage Road and the Gilman Street/westbound I-80 ramps intersections level of service are projected to improve from LOS F to LOS C during the AM peak hour and LOS F to LOS D during the PM peak hour.
- The Gilman Street/eastbound I-80 ramps and Eastshore Highway intersection level of service is projected to improve from LOS D to LOS B during the AM peak hour and LOS F to LOS B during the PM peak hour.
- As discussed in the Metering section, a meter at the NB approach along the West Frontage Road at the west roundabout is recommended to minimize the queue spill back from the east roundabout towards the west roundabout

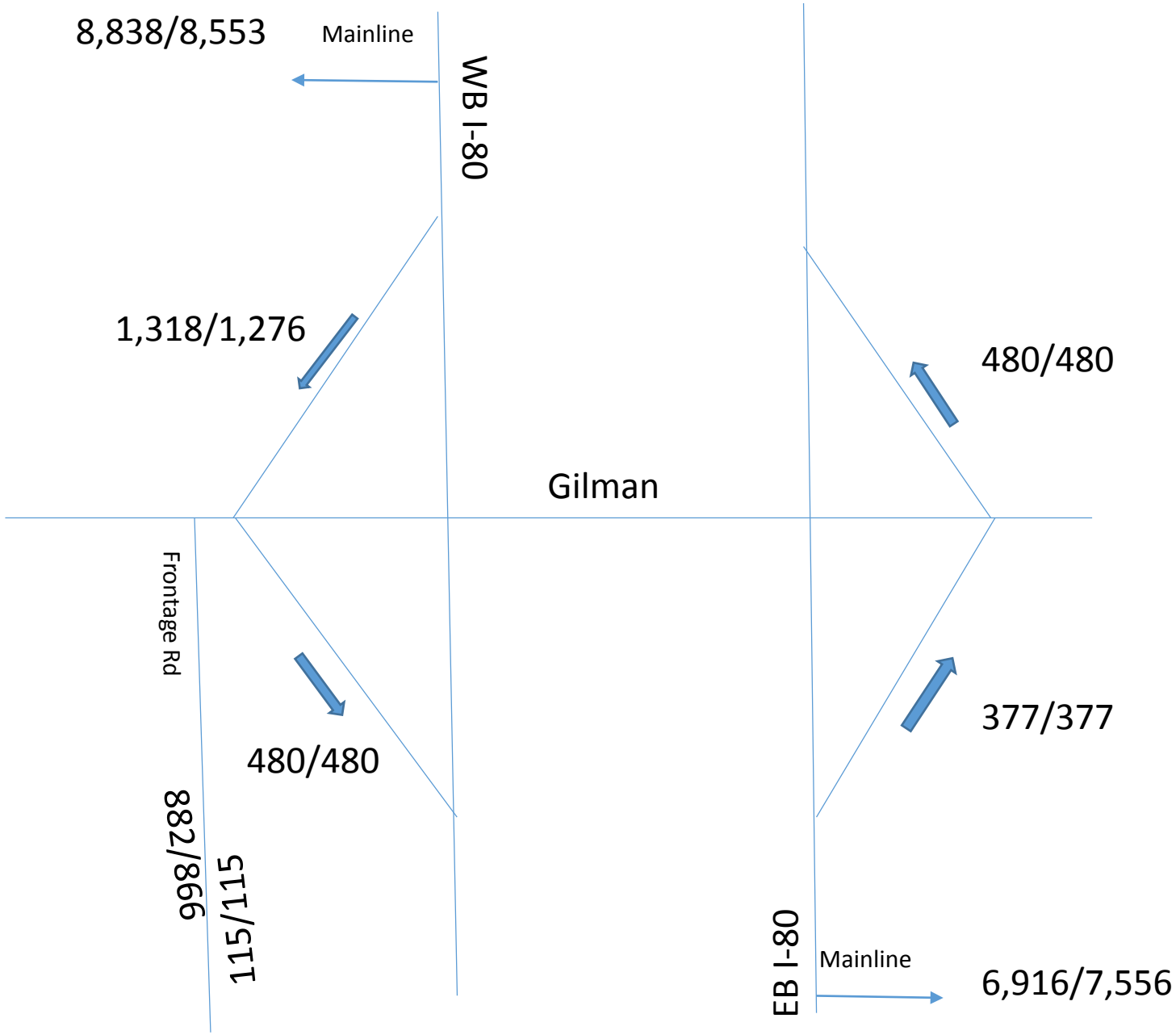
2040 Horizon Year

- The Gilman Street/Frontage Road and the Gilman Street/westbound I-80 ramps intersections level of service is projected to improve from LOS F to LOS E during the PM peak hour. The intersection is projected to continue to operate at LOS F during the AM peak hour, similar to No Build scenarios. The LOS F is due to the heavy queue jumping demand using the frontage road as an alternative to I 80 in the peak direction of travel in the AM peak hour. All other approaches are projected to operate at LOS C or better conditions.
- The Gilman Street/eastbound I-80 ramps and Eastshore Highway intersections are projected to operate at LOS A during AM peak hour and LOS B during the PM peak hour. It should be noted that the intersection of Gilman Street and Eastshore Highway is projected to operate at LOS F during both peak hours under No Build scenario.
- As discussed in the Metering section, a meter at the NB approach along the West Frontage Road at the west roundabout is recommended to minimize the queue spill back from the east roundabout towards the west roundabout

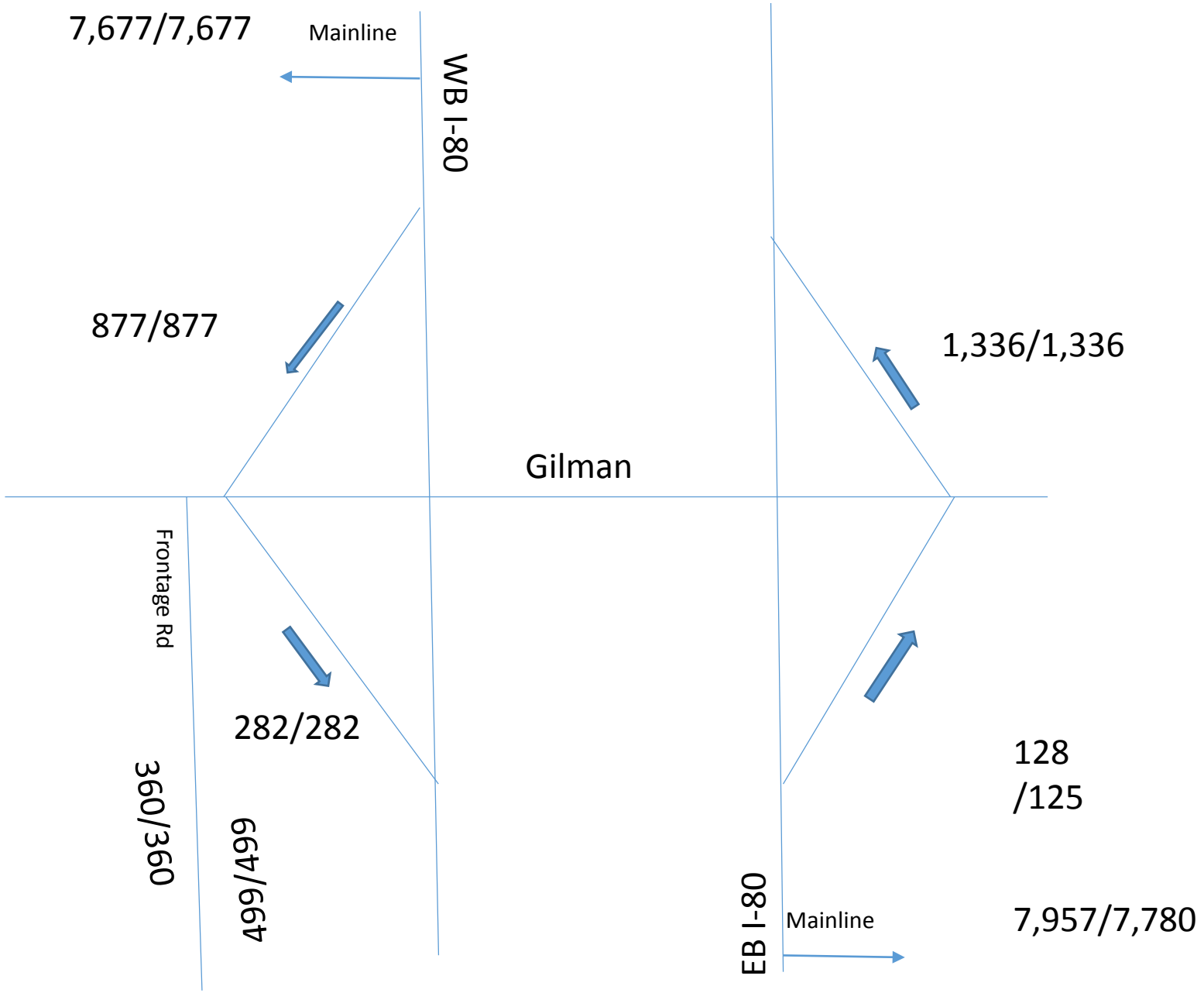
With the proposed project the average delay and queue lengths are projected to significantly reduced compared to No Build scenario. The intersection of Gilman Street and I 80 Westbound Ramp is projected to operate at LOS F with less delay compared to the No Build scenario under 2040 Conditions during the AM peak hour due to heavy queue jumping demand using the frontage road as an alternative to I 80 in the peak direction of travel. Under existing conditions, significant amount of traffic exits the freeway at Gilman Street off-ramp during the AM peak hour and use frontage road between Gilman Street and University Avenue to be ahead of the queue. This pattern is projected to continue and grow with increase in traffic demands along I 80 and as a result the queue jumping demand is projected to be higher than existing conditions. It should be noted that this analysis does not take into account the constrained demand in the future at the off-ramps at Gilman Street. It is likely that with the growth in traffic demands in the future, the projected demand (queue jump) at the interchange may not occur as the demand will be controlled by the upstream bottleneck at the interchange of I-80 and I-580 and the impact this will have on the throughput on I-80.

APPENDIX A

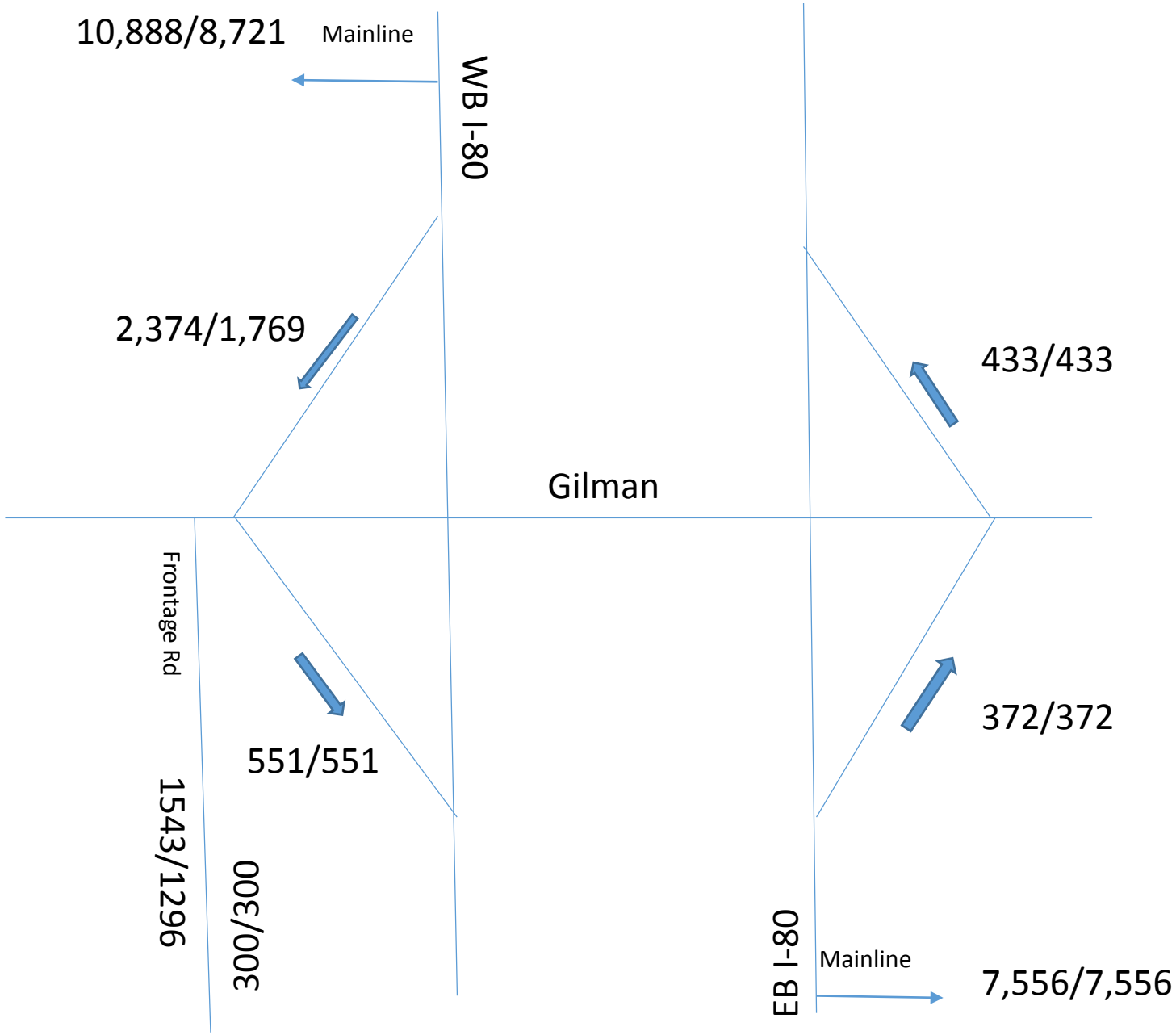
I-80 RAMP UNCONSTRAINED/CONSTRAINED DEMANDS



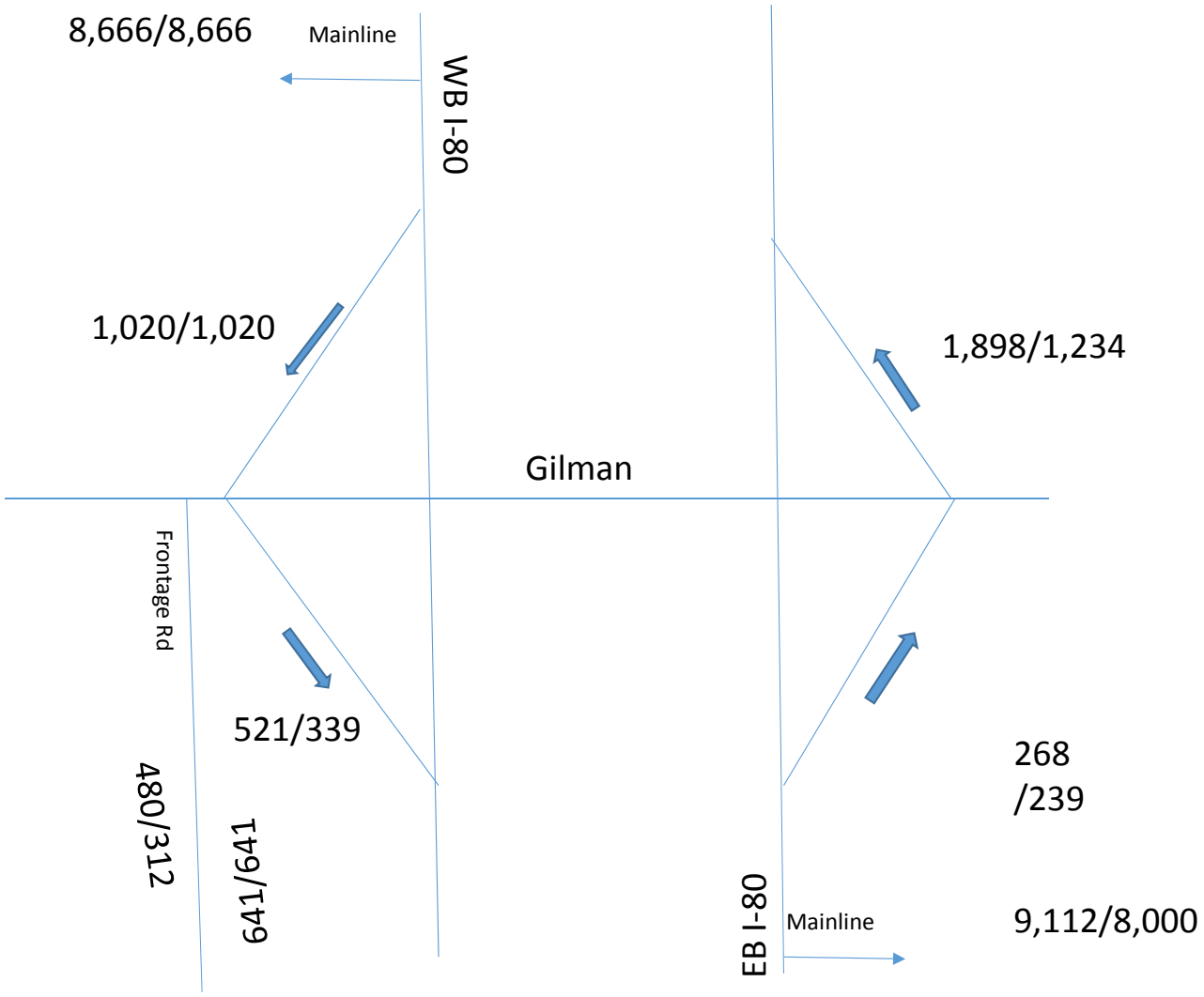
2020 AM Unconstrained/Constrained Volumes



2020 PM Unconstrained/Constrained Volumes



2040 AM Unconstrained/Constrained Volumes



2040 PM Unconstrained/Constrained Volumes

APPENDIX B

SYNCHRO OUTPUTS and SIDRA OUTPUTS

Existing Conditions

Existing Intersection Approach Level-of-Services

ID	Intersection	Control Type	Approach	AM Peak			PM Peak		
				Delay [a]	LOS [b]	V/C[e]	Delay [a]	LOS [b]	V/C
1	Gilman St. at Frontage Rd.	TWSC [c]	Eastbound	0.4	A	0.01	0.0	A	0.01
			Westbound	9.4	B	0.59	6.0	A	0.26
			Northbound	>50.0	**F**	0.54	20.3	C	0.69
			Southbound	>50.0	**F**	0.71	>50.0	**F**	0.53
2	Gilman St. at WB I-80 Ramps	TWSC [c]	Eastbound	0	A	0.04	0	A	0.27
			Westbound	3.7	A	0.23	6.2	A	0.25
			Southbound	>50.0	**F**	3.49	>50.0	**F**	1.83
3	Gilman St. at EB I-80 Ramps	TWSC [c]	Eastbound	1.3	A	0.25	37.6	C	0.97
			Westbound	0	A	0.38	0	A	0.62
			Northbound	18.9	C	0.56	>50.0	**F**	9.86
4	Gilman St. at Eastshore Hwy.	TWSC [c]	Eastbound	0.4	A	0.37	2.0	A	0.23
			Westbound	0.2	A	0.24	0.0	A	0.36
			Northbound	>50.0	**F**	n/a	>50.0	**F**	2.97
			Southbound	>50.0	**F**	3.06	>50.0	**F**	1.51
5	Gilman St. at Second St.	TWSC [c]	Eastbound	1.0	A	0.04	1.3	A	0.05
			Westbound	0.1	A	0.26	0.0	A	0.34
			Northbound	26.8	D	0.08	41.1	**E**	0.21
6	Gilman St. at 4th St.	TWSC [c]	Eastbound	0.6	A	0.05	1.2	A	0.04
			Westbound	0.8	A	0.03	1.0	A	0.03
			Northbound	74.2	**F**	0.54	>50.0	**F**	3.4
			Southbound	19.5	C	0.08	>50.0	**F**	0.21
7	Gilman St. at 6th St.	Signal	Eastbound	9.6	A	0.52	19.6	B	0.65
			Westbound	14.4	B	0.57	18.7	B	0.75
			Northbound	23.9	C	0.62	33.4	C	0.92
			Southbound	22.7	C	0.56	14.0	B	0.15
8	Gilman St. at 8th St.	Signal	Eastbound	6.1	A	0.4	4.4	A	0.45
			Westbound	7.5	A	0.61	4.9	A	0.56
			Northbound	19.0	B	0.05	26.4	C	0.26
			Southbound	20.5	C	0.19	25.3	C	0.18

ID	Intersection	Control Type	Approach	AM Peak			PM Peak		
				Delay [a]	LOS [b]	V/C[e]	Delay [a]	LOS [b]	V/C
9	Gilman St. at 9th St.	Signal	Eastbound	1.9	A	0.34	5.1	A	0.41
			Westbound	10.3	B	0.6	8.2	A	0.51
			Northbound	19.8	B	0.12	25.6	C	0.19
			Southbound	19.6	B	0.11	24.9	C	0.18
10	Gilman St. at 10th St.	TWSC [c]	Eastbound	0.6	A	0.14	0.5	A	0.18
			Westbound	0.6	A	0.02	0.3	A	0.02
			Northbound	26.3	D	0.3	49.8	E	0.6
			Southbound	27.7	D	0.3	33.2	D	0.42
11	Gilman St. at San Pablo Ave.	Signal	Eastbound	21.3	C	0.41	47.7	D	0.92
			Westbound	46.6	D	0.92	48.6	D	0.9
			Northbound	22.4	C	0.7	29.9	C	0.76
			Southbound	32.2	C	0.9	30.1	C	0.74
12	Eastshore Hwy. at Harrison St.	AWSC [d]	Westbound	8.7	A	0.1	7.6	A	0.07
			Northbound	7.9	A	0.08	8.5	A	0.24
			Southbound	12.3	B	0.61	7.9	A	0.13
13	Second St. at Harrison St.	AWSC [d]	Eastbound	7.4	A	0.02	7.3	A	0.005
			Westbound	7.2	A	0.01	0.0	A	0
			Northbound	6.9	A	0.05	6.8	A	0.04
			Southbound	6.6	A	0.02	6.6	A	0.02

Source: TJKM, 2016

Notes:

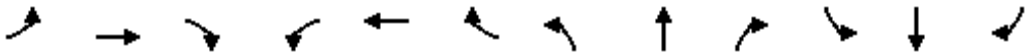
a. Delay in seconds per vehicle. For Signalized and all-way-stop controlled intersections, overall (intersection) delay reported. For two-way stop-control intersections, the worst approach is reported.

b. LOS-Level of Service.

c. TWSC-Two-way-stop-control. Delay and LOS of the worst approach are reported.

d. AWSC-All-way-stop-control.

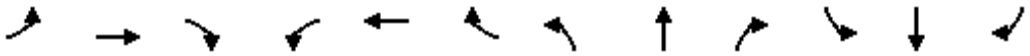
d. If an approach has more than one lane group, the worse lane group v/c was reported.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	33	12	839	124	18	8	0	57	8	3	5
Future Volume (Veh/h)	3	33	12	839	124	18	8	0	57	8	3	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	36	13	912	135	20	9	0	62	9	3	5
Pedestrians		7									1	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		3.5									3.5	
Percent Blockage		1									0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	156			49			1947	2022	36	2074	2025	86
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	156			49			1947	2022	36	2074	2025	86
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			41			52	100	94	42	87	99
cM capacity (veh/h)	1420			1556			19	24	1029	16	24	949

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	39	13	980	88	71	17
Volume Left	3	0	912	0	9	9
Volume Right	0	13	0	20	62	5
cSH	1420	1700	1556	1700	131	24
Volume to Capacity	0.00	0.01	0.59	0.05	0.54	0.71
Queue Length 95th (ft)	0	0	101	0	66	53
Control Delay (s)	0.6	0.0	10.3	0.0	61.2	320.7
Lane LOS	A		B		F	F
Approach Delay (s)	0.4		9.4		61.2	320.7
Approach LOS					F	F

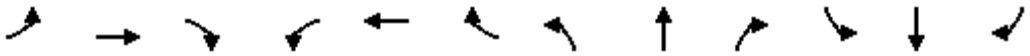
Intersection Summary				
Average Delay	16.5			
Intersection Capacity Utilization	65.2%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	86	12	313	450	0	0	0	0	543	41	531
Future Volume (Veh/h)	0	86	12	313	450	0	0	0	0	543	41	531
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	93	13	340	489	0	0	0	0	590	45	577
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	489			106			1624	1268	53	1216	1275	244
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	489			106			1624	1268	53	1216	1275	244
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			77			100	100	100	0	65	24
cM capacity (veh/h)	1070			1483			10	129	1003	113	128	756

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	62	44	503	326	393	819
Volume Left	0	0	340	0	393	197
Volume Right	0	13	0	0	0	577
cSH	1700	1700	1483	1700	113	286
Volume to Capacity	0.04	0.03	0.23	0.19	3.49	2.86
Queue Length 95th (ft)	0	0	22	0	Err	1772
Control Delay (s)	0.0	0.0	6.2	0.0	Err	872.7
Lane LOS			A		F	F
Approach Delay (s)	0.0		3.7		3834.5	
Approach LOS					F	

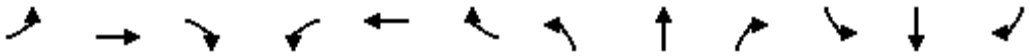
Intersection Summary				
Average Delay	2166.1			
Intersection Capacity Utilization	63.9%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	578	0	0	733	351	30	0	342	0	0	0
Future Volume (Veh/h)	51	578	0	0	733	351	30	0	342	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	628	0	0	797	382	33	0	372	0	0	0
Pedestrians								12			9	
Lane Width (ft)								12.0			0.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1188			640			1148	1938	326	1793	1747	598
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1188			640			1148	1938	326	1793	1747	598
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91			100			76	100	44	100	100	100
cM capacity (veh/h)	583			929			140	58	662	20	76	445

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	264	419	531	648	33	372
Volume Left	55	0	0	0	33	0
Volume Right	0	0	0	382	0	372
cSH	583	1700	1700	1700	140	662
Volume to Capacity	0.09	0.25	0.31	0.38	0.24	0.56
Queue Length 95th (ft)	8	0	0	0	22	88
Control Delay (s)	3.5	0.0	0.0	0.0	38.6	17.2
Lane LOS	A				E	C
Approach Delay (s)	1.3		0.0		18.9	
Approach LOS					C	

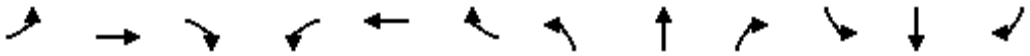
Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	71.2%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	621	272	10	711	24	38	2	24	48	126	335
Future Volume (Veh/h)	27	621	272	10	711	24	38	2	24	48	126	335
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	675	296	11	773	26	41	2	26	52	137	364
Pedestrians					1			8			6	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					3.5			3.5			3.5	
Percent Blockage					0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	805			979			1730	1716	494	1238	1851	406
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	805			979			1730	1716	494	1238	1851	406
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			98			0	98	95	55	0	38
cM capacity (veh/h)	811			695			0	83	516	116	69	591

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	366	634	398	412	42	27	553
Volume Left	29	0	11	0	41	0	52
Volume Right	0	296	0	26	0	26	364
cSH	811	1700	695	1700	0	433	181
Volume to Capacity	0.04	0.37	0.02	0.24	Err	0.06	3.06
Queue Length 95th (ft)	3	0	1	0	Err	5	Err
Control Delay (s)	1.2	0.0	0.5	0.0	Err	13.9	Err
Lane LOS	A		A		F	B	F
Approach Delay (s)	0.4		0.2		Err		Err
Approach LOS					F		F

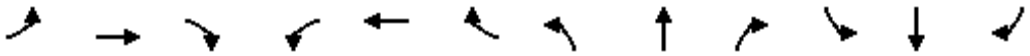
Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	89.7%	ICU Level of Service	E	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	638	26	6	736	33	9	0	5	0	0	0
Future Volume (Veh/h)	29	638	26	6	736	33	9	0	5	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	693	28	7	800	36	10	0	5	0	0	0
Pedestrians								1			4	
Lane Width (ft)								12.0			0.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	840			722			1172	1612	694	1598	1622	422
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	840			722			1172	1612	694	1598	1622	422
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			99			93	100	99	100	100	100
cM capacity (veh/h)	791			875			142	98	385	68	97	580

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	725	28	407	436	15
Volume Left	32	0	7	0	10
Volume Right	0	28	0	36	5
cSH	791	1700	875	1700	180
Volume to Capacity	0.04	0.02	0.01	0.26	0.08
Queue Length 95th (ft)	3	0	1	0	7
Control Delay (s)	1.1	0.0	0.3	0.0	26.8
Lane LOS	A		A		D
Approach Delay (s)	1.0		0.1		26.8
Approach LOS					D

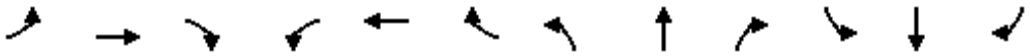
Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	544	82	26	724	3	32	0	20	2	0	19
Future Volume (Veh/h)	17	544	82	26	724	3	32	0	20	2	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	591	89	28	787	3	35	0	22	2	0	21
Pedestrians					8			10			17	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					3.5			3.5			3.5	
Percent Blockage					1			1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					639							
pX, platoon unblocked	0.80						0.80	0.80		0.80	0.80	0.80
vC, conflicting volume	807			690			1501	1500	609	1517	1586	804
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	632			690			1501	1500	609	1521	1608	628
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			50	100	95	97	100	94
cM capacity (veh/h)	747			896			70	90	487	68	77	379

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	609	89	815	3	57	23
Volume Left	18	0	28	0	35	2
Volume Right	0	89	0	3	22	21
cSH	747	1700	896	1700	105	271
Volume to Capacity	0.02	0.05	0.03	0.00	0.54	0.08
Queue Length 95th (ft)	2	0	2	0	63	7
Control Delay (s)	0.7	0.0	0.8	0.0	74.2	19.5
Lane LOS	A		A		F	C
Approach Delay (s)	0.6		0.8		74.2	19.5
Approach LOS					F	C

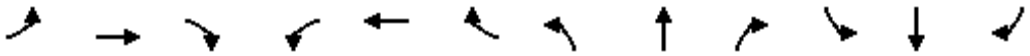
Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	76.6%	ICU Level of Service		D
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	431	99	77	552	30	119	33	43	15	197	76
Future Volume (vph)	22	431	99	77	552	30	119	33	43	15	197	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.92		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1749	1802		1767	1842		1748	1675		1761	1761	
Flt Permitted	0.31	1.00		0.35	1.00		0.40	1.00		0.70	1.00	
Satd. Flow (perm)	578	1802		655	1842		744	1675		1303	1761	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	468	108	84	600	33	129	36	47	16	214	83
RTOR Reduction (vph)	0	12	0	0	3	0	0	34	0	0	19	0
Lane Group Flow (vph)	24	564	0	84	630	0	129	49	0	16	278	0
Confl. Peds. (#/hr)	21		2	2		21	12		3	3		12
Confl. Bikes (#/hr)			2			8			4			4
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	42.3	42.3		42.3	42.3		19.7	19.7		19.7	19.7	
Effective Green, g (s)	42.3	42.3		42.3	42.3		19.7	19.7		19.7	19.7	
Actuated g/C Ratio	0.60	0.60		0.60	0.60		0.28	0.28		0.28	0.28	
Clearance Time (s)	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	
Lane Grp Cap (vph)	349	1088		395	1113		209	471		366	495	
v/s Ratio Prot		0.31			c0.34			0.03			0.16	
v/s Ratio Perm	0.04			0.13			c0.17			0.01		
v/c Ratio	0.07	0.52		0.21	0.57		0.62	0.10		0.04	0.56	
Uniform Delay, d1	5.7	8.0		6.3	8.3		21.9	18.6		18.3	21.5	
Progression Factor	1.00	1.00		1.49	1.58		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	1.8		1.0	1.8		5.3	0.1		0.0	1.5	
Delay (s)	6.1	9.7		10.4	14.9		27.2	18.7		18.3	22.9	
Level of Service	A	A		B	B		C	B		B	C	
Approach Delay (s)		9.6			14.4			23.9			22.7	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
Analysis Period (min)	15		

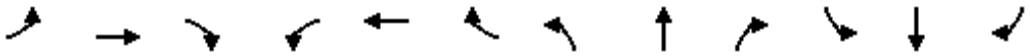
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	387	33	23	615	25	7	9	9	14	56	30
Future Volume (vph)	32	387	33	23	615	25	7	9	9	14	56	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.98			0.99	
Flpb, ped/bikes	0.99	1.00		0.99	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.95			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1747	1835		1758	1846			1714			1745	
Flt Permitted	0.28	1.00		0.44	1.00			0.94			0.97	
Satd. Flow (perm)	514	1835		813	1846			1634			1706	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	421	36	25	668	27	8	10	10	15	61	33
RTOR Reduction (vph)	0	4	0	0	2	0	0	7	0	0	23	0
Lane Group Flow (vph)	35	453	0	25	693	0	0	21	0	0	86	0
Confl. Peds. (#/hr)	28		8	8		28	7		11	11		7
Confl. Bikes (#/hr)			4			8			5			10
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	43.0	43.0		43.0	43.0			19.0			19.0	
Effective Green, g (s)	43.0	43.0		43.0	43.0			19.0			19.0	
Actuated g/C Ratio	0.61	0.61		0.61	0.61			0.27			0.27	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	315	1127		499	1133			443			463	
v/s Ratio Prot		0.25			c0.38							
v/s Ratio Perm	0.07			0.03				0.01			c0.05	
v/c Ratio	0.11	0.40		0.05	0.61			0.05			0.19	
Uniform Delay, d1	5.6	6.9		5.4	8.3			18.8			19.6	
Progression Factor	0.62	0.77		0.86	0.66			1.00			1.00	
Incremental Delay, d2	0.6	1.0		0.2	2.1			0.2			0.9	
Delay (s)	4.1	6.3		4.8	7.6			19.0			20.5	
Level of Service	A	A		A	A			B			C	
Approach Delay (s)		6.1			7.5			19.0			20.5	
Approach LOS		A			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

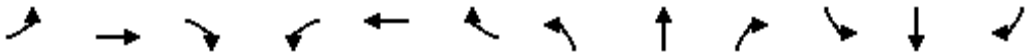
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	318	33	46	581	41	25	16	23	21	30	57
Future Volume (vph)	59	318	33	46	581	41	25	16	23	21	30	57
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	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99			0.97		1.00	0.97	
Flpb, ped/bikes	0.98	1.00		0.99	1.00			1.00		0.96	1.00	
Frt	1.00	0.99		1.00	0.99			0.95		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1743	1829		1752	1834			1683		1705	1637	
Flt Permitted	0.29	1.00		0.49	1.00			0.89		0.78	1.00	
Satd. Flow (perm)	534	1829		912	1834			1527		1407	1637	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	346	36	50	632	45	27	17	25	23	33	62
RTOR Reduction (vph)	0	5	0	0	3	0	0	18	0	0	45	0
Lane Group Flow (vph)	64	377	0	50	674	0	0	51	0	23	50	0
Confl. Peds. (#/hr)	31		10	10		31	7		22	22		7
Confl. Bikes (#/hr)			6			8			12			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	43.0	43.0		43.0	43.0			19.0		19.0	19.0	
Effective Green, g (s)	43.0	43.0		43.0	43.0			19.0		19.0	19.0	
Actuated g/C Ratio	0.61	0.61		0.61	0.61			0.27		0.27	0.27	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	328	1123		560	1126			414		381	444	
v/s Ratio Prot		0.21			c0.37						0.03	
v/s Ratio Perm	0.12			0.05				c0.03		0.02		
v/c Ratio	0.20	0.34		0.09	0.60			0.12		0.06	0.11	
Uniform Delay, d1	5.9	6.6		5.5	8.2			19.2		18.9	19.2	
Progression Factor	0.19	0.17		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	1.2	0.8		0.3	2.3			0.6		0.3	0.5	
Delay (s)	2.4	1.8		5.8	10.6			19.8		19.2	19.7	
Level of Service	A	A		A	B			B		B	B	
Approach Delay (s)		1.9			10.3			19.8			19.6	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		

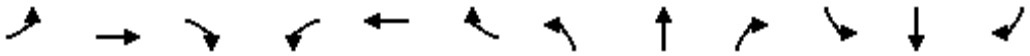
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	258	84	25	621	33	23	6	36	29	8	24
Future Volume (Veh/h)	20	258	84	25	621	33	23	6	36	29	8	24
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	280	91	27	675	36	25	7	39	32	9	26
Pedestrians		6			15			4			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		315			340							
pX, platoon unblocked	0.75						0.75	0.75		0.75	0.75	0.75
vC, conflicting volume	719			375			1139	1146	204	978	1156	689
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	464			375			1021	1031	204	808	1044	424
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			98			80	96	95	82	94	94
cM capacity (veh/h)	818			1176			122	164	788	176	161	430

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	162	231	702	36	71	67
Volume Left	22	0	27	0	25	32
Volume Right	0	91	0	36	39	26
cSH	818	1700	1176	1700	239	225
Volume to Capacity	0.03	0.14	0.02	0.02	0.30	0.30
Queue Length 95th (ft)	2	0	2	0	30	30
Control Delay (s)	1.5	0.0	0.6	0.0	26.3	27.7
Lane LOS	A		A		D	D
Approach Delay (s)	0.6		0.6		26.3	27.7
Approach LOS					D	D

Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	63.3%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	180	81	46	404	20	114	361	17	76	1019	161
Future Volume (vph)	62	180	81	46	404	20	114	361	17	76	1019	161
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	4.5		4.0	4.5	
Lane Util. Factor		0.95			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.99		1.00	0.99		1.00	0.98	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3357			1839		1770	3511		1770	3435	
Flt Permitted		0.69			0.93		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2343			1715		1770	3511		1770	3435	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	196	88	50	439	22	124	392	18	83	1108	175
RTOR Reduction (vph)	0	42	0	0	2	0	0	3	0	0	14	0
Lane Group Flow (vph)	0	309	0	0	509	0	124	407	0	83	1269	0
Confl. Peds. (#/hr)			6	6		25	20		13	13		20
Confl. Bikes (#/hr)			4			11			1			5
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		25.8			25.8		8.0	33.6		7.1	32.7	
Effective Green, g (s)		25.8			25.8		8.0	33.6		7.1	32.7	
Actuated g/C Ratio		0.32			0.32		0.10	0.42		0.09	0.41	
Clearance Time (s)		5.0			5.0		4.0	4.5		4.0	4.5	
Vehicle Extension (s)		2.0			2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		755			553		177	1474		157	1404	
v/s Ratio Prot							c0.07	0.12		0.05	c0.37	
v/s Ratio Perm		0.13			c0.30							
v/c Ratio		0.41			0.92		0.70	0.28		0.53	0.90	
Uniform Delay, d1		21.2			26.1		34.8	15.2		34.9	22.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			20.5		9.8	0.5		1.5	9.8	
Delay (s)		21.3			46.6		44.6	15.7		36.3	32.0	
Level of Service		C			D		D	B		D	C	
Approach Delay (s)		21.3			46.6			22.4			32.2	
Approach LOS		C			D			C			C	

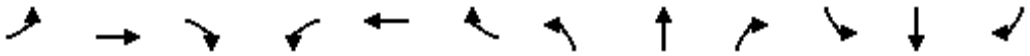
Intersection Summary			
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	44	11	50	3	11	465
Future Volume (vph)	44	11	50	3	11	465
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	12	54	3	12	505

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	60	57	517
Volume Left (vph)	48	0	12
Volume Right (vph)	12	3	0
Hadj (s)	0.07	0.00	0.04
Departure Headway (s)	5.2	4.6	4.2
Degree Utilization, x	0.09	0.07	0.60
Capacity (veh/h)	618	750	846
Control Delay (s)	8.7	7.9	13.2
Approach Delay (s)	8.7	7.9	13.2
Approach LOS	A	A	B

Intersection Summary			
Delay	12.3		
Level of Service	B		
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	14	0	0	0	10	1	31	30	1	0	0	14
Future Volume (vph)	14	0	0	0	10	1	31	30	1	0	0	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	0	0	0	11	1	34	33	1	0	0	15

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	15	12	34	34	15
Volume Left (vph)	15	0	34	0	0
Volume Right (vph)	0	1	0	1	15
Hadj (s)	0.23	-0.02	0.53	0.01	-0.57
Departure Headway (s)	4.3	4.1	5.1	4.6	3.6
Degree Utilization, x	0.02	0.01	0.05	0.04	0.01
Capacity (veh/h)	809	858	692	770	994
Control Delay (s)	7.4	7.2	7.2	6.6	6.6
Approach Delay (s)	7.4	7.2	6.9		6.6
Approach LOS	A	A	A		A

Intersection Summary				
Delay	6.9			
Level of Service	A			
Intersection Capacity Utilization	23.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection: 1: Frontage Rd & Gilman St

Movement	WB	WB	NB	SB
Directions Served	LT	TR	LTR	LTR
Maximum Queue (ft)	72	31	56	53
Average Queue (ft)	30	1	32	13
95th Queue (ft)	67	10	48	39
Link Distance (ft)	60	60	215	224
Upstream Blk Time (%)	1			
Queuing Penalty (veh)	3			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Gilman St & WB I-80 Ramps

Movement	EB	EB	WB	SB	SB	B48
Directions Served	T	TR	LT	L	LTR	T
Maximum Queue (ft)	27	29	76	539	592	498
Average Queue (ft)	5	1	21	382	543	439
95th Queue (ft)	21	10	55	640	592	585
Link Distance (ft)	60	60	195	472	472	435
Upstream Blk Time (%)				1	90	87
Queuing Penalty (veh)				0	0	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: EB I-80 Ramps & Gilman St

Movement	EB	WB	WB	NB	NB
Directions Served	LT	T	TR	LT	TR
Maximum Queue (ft)	74	31	92	89	204
Average Queue (ft)	22	4	8	25	78
95th Queue (ft)	64	21	41	57	142
Link Distance (ft)	195	14	14	356	356
Upstream Blk Time (%)		0	0		
Queuing Penalty (veh)		1	1		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: Eastshore Hwy & Gilman St

Movement	EB	EB	WB	WB	B43	NB	NB	SB	B40	B36
Directions Served	LT	TR	LT	TR	T	LT	TR	LTR	T	T
Maximum Queue (ft)	54	51	185	46	35	111	30	192	181	346
Average Queue (ft)	25	7	20	4	1	30	16	158	144	320
95th Queue (ft)	46	31	87	23	11	67	40	172	178	439
Link Distance (ft)	14	14	113	113	12	130	130	85	72	331
Upstream Blk Time (%)	3	1	0		0	0		99	96	49
Queuing Penalty (veh)	15	2	2		0	0		504	488	247
Storage Bay Dist (ft)										
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 5: Second St & Gilman St

Movement	EB	WB	NB
Directions Served	LT	LT	LTR
Maximum Queue (ft)	50	130	42
Average Queue (ft)	11	11	11
95th Queue (ft)	36	59	33
Link Distance (ft)	12	616	621
Upstream Blk Time (%)	1		
Queuing Penalty (veh)	5		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: 4th St & Gilman St

Movement	EB	WB	NB	SB
Directions Served	LT	LT	LTR	LTR
Maximum Queue (ft)	54	116	65	31
Average Queue (ft)	11	31	20	10
95th Queue (ft)	39	82	45	33
Link Distance (ft)	616	260	568	627
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)	0	1		
Queuing Penalty (veh)	0	0		

Intersection: 7: 6th St & Gilman St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	177	162	104	294	114	220	90	223
Average Queue (ft)	18	102	55	219	74	52	12	109
95th Queue (ft)	74	162	117	316	121	142	51	185
Link Distance (ft)	259			275		636		585
Upstream Blk Time (%)				3				
Queuing Penalty (veh)				20				
Storage Bay Dist (ft)		140	80		90		65	
Storage Blk Time (%)		3	1	27	15	0		21
Queuing Penalty (veh)		1	4	21	11	0		3

Intersection: 8: 8th St & Gilman St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	LTR	LTR
Maximum Queue (ft)	55	96	89	228	51	161
Average Queue (ft)	9	44	15	119	15	53
95th Queue (ft)	35	90	65	198	43	103
Link Distance (ft)		235		289	638	424
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	50		65			
Storage Blk Time (%)	1	4		16		
Queuing Penalty (veh)	5	1		4		

Intersection: 9: 9th St & Gilman St

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	L	TR
Maximum Queue (ft)	70	53	100	253	75	50	74
Average Queue (ft)	30	15	32	145	34	11	37
95th Queue (ft)	64	45	88	248	63	38	70
Link Distance (ft)		289		253	599		398
Upstream Blk Time (%)				0			
Queuing Penalty (veh)				1			
Storage Bay Dist (ft)	80		75			90	
Storage Blk Time (%)	0		1	16			0
Queuing Penalty (veh)	0		4	8			0

Intersection: 10: 10th St & Gilman St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	R	LTR	LTR
Maximum Queue (ft)	104	75	226	50	96	70
Average Queue (ft)	12	11	50	3	44	30
95th Queue (ft)	52	49	155	20	75	58
Link Distance (ft)	253		265		656	393
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		50		75		
Storage Blk Time (%)	0	0	2			
Queuing Penalty (veh)	1	0	1			

Intersection: 11: San Pablo Ave & Gilman St

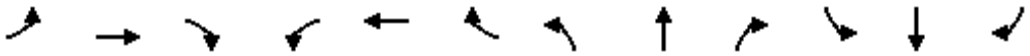
Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	116	114	413	152	137	135	174	309	301
Average Queue (ft)	67	70	217	73	82	44	79	204	191
95th Queue (ft)	114	106	348	124	122	95	161	278	289
Link Distance (ft)	265	265	515		833	833		698	698
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)				160			150		
Storage Blk Time (%)				0			0	18	
Queuing Penalty (veh)				0			0	14	

Intersection: 12: Harrison St & Eastshore Hwy

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	72	50	347
Average Queue (ft)	34	29	282
95th Queue (ft)	64	45	410
Link Distance (ft)	196	331	295
Upstream Blk Time (%)			81
Queuing Penalty (veh)			0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: Harrison St & Second St

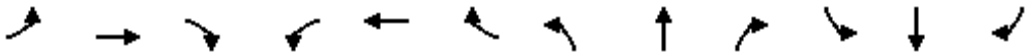
Movement	EB	WB	NB	NB	SB
Directions Served	LT	TR	L	TR	LTR
Maximum Queue (ft)	24	30	31	54	30
Average Queue (ft)	8	10	18	21	10
95th Queue (ft)	26	33	42	49	32
Link Distance (ft)	196	91	98	98	149
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	181	21	315	144	20	12	0	452	11	4	4
Future Volume (Veh/h)	1	181	21	315	144	20	12	0	452	11	4	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	197	23	342	157	22	13	0	491	12	4	4
Pedestrians		2						4			4	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		3.5						3.5			3.5	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	183			224			974	1070	201	1546	1082	96
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	183			224			974	1070	201	1546	1082	96
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			74			92	100	39	50	97	100
cM capacity (veh/h)	1384			1337			160	162	803	24	159	937

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	198	23	420	100	504	20
Volume Left	1	0	342	0	13	12
Volume Right	0	23	0	22	491	4
cSH	1384	1700	1337	1700	728	38
Volume to Capacity	0.00	0.01	0.26	0.06	0.69	0.53
Queue Length 95th (ft)	0	0	26	0	141	46
Control Delay (s)	0.0	0.0	7.4	0.0	20.3	178.1
Lane LOS	A		A		C	F
Approach Delay (s)	0.0		6.0		20.3	178.1
Approach LOS					C	F

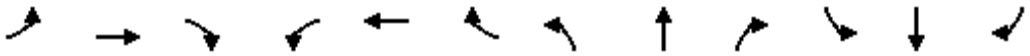
Intersection Summary			
Average Delay	13.4		
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	629	15	203	159	0	0	0	0	414	4	320
Future Volume (Veh/h)	0	629	15	203	159	0	0	0	0	414	4	320
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	684	16	221	173	0	0	0	0	450	4	348
Pedestrians											14	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	187			700			1570	1321	350	971	1329	100
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	187			700			1570	1321	350	971	1329	100
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			75			100	100	100	0	96	62
cM capacity (veh/h)	1366			893			36	115	646	164	114	923

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	456	244	279	115	300	502
Volume Left	0	0	221	0	300	150
Volume Right	0	16	0	0	0	348
cSH	1700	1700	893	1700	164	378
Volume to Capacity	0.27	0.14	0.25	0.07	1.83	1.33
Queue Length 95th (ft)	0	0	24	0	553	587
Control Delay (s)	0.0	0.0	8.8	0.0	444.4	193.7
Lane LOS			A		F	F
Approach Delay (s)	0.0		6.2		287.5	
Approach LOS					F	

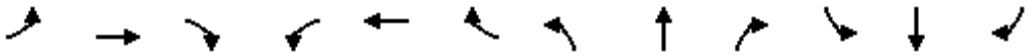
Intersection Summary				
Average Delay	122.9			
Intersection Capacity Utilization	61.3%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	462	581	0	0	350	847	12	6	110	0	0	0
Future Volume (Veh/h)	462	581	0	0	350	847	12	6	110	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	502	632	0	0	380	921	13	7	120	0	0	0
Pedestrians								12			19	
Lane Width (ft)								12.0			0.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1320			644			1838	2968	328	2303	2508	670
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1320			644			1838	2968	328	2303	2508	670
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	3			100			0	0	82	0	100	100
cM capacity (veh/h)	519			926			6	0	660	0	1	400

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	713	421	253	1048	16	124
Volume Left	502	0	0	0	13	0
Volume Right	0	0	0	921	0	120
cSH	519	1700	1700	1700	2	16
Volume to Capacity	0.97	0.25	0.15	0.62	9.86	7.71
Queue Length 95th (ft)	317	0	0	0	Err	Err
Control Delay (s)	59.8	0.0	0.0	0.0	Err	Err
Lane LOS	F				F	F
Approach Delay (s)	37.6		0.0		Err	
Approach LOS					F	

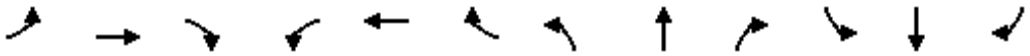
Intersection Summary				
Average Delay	560.2			
Intersection Capacity Utilization	81.9%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	530	87	2	976	79	135	36	48	22	10	86
Future Volume (Veh/h)	74	530	87	2	976	79	135	36	48	22	10	86
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	80	576	95	2	1061	86	147	39	52	24	11	93
Pedestrians					5			8			11	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					3.5			3.5			3.5	
Percent Blockage					0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1158			679			1424	1954	348	1644	1958	584
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1158			679			1424	1954	348	1644	1958	584
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	87			100			0	27	92	0	79	79
cM capacity (veh/h)	593			902			56	54	640	22	53	450

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	368	383	532	616	166	72	128
Volume Left	80	0	2	0	147	0	24
Volume Right	0	95	0	86	0	52	93
cSH	593	1700	902	1700	56	161	85
Volume to Capacity	0.13	0.23	0.00	0.36	2.97	0.44	1.51
Queue Length 95th (ft)	12	0	0	0	435	51	253
Control Delay (s)	4.1	0.0	0.1	0.0	1044.8	44.2	367.1
Lane LOS	A		A		F	E	F
Approach Delay (s)	2.0		0.0		744.2		367.1
Approach LOS					F		F

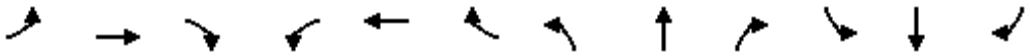
Intersection Summary				
Average Delay	99.6			
Intersection Capacity Utilization	73.5%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	568	5	2	1037	16	20	2	3	0	0	0
Future Volume (Veh/h)	27	568	5	2	1037	16	20	2	3	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	617	5	2	1127	17	22	2	3	0	0	0
Pedestrians		2			2			5			7	
Lane Width (ft)		12.0			12.0			12.0			0.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1151			627			1250	1835	624	1828	1832	581
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1151			627			1250	1835	624	1828	1832	581
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			100			82	97	99	100	100	100
cM capacity (veh/h)	603			946			123	71	425	44	71	456

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	646	5	566	580	27
Volume Left	29	0	2	0	22
Volume Right	0	5	0	17	3
cSH	603	1700	946	1700	126
Volume to Capacity	0.05	0.00	0.00	0.34	0.21
Queue Length 95th (ft)	4	0	0	0	19
Control Delay (s)	1.3	0.0	0.1	0.0	41.1
Lane LOS	A		A		E
Approach Delay (s)	1.3		0.0		41.1
Approach LOS					E

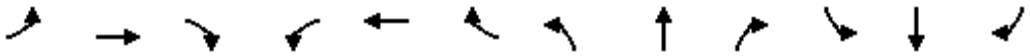
Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	67.0%	ICU Level of Service		C
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	520	34	29	987	45	54	1	41	1	2	14
Future Volume (Veh/h)	17	520	34	29	987	45	54	1	41	1	2	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	565	37	32	1073	49	59	1	45	1	2	15
Pedestrians					11			8			3	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					3.5			3.5			3.5	
Percent Blockage					1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					639							
pX, platoon unblocked	0.51						0.51	0.51		0.51	0.51	0.51
vC, conflicting volume	1125			610			1762	1798	584	1798	1786	1076
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	761			610			2016	2087	584	2086	2063	665
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			97			0	96	91	94	92	94
cM capacity (veh/h)	431			961			18	25	502	16	25	233

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	583	37	1105	49	105	18
Volume Left	18	0	32	0	59	1
Volume Right	0	37	0	49	45	15
cSH	431	1700	961	1700	31	88
Volume to Capacity	0.04	0.02	0.03	0.03	3.40	0.21
Queue Length 95th (ft)	3	0	3	0	Err	18
Control Delay (s)	1.3	0.0	1.0	0.0	Err	56.4
Lane LOS	A		A		F	F
Approach Delay (s)	1.2		1.0		Err	56.4
Approach LOS					F	F

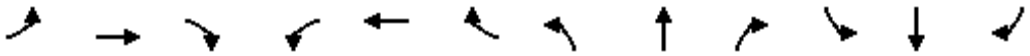
Intersection Summary				
Average Delay	555.0			
Intersection Capacity Utilization	94.9%	ICU Level of Service		F
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	454	66	63	589	16	448	152	109	10	74	55
Future Volume (vph)	31	454	66	63	589	16	448	152	109	10	74	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.94		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1817		1759	1852		1754	1724		1759	1719	
Flt Permitted	0.19	1.00		0.27	1.00		0.67	1.00		0.51	1.00	
Satd. Flow (perm)	359	1817		498	1852		1233	1724		941	1719	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	493	72	68	640	17	487	165	118	11	80	60
RTOR Reduction (vph)	0	7	0	0	1	0	0	31	0	0	33	0
Lane Group Flow (vph)	34	558	0	68	656	0	487	252	0	11	107	0
Confl. Peds. (#/hr)	28		10	10		28	5		5	5		5
Confl. Bikes (#/hr)			4			5			1			2
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	37.8	37.8		37.8	37.8		34.2	34.2		34.2	34.2	
Effective Green, g (s)	37.8	37.8		37.8	37.8		34.2	34.2		34.2	34.2	
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.43	0.43		0.43	0.43	
Clearance Time (s)	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	
Lane Grp Cap (vph)	169	858		235	875		527	737		402	734	
v/s Ratio Prot		0.31			c0.35			0.15			0.06	
v/s Ratio Perm	0.09			0.14			c0.40			0.01		
v/c Ratio	0.20	0.65		0.29	0.75		0.92	0.34		0.03	0.15	
Uniform Delay, d1	12.3	16.1		12.9	17.2		21.7	15.3		13.3	14.0	
Progression Factor	1.00	1.00		0.86	0.82		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.7	3.8		2.7	5.1		22.0	0.3		0.0	0.1	
Delay (s)	15.0	19.9		13.7	19.2		43.7	15.6		13.3	14.1	
Level of Service	B	B		B	B		D	B		B	B	
Approach Delay (s)		19.6			18.7			33.4			14.0	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	101.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	500	10	5	610	25	23	63	21	23	32	26
Future Volume (vph)	22	500	10	5	610	25	23	63	21	23	32	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	0.98	1.00		0.99	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.97			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1736	1855		1744	1845			1774			1729	
Flt Permitted	0.31	1.00		0.39	1.00			0.93			0.91	
Satd. Flow (perm)	558	1855		712	1845			1676			1596	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	543	11	5	663	27	25	68	23	25	35	28
RTOR Reduction (vph)	0	1	0	0	2	0	0	11	0	0	21	0
Lane Group Flow (vph)	24	553	0	5	688	0	0	105	0	0	67	0
Confl. Peds. (#/hr)	35		19	19		35	6		9	9		6
Confl. Bikes (#/hr)			7			6			4			4
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	53.0	53.0		53.0	53.0			19.0			19.0	
Effective Green, g (s)	53.0	53.0		53.0	53.0			19.0			19.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.24			0.24	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	369	1228		471	1222			398			379	
v/s Ratio Prot		0.30			c0.37							
v/s Ratio Perm	0.04			0.01				c0.06			0.04	
v/c Ratio	0.07	0.45		0.01	0.56			0.26			0.18	
Uniform Delay, d1	4.8	6.5		4.6	7.3			24.8			24.3	
Progression Factor	0.63	0.52		0.40	0.44			1.00			1.00	
Incremental Delay, d2	0.3	1.1		0.0	1.7			1.6			1.0	
Delay (s)	3.3	4.4		1.9	4.9			26.4			25.3	
Level of Service	A	A		A	A			C			C	
Approach Delay (s)		4.4			4.9			26.4			25.3	
Approach LOS		A			A			C			C	

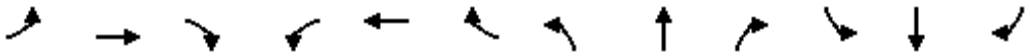
Intersection Summary			
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	453	17	38	553	24	27	27	45	48	20	60
Future Volume (vph)	74	453	17	38	553	24	27	27	45	48	20	60
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	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.95		1.00	0.96	
Flpb, ped/bikes	0.97	1.00		0.99	1.00			0.99		0.94	1.00	
Frt	1.00	0.99		1.00	0.99			0.94		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1724	1850		1750	1843			1627		1661	1580	
Flt Permitted	0.34	1.00		0.42	1.00			0.92		0.69	1.00	
Satd. Flow (perm)	622	1850		766	1843			1512		1202	1580	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	492	18	41	601	26	29	29	49	52	22	65
RTOR Reduction (vph)	0	2	0	0	2	0	0	37	0	0	50	0
Lane Group Flow (vph)	80	508	0	41	625	0	0	70	0	52	37	0
Confl. Peds. (#/hr)	40		13	13		40	14		37	37		14
Confl. Bikes (#/hr)			7			4			8			7
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	53.0	53.0		53.0	53.0			19.0		19.0	19.0	
Effective Green, g (s)	53.0	53.0		53.0	53.0			19.0		19.0	19.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.24		0.24	0.24	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	412	1225		507	1220			359		285	375	
v/s Ratio Prot		0.27			c0.34						0.02	
v/s Ratio Perm	0.13			0.05				c0.05		0.04		
v/c Ratio	0.19	0.41		0.08	0.51			0.19		0.18	0.10	
Uniform Delay, d1	5.2	6.3		4.8	6.9			24.4		24.3	23.8	
Progression Factor	0.78	0.67		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	1.0	1.0		0.3	1.5			1.2		1.4	0.5	
Delay (s)	5.1	5.1		5.1	8.4			25.6		25.7	24.4	
Level of Service	A	A		A	A			C		C	C	
Approach Delay (s)		5.1			8.2			25.6			24.9	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		

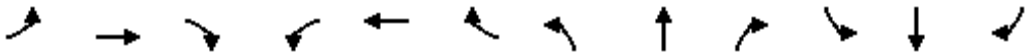
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	495	30	10	541	38	36	4	64	26	18	38
Future Volume (Veh/h)	21	495	30	10	541	38	36	4	64	26	18	38
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	538	33	11	588	41	39	4	70	28	20	41
Pedestrians		10			17			9			14	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		1			2			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		315			340							
pX, platoon unblocked	0.81						0.81	0.81		0.81	0.81	0.81
vC, conflicting volume	643			580			1280	1274	312	1028	1250	612
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	444			580			1230	1222	312	919	1192	406
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			53	97	90	81	86	91
cM capacity (veh/h)	891			982			83	136	667	149	142	471

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	292	302	599	41	113	89
Volume Left	23	0	11	0	39	28
Volume Right	0	33	0	41	70	41
cSH	891	1700	982	1700	187	214
Volume to Capacity	0.03	0.18	0.01	0.02	0.60	0.42
Queue Length 95th (ft)	2	0	1	0	84	48
Control Delay (s)	1.0	0.0	0.3	0.0	49.8	33.2
Lane LOS	A		A		E	D
Approach Delay (s)	0.5		0.3		49.8	33.2
Approach LOS					E	D

Intersection Summary			
Average Delay	6.3		
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	153	323	109	38	303	71	191	976	32	126	785	95
Future Volume (vph)	153	323	109	38	303	71	191	976	32	126	785	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	4.5		4.0	4.5	
Lane Util. Factor		0.95			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.98		1.00	1.00		1.00	0.98	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3353			1791		1770	3518		1770	3437	
Flt Permitted		0.61			0.84		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2065			1515		1770	3518		1770	3437	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	166	351	118	41	329	77	208	1061	35	137	853	103
RTOR Reduction (vph)	0	23	0	0	9	0	0	2	0	0	9	0
Lane Group Flow (vph)	0	612	0	0	438	0	208	1094	0	137	947	0
Confl. Peds. (#/hr)	45		28	28		45	37		15	15		37
Confl. Bikes (#/hr)			8			3			6			9
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		28.9			28.9		14.1	36.7		10.9	33.5	
Effective Green, g (s)		28.9			28.9		14.1	36.7		10.9	33.5	
Actuated g/C Ratio		0.32			0.32		0.16	0.41		0.12	0.37	
Clearance Time (s)		5.0			5.0		4.0	4.5		4.0	4.5	
Vehicle Extension (s)		2.0			2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		663			486		277	1434		214	1279	
v/s Ratio Prot							c0.12	c0.31		0.08	0.28	
v/s Ratio Perm		c0.30			0.29							
v/c Ratio		0.92			0.90		0.75	0.76		0.64	0.74	
Uniform Delay, d1		29.5			29.2		36.3	22.9		37.7	24.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		18.2			19.4		9.7	3.9		4.8	3.9	
Delay (s)		47.7			48.6		46.0	26.8		42.5	28.4	
Level of Service		D			D		D	C		D	C	
Approach Delay (s)		47.7			48.6			29.9			30.1	
Approach LOS		D			D			C			C	

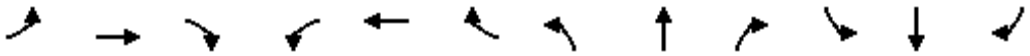
Intersection Summary			
HCM 2000 Control Delay	35.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	94.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	20	29	187	2	2	98
Future Volume (vph)	20	29	187	2	2	98
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	32	203	2	2	107

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	54	205	109
Volume Left (vph)	22	0	2
Volume Right (vph)	32	2	0
Hadj (s)	-0.24	0.03	0.04
Departure Headway (s)	4.3	4.2	4.3
Degree Utilization, x	0.07	0.24	0.13
Capacity (veh/h)	763	844	824
Control Delay (s)	7.6	8.5	7.9
Approach Delay (s)	7.6	8.5	7.9
Approach LOS	A	A	A

Intersection Summary			
Delay	8.2		
Level of Service	A		
Intersection Capacity Utilization	20.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	0	0	0	0	0	27	18	0	0	0	22
Future Volume (vph)	4	0	0	0	0	0	27	18	0	0	0	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	0	0	0	0	0	29	20	0	0	0	24

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	4	0	29	20	24
Volume Left (vph)	4	0	29	0	0
Volume Right (vph)	0	0	0	0	24
Hadj (s)	0.23	0.00	0.53	0.03	-0.57
Departure Headway (s)	4.3	4.1	5.1	4.6	3.5
Degree Utilization, x	0.00	0.00	0.04	0.03	0.02
Capacity (veh/h)	819	900	701	777	1021
Control Delay (s)	7.3	7.1	7.1	6.5	6.6
Approach Delay (s)	7.3	0.0	6.8		6.6
Approach LOS	A	A	A		A

Intersection Summary				
Delay	6.8			
Level of Service	A			
Intersection Capacity Utilization	18.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection: 1: Frontage Rd & Gilman St

Movement	EB	WB	NB	SB
Directions Served	LT	LT	LTR	LTR
Maximum Queue (ft)	73	76	249	53
Average Queue (ft)	27	34	179	20
95th Queue (ft)	70	68	288	48
Link Distance (ft)	433	60	215	224
Upstream Blk Time (%)		1	34	
Queuing Penalty (veh)		2	0	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Gilman St & WB I-80 Ramps

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	TR	LT	T	L	LTR
Maximum Queue (ft)	94	107	158	111	433	450
Average Queue (ft)	63	39	54	4	388	370
95th Queue (ft)	92	93	110	37	488	557
Link Distance (ft)	60	60	195	195	395	395
Upstream Blk Time (%)	21	6			70	42
Queuing Penalty (veh)	68	21			258	153
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: EB I-80 Ramps & Gilman St

Movement	EB	EB	WB	WB	NB	NB
Directions Served	LT	T	T	TR	LT	TR
Maximum Queue (ft)	234	167	32	31	31	160
Average Queue (ft)	201	11	3	15	18	58
95th Queue (ft)	241	77	19	39	42	105
Link Distance (ft)	195	195	14	14	382	382
Upstream Blk Time (%)	23		0	2		
Queuing Penalty (veh)	119		1	10		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Eastshore Hwy & Gilman St

Movement	EB	WB	WB	NB	NB	SB	B40	B36
Directions Served	LT	LT	TR	LT	TR	LTR	T	T
Maximum Queue (ft)	31	16	102	146	146	179	169	346
Average Queue (ft)	30	2	25	137	36	151	131	263
95th Queue (ft)	31	9	80	153	131	174	197	471
Link Distance (ft)	14	113	113	130	130	85	72	331
Upstream Blk Time (%)	33		0	96	15	96	89	64
Queuing Penalty (veh)	114		0	0	0	113	105	75
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 5: Second St & Gilman St

Movement	EB	B43	WB	NB
Directions Served	LT	T	TR	LTR
Maximum Queue (ft)	83	49	72	46
Average Queue (ft)	30	7	2	14
95th Queue (ft)	89	33	24	36
Link Distance (ft)	12	113	616	621
Upstream Blk Time (%)	5			
Queuing Penalty (veh)	14			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: 4th St & Gilman St

Movement	EB	EB	WB	NB	SB
Directions Served	LT	R	LT	LTR	LTR
Maximum Queue (ft)	268	94	205	127	53
Average Queue (ft)	26	3	67	45	14
95th Queue (ft)	116	31	172	101	41
Link Distance (ft)	616		270	568	626
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		70			
Storage Blk Time (%)	2		2		
Queuing Penalty (veh)	1		1		

Intersection: 7: 6th St & Gilman St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	270	165	105	265	115	651	31	96
Average Queue (ft)	96	135	43	194	113	353	9	49
95th Queue (ft)	264	195	99	291	117	580	31	88
Link Distance (ft)	248			250		636		585
Upstream Blk Time (%)	2			4		2		
Queuing Penalty (veh)	9			27		0		
Storage Bay Dist (ft)		140	80		90		65	
Storage Blk Time (%)	0	11	0	36	52	7		4
Queuing Penalty (veh)	0	3	3	23	135	30		0

Intersection: 8: 8th St & Gilman St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	LTR	LTR
Maximum Queue (ft)	31	261	30	120	138	115
Average Queue (ft)	11	69	2	38	63	46
95th Queue (ft)	34	162	15	91	116	84
Link Distance (ft)		260		289	638	424
Upstream Blk Time (%)		0				
Queuing Penalty (veh)		1				
Storage Bay Dist (ft)	50		65			
Storage Blk Time (%)	0	9		2		
Queuing Penalty (veh)	0	2		0		

Intersection: 9: 9th St & Gilman St

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	L	TR
Maximum Queue (ft)	104	158	99	232	160	93	96
Average Queue (ft)	38	67	30	117	49	34	41
95th Queue (ft)	82	140	69	225	103	69	78
Link Distance (ft)		289		253	599		398
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	80		75			90	
Storage Blk Time (%)	0	6	1	13		0	0
Queuing Penalty (veh)	1	4	3	5		0	0

Intersection: 10: 10th St & Gilman St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	R	LTR	LTR
Maximum Queue (ft)	54	71	138	76	95	106
Average Queue (ft)	11	14	21	4	43	40
95th Queue (ft)	42	56	72	27	73	80
Link Distance (ft)	253		265		656	393
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		50		75		
Storage Blk Time (%)	1	0	0	0		
Queuing Penalty (veh)	3	1	0	0		

Intersection: 11: San Pablo Ave & Gilman St

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	263	202	417	185	361	359	174	314	275
Average Queue (ft)	146	124	234	144	243	204	104	211	181
95th Queue (ft)	228	183	366	219	362	322	198	302	281
Link Distance (ft)	265	265	515		833	833		698	698
Upstream Blk Time (%)	0								
Queuing Penalty (veh)	0								
Storage Bay Dist (ft)				160			150		
Storage Blk Time (%)				11	18			19	
Queuing Penalty (veh)				55	35			24	

Intersection: 12: Harrison St & Eastshore Hwy

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	202	68	310
Average Queue (ft)	71	34	177
95th Queue (ft)	184	49	356
Link Distance (ft)	196	331	295
Upstream Blk Time (%)	8		26
Queuing Penalty (veh)	4		0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: Harrison St & Second St

Movement	EB	NB	NB	SB
Directions Served	LT	L	TR	LTR
Maximum Queue (ft)	24	50	30	54
Average Queue (ft)	2	20	17	25
95th Queue (ft)	14	46	41	55
Link Distance (ft)	196	98	98	149
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

2020 No Build Conditions

2020 Intersection Approach Level-of-Services

ID	Intersection	Control Type	Approach	2020 AM Peak Hour						2020 PM Peak Hour					
				No Build			Build			No Build			Build		
				Delay [a]	LOS [b]	V/C[e]	Delay [a]	LOS [b]	V/C	Delay	LOS [b]	V/C[e]	Delay	LOS [b]	V/C
1	Gilman St. at Frontage Rd.	TWSC [c]	Eastbound	0.2	A	0.01	37.1	D	0.63	0.0	A	0.01	13.1	B	0.44
			Westbound	10.9	B	0.66	n/a	n/a	n/a	5.9	A	0.28	n/a	n/a	n/a
			Northbound	>50.0	**F**	1.51	13.6	B	0.29	26.2	D	0.78	72.8	E	1.02
			Southbound	>50.0	**F**	1.36	n/a	n/a	n/a	>50.0	**F**	0.83	n/a	n/a	n/a
2	Gilman St. at WB I-80 Ramps	TWSC [c]	Eastbound	0.0	A	0.1	n/a	n/a	n/a	0.0	A	0.28	n/a	n/a	n/a
			Westbound	4.1	A	0.26	5.2	A	0.34	6.1	A	0.26	3.8	A	0.15
			Southbound	>50.0	**F**	4.29	41.6	D	0.94	>50.0	**F**	2.27	10.8	B	0.53
3	Gilman St. at EB I-80 Ramps	TWSC [c]	Eastbound	1.5	A	0.29	9.4	A	0.59	>50.0	**F**	1.05	21.2	C	0.87
			Westbound	0.0	A	0.42	n/a	n/a	n/a	0.0	A	0.62	n/a	n/a	n/a
			Northbound	27.3	D	0.68	20.3	C	0.66	>50.0	**F**	n/a	15.0	B	0.34
4	Gilman St. at Eastshore Hwy.	TWSC [c]	Eastbound	0.5	A	0.42	n/a	n/a	n/a	2.2	A	0.24	n/a	n/a	n/a
			Westbound	0.3	A	0.27	5.3	A	0.37	0.0	A	0.36	20.0	B	0.82
			Northbound	>50.0	**F**	n/a	8.6	A	0.13	>50.0	**F**	4.05	25.7	C	0.57
			Southbound	>50.0	**F**	3.92	16.1	B	0.6	>50.0	**F**	2.61	20.2	C	0.42
5	Gilman St. at Second St.	TWSC [c]	Eastbound	1.3	A	0.05	1.3	A	0.05	1.5	A	0.06	1.5	A	0.06
			Westbound	0.1	A	0.28	0.1	A	0.28	0.0	A	0.36	0.0	A	0.36
			Northbound	32.2	D	0.13	32.2	D	0.13	>50.0	**F**	0.35	>50.0	**F**	0.35
6	Gilman St. at 4th St.	TWSC [c]	Eastbound	5.8	A	0.62	5.8	A	0.62	3.7	A	0.49	3.7	A	0.49
			Westbound	8.4	A	0.74	8.4	A	0.74	11.3	B	0.86	11.3	B	0.86
			Northbound	14.4	B	0.15	14.4	B	0.15	27.6	C	0.3	27.6	C	0.3
			Southbound	14.0	B	0.07	14.0	B	0.07	25.7	C	0.03	25.7	C	0.03
7	Gilman St. at 6th St.	Signal	Eastbound	10.7	B	0.59	10.7	B	0.59	22.1	C	0.73	22.1	C	0.73
			Westbound	14.5	B	0.58	14.5	B	0.58	20.0	B	0.79	20.0	B	0.79
			Northbound	24.2	C	0.62	24.2	C	0.62	37.3	D	0.93	37.3	D	0.93
			Southbound	22.8	C	0.56	22.8	C	0.56	14.0	B	0.13	14.0	B	0.13
8	Gilman St. at 8th St.	Signal	Eastbound	6.2	A	0.46	6.2	A	0.46	3.7	A	0.54	3.7	A	0.54
			Westbound	7.5	A	0.61	7.5	A	0.61	5.5	A	0.6	5.5	A	0.6
			Northbound	19.0	B	0.05	19.0	B	0.05	28.5	C	0.39	28.5	C	0.39

ID	Intersection	Control Type	Approach	2020 AM Peak Hour						2020 PM Peak Hour					
				No Build			Build			No Build			Build		
				Delay [a]	LOS [b]	V/C[e]	Delay [a]	LOS [b]	V/C	Delay	LOS [b]	V/C[e]	Delay	LOS [b]	V/C
			Southbound	22.5	C	0.34	22.5	C	0.34	25.9	C	0.22	25.9	C	0.22
9	Gilman St. at 9th St.	Signal	Eastbound	2.5	A	034	2.5	A	034	6.2	A	0.48	6.2	A	0.48
			Westbound	10.3	B	0.6	10.3	B	0.6	8.5	A	0.53	8.5	A	0.53
			Northbound	19.8	B	0.12	19.8	B	0.12	27.0	C	0.29	27.0	C	0.29
			Southbound	19.6	B	0.12	19.6	B	0.12	25.0	C	24.4	25.0	C	24.4
10	Gilman St. at 10th St.	TWSC [c]	Eastbound	0.6	A	0.14	0.6	A	0.14	0.5	A	0.2	0.5	A	0.2
			Westbound	0.6	A	0.04	0.6	A	0.04	0.3	A	0.03	0.3	A	0.03
			Northbound	26.6	D	0.3	26.6	D	0.3	>50.0	**F**	0.99	>50.0	**F**	0.99
			Southbound	27.7	D	0.3	27.7	D	0.3	42.9	E	0.49	42.9	E	0.49
11	Gilman St. at San Pablo Ave.	Signal	Eastbound	21.0	C	0.4	21.0	C	0.4	55.7	E	0.97	55.7	E	0.97
			Westbound	48.0	D	0.93	48.0	D	0.93	46.7	D	0.9	46.7	D	0.9
			Northbound	21.4	C	0.64	21.4	C	0.64	35.8	D	0.86	35.8	D	0.86
			Southbound	51.4	D	1.01	51.4	D	1.01	40.7	D	0.91	40.7	D	0.91
12	Eastshore Hwy. at Harrison St.	AWSC [d]	Westbound	8.8	A	0.1	8.8	A	0.1	8.0	A	0.11	8.0	A	0.11
			Northbound	8.0	A	0.08	8.0	A	0.08	8.8	A	0.27	8.8	A	0.27
			Southbound	13.1	B	0.61	13.1	B	0.61	8.1	A	0.15	8.1	A	0.15
13	Second St. at Harrison St.	AWSC [d]	Eastbound	7.4	A	0.02	7.4	A	0.02	7.4	A	0.0	7.4	A	0.0
			Westbound	0.0	A	0.0	0.0	A	0.0	0.0	A	0.0	0.0	A	0.0
			Northbound	6.9	A	0.05	6.9	A	0.05	7.0	A	0.09	7.0	A	0.09
			Southbound	6.6	A	0.03	6.6	A	0.03	6.6	A	0.02	6.6	A	0.02

Source: TJKM, 2016

Notes:

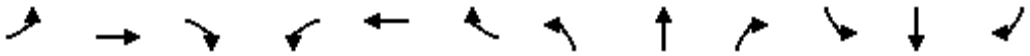
a. Delay in seconds per vehicle. For Signalized and all-way-stop controlled intersections, overall (intersection) delay reported. For two-way stop-control intersections, the worst approach is reported.

b. LOS-Level of Service.

c. TWSC-Two-way-stop-control. Delay and LOS of the worst approach are reported.

d. AWSC-All-way-stop-control.

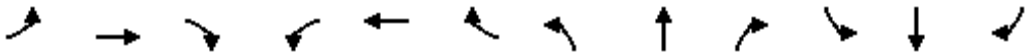
d. If an approach has more than one lane group, the worse lane group v/c was reported.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	134	12	867	166	19	14	0	101	8	3	5
Future Volume (Veh/h)	3	134	12	867	166	19	14	0	101	8	3	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	146	13	942	180	21	15	0	110	9	3	5
Pedestrians		7									1	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		3.5									3.5	
Percent Blockage		1									0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	202			159			2140	2238	146	2338	2240	108
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	202			159			2140	2238	146	2338	2240	108
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			34			0	100	87	0	78	99
cM capacity (veh/h)	1366			1418			11	14	875	8	14	917

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	149	13	1032	111	125	17
Volume Left	3	0	942	0	15	9
Volume Right	0	13	0	21	110	5
cSH	1366	1700	1418	1700	83	12
Volume to Capacity	0.00	0.01	0.66	0.07	1.51	1.36
Queue Length 95th (ft)	0	0	136	0	249	71
Control Delay (s)	0.2	0.0	12.1	0.0	368.7	802.6
Lane LOS	A		B		F	F
Approach Delay (s)	0.2		10.9		368.7	802.6
Approach LOS					F	F

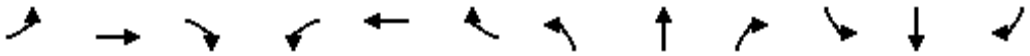
Intersection Summary				
Average Delay	49.9			
Intersection Capacity Utilization	72.4%	ICU Level of Service		C
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	125	118	313	450	0	0	0	0	625	49	602
Future Volume (Veh/h)	0	125	118	313	450	0	0	0	0	625	49	602
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	136	128	340	489	0	0	0	0	679	53	654
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					1250							
pX, platoon unblocked												
vC, conflicting volume	489			264			1805	1369	132	1237	1433	244
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	489			264			1805	1369	132	1237	1433	244
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			74			100	100	100	0	46	13
cM capacity (veh/h)	1070			1297			3	107	893	105	98	756

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	91	173	503	326	453	933
Volume Left	0	0	340	0	453	226
Volume Right	0	128	0	0	0	654
cSH	1700	1700	1297	1700	105	263
Volume to Capacity	0.05	0.10	0.26	0.19	4.29	3.55
Queue Length 95th (ft)	0	0	26	0	Err	Err
Control Delay (s)	0.0	0.0	6.7	0.0	Err	Err
Lane LOS			A		F	F
Approach Delay (s)	0.0		4.1		Err	
Approach LOS					F	

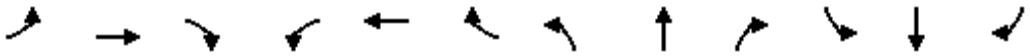
Intersection Summary				
Average Delay	5591.8			
Intersection Capacity Utilization	75.8%	ICU Level of Service		D
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	690	0	0	733	415	30	5	342	0	0	0
Future Volume (Veh/h)	60	690	0	0	733	415	30	5	342	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	750	0	0	797	451	33	5	372	0	0	0
Pedestrians								12			9	
Lane Width (ft)								12.0			0.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					1018							
pX, platoon unblocked												
vC, conflicting volume	1257			762			1290	2149	387	1911	1924	633
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1257			762			1290	2149	387	1911	1924	633
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	88			100			69	88	38	100	100	100
cM capacity (veh/h)	549			836			108	42	604	13	58	422

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	315	500	531	717	36	374
Volume Left	65	0	0	0	33	0
Volume Right	0	0	0	451	0	372
cSH	549	1700	1700	1700	97	554
Volume to Capacity	0.12	0.29	0.31	0.42	0.37	0.68
Queue Length 95th (ft)	10	0	0	0	37	127
Control Delay (s)	3.9	0.0	0.0	0.0	62.4	24.0
Lane LOS	A				F	C
Approach Delay (s)	1.5		0.0		27.3	
Approach LOS					D	

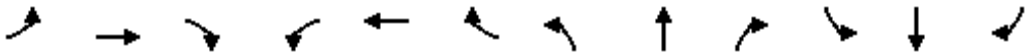
Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	76.8%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	685	317	11	780	26	38	2	24	48	126	330
Future Volume (Veh/h)	30	685	317	11	780	26	38	2	24	48	126	330
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	745	345	12	848	28	41	2	26	52	137	359
Pedestrians					1			8			6	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					3.5			3.5			3.5	
Percent Blockage					0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					934							
pX, platoon unblocked												
vC, conflicting volume	882			1098			1867	1898	554	1358	2056	444
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	882			1098			1867	1898	554	1358	2056	444
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			98			0	97	94	44	0	36
cM capacity (veh/h)	758			627			0	64	472	93	51	558

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	406	718	436	452	42	27	548
Volume Left	33	0	12	0	41	0	52
Volume Right	0	345	0	28	0	26	359
cSH	758	1700	627	1700	0	381	140
Volume to Capacity	0.04	0.42	0.02	0.27	Err	0.07	3.92
Queue Length 95th (ft)	3	0	1	0	Err	6	Err
Control Delay (s)	1.3	0.0	0.6	0.0	Err	15.2	Err
Lane LOS	A		A		F	C	F
Approach Delay (s)	0.5		0.3		Err		Err
Approach LOS					F		F

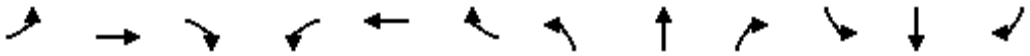
Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	94.9%	ICU Level of Service	F	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	711	14	6	806	35	11	0	6	0	0	0
Future Volume (Veh/h)	32	711	14	6	806	35	11	0	6	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	773	15	7	876	38	12	0	7	0	0	0
Pedestrians								1			4	
Lane Width (ft)								12.0			0.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					686							
pX, platoon unblocked												
vC, conflicting volume	918			789			1296	1776	774	1763	1772	461
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	918			789			1296	1776	774	1763	1772	461
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			99			89	100	98	100	100	100
cM capacity (veh/h)	739			826			114	77	341	50	78	547

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	808	15	445	476	19
Volume Left	35	0	7	0	12
Volume Right	0	15	0	38	7
cSH	739	1700	826	1700	151
Volume to Capacity	0.05	0.01	0.01	0.28	0.13
Queue Length 95th (ft)	4	0	1	0	11
Control Delay (s)	1.3	0.0	0.3	0.0	32.2
Lane LOS	A		A		D
Approach Delay (s)	1.3		0.1		32.2
Approach LOS					D

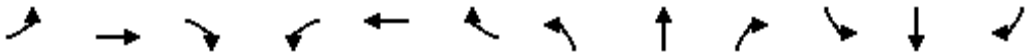
Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	73.4%	ICU Level of Service		D
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	607	91	26	718	3	32	0	20	2	0	97
Future Volume (vph)	19	607	91	26	718	3	32	0	20	2	0	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5		4.5			4.5	
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.97		1.00	0.96		0.99			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.95			0.87	
Flt Protected		1.00	1.00		1.00	1.00		0.97			1.00	
Satd. Flow (prot)		1860	1529		1859	1518		1694			1614	
Flt Permitted		0.97	1.00		0.97	1.00		0.78			0.99	
Satd. Flow (perm)		1808	1529		1807	1518		1359			1606	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	660	99	28	780	3	35	0	22	2	0	105
RTOR Reduction (vph)	0	0	29	0	0	1	0	22	0	0	87	0
Lane Group Flow (vph)	0	681	70	0	808	2	0	35	0	0	20	0
Confl. Peds. (#/hr)	17		10	10		17			8	8		
Confl. Bikes (#/hr)			6			5						
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		24.1	24.1		24.1	24.1		6.8			6.8	
Effective Green, g (s)		24.1	24.1		24.1	24.1		6.8			6.8	
Actuated g/C Ratio		0.60	0.60		0.60	0.60		0.17			0.17	
Clearance Time (s)		4.5	4.5		4.5	4.5		4.5			4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		1092	923		1091	916		231			273	
v/s Ratio Prot												
v/s Ratio Perm		0.38	0.05		c0.45	0.00		c0.03			0.01	
v/c Ratio		0.62	0.08		0.74	0.00		0.15			0.07	
Uniform Delay, d1		5.0	3.3		5.7	3.1		14.1			13.9	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		1.1	0.0		2.7	0.0		0.3			0.1	
Delay (s)		6.1	3.3		8.4	3.1		14.4			14.0	
Level of Service		A	A		A	A		B			B	
Approach Delay (s)		5.8			8.4			14.4			14.0	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	39.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		

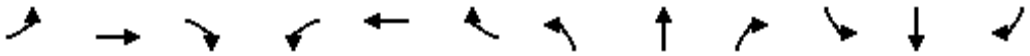
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	452	154	77	552	43	119	33	43	15	197	76
Future Volume (vph)	23	452	154	77	552	43	119	33	43	15	197	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.99		1.00	0.92		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1781		1768	1834		1748	1675		1761	1761	
Flt Permitted	0.31	1.00		0.30	1.00		0.40	1.00		0.70	1.00	
Satd. Flow (perm)	563	1781		555	1834		741	1675		1303	1761	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	491	167	84	600	47	129	36	47	16	214	83
RTOR Reduction (vph)	0	18	0	0	4	0	0	34	0	0	19	0
Lane Group Flow (vph)	25	640	0	84	643	0	129	49	0	16	278	0
Confl. Peds. (#/hr)	21		2	2		21	12		3	3		12
Confl. Bikes (#/hr)			2			8			4			4
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	42.4	42.4		42.4	42.4		19.6	19.6		19.6	19.6	
Effective Green, g (s)	42.4	42.4		42.4	42.4		19.6	19.6		19.6	19.6	
Actuated g/C Ratio	0.61	0.61		0.61	0.61		0.28	0.28		0.28	0.28	
Clearance Time (s)	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	
Lane Grp Cap (vph)	341	1078		336	1110		207	469		364	493	
v/s Ratio Prot		c0.36			0.35			0.03			0.16	
v/s Ratio Perm	0.04			0.15			c0.17			0.01		
v/c Ratio	0.07	0.59		0.25	0.58		0.62	0.10		0.04	0.56	
Uniform Delay, d1	5.7	8.5		6.4	8.4		22.0	18.7		18.4	21.5	
Progression Factor	1.00	1.00		1.49	1.57		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	2.4		1.4	1.8		5.7	0.1		0.1	1.5	
Delay (s)	6.1	10.9		11.0	14.9		27.7	18.8		18.4	23.0	
Level of Service	A	B		B	B		C	B		B	C	
Approach Delay (s)		10.7			14.5			24.2			22.8	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	94.0%	ICU Level of Service	F
Analysis Period (min)	15		

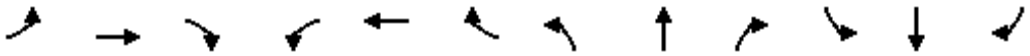
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	387	91	23	615	27	7	9	9	23	93	50
Future Volume (vph)	32	387	91	23	615	27	7	9	9	23	93	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			0.98			0.99	
Flpb, ped/bikes	0.99	1.00		0.99	1.00			1.00			1.00	
Frt	1.00	0.97		1.00	0.99			0.95			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1747	1797		1759	1845			1715			1746	
Flt Permitted	0.28	1.00		0.39	1.00			0.93			0.97	
Satd. Flow (perm)	512	1797		731	1845			1616			1697	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	421	99	25	668	29	8	10	10	25	101	54
RTOR Reduction (vph)	0	12	0	0	2	0	0	7	0	0	22	0
Lane Group Flow (vph)	35	508	0	25	695	0	0	21	0	0	158	0
Confl. Peds. (#/hr)	28		8	8		28	7		11	11		7
Confl. Bikes (#/hr)			4			8			5			10
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	43.0	43.0		43.0	43.0			19.0			19.0	
Effective Green, g (s)	43.0	43.0		43.0	43.0			19.0			19.0	
Actuated g/C Ratio	0.61	0.61		0.61	0.61			0.27			0.27	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	314	1103		449	1133			438			460	
v/s Ratio Prot		0.28			c0.38							
v/s Ratio Perm	0.07			0.03				0.01			c0.09	
v/c Ratio	0.11	0.46		0.06	0.61			0.05			0.34	
Uniform Delay, d1	5.6	7.3		5.4	8.4			18.8			20.5	
Progression Factor	0.58	0.72		0.86	0.66			1.00			1.00	
Incremental Delay, d2	0.6	1.2		0.2	2.1			0.2			2.0	
Delay (s)	3.8	6.4		4.9	7.6			19.0			22.5	
Level of Service	A	A		A	A			B			C	
Approach Delay (s)		6.2			7.5			19.0			22.5	
Approach LOS		A			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

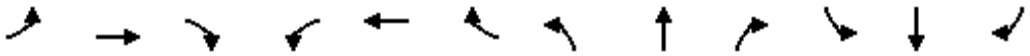
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	318	42	46	581	41	25	16	23	22	31	59
Future Volume (vph)	59	318	42	46	581	41	25	16	23	22	31	59
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	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99			0.97		1.00	0.97	
Flpb, ped/bikes	0.98	1.00		0.99	1.00			1.00		0.96	1.00	
Frt	1.00	0.98		1.00	0.99			0.95		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1743	1821		1752	1834			1683		1705	1637	
Flt Permitted	0.29	1.00		0.49	1.00			0.89		0.78	1.00	
Satd. Flow (perm)	534	1821		898	1834			1526		1407	1637	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	346	46	50	632	45	27	17	25	24	34	64
RTOR Reduction (vph)	0	7	0	0	3	0	0	18	0	0	47	0
Lane Group Flow (vph)	64	385	0	50	674	0	0	51	0	24	51	0
Confl. Peds. (#/hr)	31		10	10		31	7		22	22		7
Confl. Bikes (#/hr)			6			8			12			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	43.0	43.0		43.0	43.0			19.0		19.0	19.0	
Effective Green, g (s)	43.0	43.0		43.0	43.0			19.0		19.0	19.0	
Actuated g/C Ratio	0.61	0.61		0.61	0.61			0.27		0.27	0.27	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	328	1118		551	1126			414		381	444	
v/s Ratio Prot		0.21			c0.37						0.03	
v/s Ratio Perm	0.12			0.06				c0.03		0.02		
v/c Ratio	0.20	0.34		0.09	0.60			0.12		0.06	0.12	
Uniform Delay, d1	5.9	6.6		5.5	8.2			19.2		18.9	19.2	
Progression Factor	0.28	0.25		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	1.2	0.8		0.3	2.3			0.6		0.3	0.5	
Delay (s)	2.8	2.4		5.8	10.6			19.8		19.2	19.7	
Level of Service	A	A		A	B			B		B	B	
Approach Delay (s)		2.5			10.3			19.8			19.6	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	258	85	25	621	60	23	6	36	29	8	24
Future Volume (Veh/h)	20	258	85	25	621	60	23	6	36	29	8	24
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	280	92	27	675	65	25	7	39	32	9	26
Pedestrians		6			15			4			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		315			340							
pX, platoon unblocked	0.75						0.75	0.75		0.75	0.75	0.75
vC, conflicting volume	748			376			1140	1176	205	978	1157	689
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	499			376			1020	1069	205	806	1043	420
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			98			79	95	95	82	94	94
cM capacity (veh/h)	791			1175			122	155	787	176	161	431

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	162	232	702	65	71	67
Volume Left	22	0	27	0	25	32
Volume Right	0	92	0	65	39	26
cSH	791	1700	1175	1700	237	225
Volume to Capacity	0.03	0.14	0.02	0.04	0.30	0.30
Queue Length 95th (ft)	2	0	2	0	30	30
Control Delay (s)	1.6	0.0	0.6	0.0	26.6	27.7
Lane LOS	A		A		D	D
Approach Delay (s)	0.6		0.6		26.6	27.7
Approach LOS					D	D

Intersection Summary				
Average Delay	3.4			
Intersection Capacity Utilization	63.4%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	180	81	47	414	21	122	387	18	80	1078	170
Future Volume (vph)	62	180	81	47	414	21	122	387	18	80	1078	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	4.5		4.0	4.5	
Lane Util. Factor		0.95			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.99		1.00	0.99		1.00	0.98	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3352			1839		1770	3510		1770	3435	
Flt Permitted		0.69			0.93		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2337			1715		1770	3510		1770	3435	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	196	88	51	450	23	133	421	20	87	1172	185
RTOR Reduction (vph)	0	42	0	0	2	0	0	4	0	0	15	0
Lane Group Flow (vph)	0	309	0	0	522	0	133	437	0	87	1342	0
Confl. Peds. (#/hr)	25		6	6		25	20		13	13		20
Confl. Bikes (#/hr)			4			11			1			5
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		26.2			26.2		9.4	33.1		7.2	30.9	
Effective Green, g (s)		26.2			26.2		9.4	33.1		7.2	30.9	
Actuated g/C Ratio		0.33			0.33		0.12	0.41		0.09	0.39	
Clearance Time (s)		5.0			5.0		4.0	4.5		4.0	4.5	
Vehicle Extension (s)		2.0			2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		765			561		207	1452		159	1326	
v/s Ratio Prot							c0.08	0.12		0.05	c0.39	
v/s Ratio Perm		0.13			c0.30							
v/c Ratio		0.40			0.93		0.64	0.30		0.55	1.01	
Uniform Delay, d1		20.9			26.0		33.7	15.7		34.8	24.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			22.0		5.0	0.5		2.1	27.8	
Delay (s)		21.0			48.0		38.7	16.2		36.9	52.3	
Level of Service		C			D		D	B		D	D	
Approach Delay (s)		21.0			48.0			21.4			51.4	
Approach LOS		C			D			C			D	

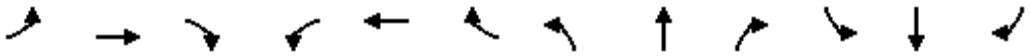
Intersection Summary			
HCM 2000 Control Delay	41.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	95.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	45	11	55	3	12	459
Future Volume (vph)	45	11	55	3	12	459
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	12	60	3	13	499

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	61	63	512
Volume Left (vph)	49	0	13
Volume Right (vph)	12	3	0
Hadj (s)	0.08	0.01	0.04
Departure Headway (s)	5.2	4.6	4.2
Degree Utilization, x	0.09	0.08	0.59
Capacity (veh/h)	618	749	844
Control Delay (s)	8.8	8.0	13.1
Approach Delay (s)	8.8	8.0	13.1
Approach LOS	A	A	B

Intersection Summary			
Delay	12.2		
Level of Service	B		
Intersection Capacity Utilization	41.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	14	1	0	0	0	0	32	35	0	0	0	24
Future Volume (vph)	14	1	0	0	0	0	32	35	0	0	0	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	1	0	0	0	0	35	38	0	0	0	26

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	16	0	35	38	26
Volume Left (vph)	15	0	35	0	0
Volume Right (vph)	0	0	0	0	26
Hadj (s)	0.22	0.00	0.53	0.03	-0.57
Departure Headway (s)	4.3	4.1	5.1	4.6	3.5
Degree Utilization, x	0.02	0.00	0.05	0.05	0.03
Capacity (veh/h)	806	900	695	771	1002
Control Delay (s)	7.4	7.1	7.2	6.6	6.6
Approach Delay (s)	7.4	0.0	6.9		6.6
Approach LOS	A	A	A		A

Intersection Summary				
Delay	6.9			
Level of Service	A			
Intersection Capacity Utilization	20.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection: 1: Frontage Rd & Gilman St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	R	LT	TR	LTR	LTR
Maximum Queue (ft)	21	22	80	52	77	31
Average Queue (ft)	1	1	54	2	40	12
95th Queue (ft)	7	10	82	17	61	36
Link Distance (ft)	433	433	60	60	215	224
Upstream Blk Time (%)			2	0		
Queuing Penalty (veh)			11	0		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Gilman St & WB I-80 Ramps

Movement	EB	EB	WB	WB	SB	SB	B48
Directions Served	T	TR	LT	T	L	LTR	T
Maximum Queue (ft)	37	30	116	50	583	634	614
Average Queue (ft)	6	3	40	2	507	595	567
95th Queue (ft)	24	17	93	17	610	617	667
Link Distance (ft)	60	60	196	196	514	514	551
Upstream Blk Time (%)					2	89	84
Queuing Penalty (veh)					0	0	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 3: EB I-80 Ramps & Gilman St

Movement	EB	WB	WB	NB	NB
Directions Served	LT	T	TR	LT	TR
Maximum Queue (ft)	74	31	92	71	173
Average Queue (ft)	31	1	5	21	86
95th Queue (ft)	70	10	35	50	132
Link Distance (ft)	196	14	14	356	356
Upstream Blk Time (%)		0	0		
Queuing Penalty (veh)		0	1		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: Eastshore Hwy & Gilman St

Movement	EB	EB	WB	WB	NB	NB	SB	B40	B36
Directions Served	LT	TR	LT	TR	LT	TR	LTR	T	T
Maximum Queue (ft)	30	31	137	92	117	29	179	168	345
Average Queue (ft)	27	7	13	4	36	18	160	145	317
95th Queue (ft)	41	27	67	31	82	40	177	192	438
Link Distance (ft)	14	14	113	113	130	130	85	72	331
Upstream Blk Time (%)	6	0	1		0		97	96	56
Queuing Penalty (veh)	29	2	2		0		491	482	282
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 5: Second St & Gilman St

Movement	EB	B43	WB	NB
Directions Served	LT	T	LT	LTR
Maximum Queue (ft)	83	113	25	23
Average Queue (ft)	22	7	2	11
95th Queue (ft)	71	44	11	29
Link Distance (ft)	12	113	616	621
Upstream Blk Time (%)	3	0		
Queuing Penalty (veh)	12	1		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: 4th St & Gilman St

Movement	EB	EB	WB	NB	SB
Directions Served	LT	R	LT	LTR	LTR
Maximum Queue (ft)	228	95	267	64	56
Average Queue (ft)	81	27	137	24	30
95th Queue (ft)	155	71	249	55	58
Link Distance (ft)	616		260	568	627
Upstream Blk Time (%)			1		
Queuing Penalty (veh)			6		
Storage Bay Dist (ft)		70			
Storage Blk Time (%)	7	0	14		
Queuing Penalty (veh)	7	0	0		

Intersection: 7: 6th St & Gilman St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	251	165	105	290	112	180	89	187
Average Queue (ft)	36	110	74	211	64	39	7	106
95th Queue (ft)	142	173	127	297	104	102	38	173
Link Distance (ft)	259			275		636		585
Upstream Blk Time (%)	0			2				
Queuing Penalty (veh)	0			12				
Storage Bay Dist (ft)		140	80		90		65	
Storage Blk Time (%)		4	2	29	3	0		17
Queuing Penalty (veh)		1	11	22	2	0		3

Intersection: 8: 8th St & Gilman St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	LTR	LTR
Maximum Queue (ft)	74	99	89	276	53	184
Average Queue (ft)	21	42	19	128	11	71
95th Queue (ft)	54	92	64	217	38	130
Link Distance (ft)		235		289	638	424
Upstream Blk Time (%)				0		
Queuing Penalty (veh)				0		
Storage Bay Dist (ft)	50		65			
Storage Blk Time (%)	4	4	0	16		
Queuing Penalty (veh)	21	1	0	4		

Intersection: 9: 9th St & Gilman St

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	L	TR
Maximum Queue (ft)	85	72	100	265	96	53	111
Average Queue (ft)	31	20	38	132	34	17	41
95th Queue (ft)	70	52	93	242	77	44	81
Link Distance (ft)		289		253	599		398
Upstream Blk Time (%)				1			
Queuing Penalty (veh)				6			
Storage Bay Dist (ft)	80		75			90	
Storage Blk Time (%)	0	0		13			1
Queuing Penalty (veh)	1	0		6			0

Intersection: 10: 10th St & Gilman St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	R	LTR	LTR
Maximum Queue (ft)	55	72	165	97	75	46
Average Queue (ft)	13	7	31	5	38	25
95th Queue (ft)	44	38	96	35	65	49
Link Distance (ft)	253		265		656	393
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		50		75		
Storage Blk Time (%)	1	0	1	0		
Queuing Penalty (veh)	3	0	1	0		

Intersection: 11: San Pablo Ave & Gilman St

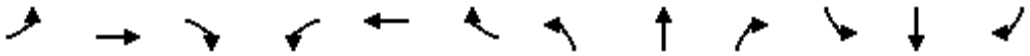
Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	162	96	437	154	139	94	175	471	427
Average Queue (ft)	61	50	230	76	90	48	98	280	253
95th Queue (ft)	110	95	400	128	137	88	195	417	397
Link Distance (ft)	265	265	515		833	833		698	698
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)				160			150		
Storage Blk Time (%)				0			0	33	
Queuing Penalty (veh)				1			0	26	

Intersection: 12: Harrison St & Eastshore Hwy

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	114	50	334
Average Queue (ft)	37	26	290
95th Queue (ft)	82	47	407
Link Distance (ft)	196	331	295
Upstream Blk Time (%)			83
Queuing Penalty (veh)			0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: Harrison St & Second St

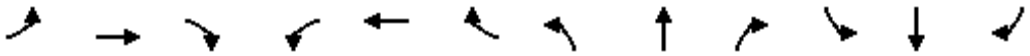
Movement	EB	NB	NB	SB
Directions Served	LT	L	TR	LTR
Maximum Queue (ft)	24	31	49	30
Average Queue (ft)	5	17	22	15
95th Queue (ft)	21	42	47	40
Link Distance (ft)	196	98	98	149
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	201	21	335	188	21	13	0	486	11	4	4
Future Volume (Veh/h)	1	201	21	335	188	21	13	0	486	11	4	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	218	23	364	204	23	14	0	528	12	4	4
Pedestrians		2						4			4	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		3.5						3.5			3.5	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	231			245			1062	1183	222	1696	1194	120
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	231			245			1062	1183	222	1696	1194	120
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			72			90	100	32	20	97	100
cM capacity (veh/h)	1329			1313			134	135	779	15	133	904

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	219	23	466	125	542	20
Volume Left	1	0	364	0	14	12
Volume Right	0	23	0	23	528	4
cSH	1329	1700	1313	1700	693	24
Volume to Capacity	0.00	0.01	0.28	0.07	0.78	0.83
Queue Length 95th (ft)	0	0	28	0	192	62
Control Delay (s)	0.0	0.0	7.4	0.0	26.2	356.6
Lane LOS	A		A		D	F
Approach Delay (s)	0.0		5.9		26.2	356.6
Approach LOS					D	F

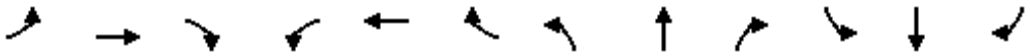
Intersection Summary			
Average Delay	17.8		
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	667	31	203	183	0	0	0	0	468	48	361
Future Volume (Veh/h)	0	667	31	203	183	0	0	0	0	468	48	361
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	725	34	221	199	0	0	0	0	509	52	392
Pedestrians											14	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					1250							
pX, platoon unblocked												
vC, conflicting volume	213			759			1702	1397	380	1018	1414	114
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	213			759			1702	1397	380	1018	1414	114
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			74			100	100	100	0	48	57
cM capacity (veh/h)	1336			848			16	102	618	150	100	905

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	483	276	287	133	339	614
Volume Left	0	0	221	0	339	170
Volume Right	0	34	0	0	0	392
cSH	1700	1700	848	1700	150	294
Volume to Capacity	0.28	0.16	0.26	0.08	2.27	2.09
Queue Length 95th (ft)	0	0	26	0	706	1127
Control Delay (s)	0.0	0.0	8.9	0.0	640.0	529.9
Lane LOS			A		F	F
Approach Delay (s)	0.0		6.1		569.1	
Approach LOS					F	

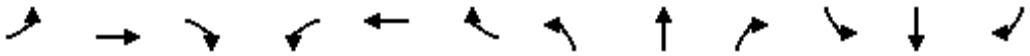
Intersection Summary				
Average Delay	255.6			
Intersection Capacity Utilization	66.7%	ICU Level of Service		C
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	497	638	0	0	369	839	17	0	111	0	0	0
Future Volume (Veh/h)	497	638	0	0	369	839	17	0	111	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	540	693	0	0	401	912	18	0	121	0	0	0
Pedestrians								12			19	
Lane Width (ft)								12.0			0.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					1018							
pX, platoon unblocked												
vC, conflicting volume	1332			705			1986	3117	358	2424	2661	676
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1332			705			1986	3117	358	2424	2661	676
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	0			100			0	0	81	0	0	100
cM capacity (veh/h)	514			879			0	0	631	0	0	396

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	771	462	267	1046	18	121
Volume Left	540	0	0	0	18	0
Volume Right	0	0	0	912	0	121
cSH	514	1700	1700	1700	0	631
Volume to Capacity	1.05	0.27	0.16	0.62	Err	0.19
Queue Length 95th (ft)	399	0	0	0	Err	18
Control Delay (s)	82.1	0.0	0.0	0.0	Err	12.1
Lane LOS	F				F	B
Approach Delay (s)	51.3		0.0		Err	
Approach LOS					F	

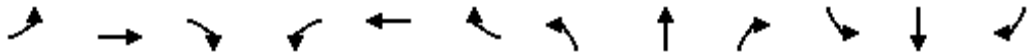
Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	84.7%	ICU Level of Service	E	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	586	81	2	960	86	141	38	50	27	12	107
Future Volume (Veh/h)	82	586	81	2	960	86	141	38	50	27	12	107
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	89	637	88	2	1043	93	153	41	54	29	13	116
Pedestrians					5			8			11	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					3.5			3.5			3.5	
Percent Blockage					0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					934							
pX, platoon unblocked												
vC, conflicting volume	1147			733			1515	2018	376	1680	2016	579
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1147			733			1515	2018	376	1680	2016	579
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	85			100			0	15	91	0	73	74
cM capacity (veh/h)	599			861			42	48	614	14	48	454

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	408	406	524	614	174	74	158
Volume Left	89	0	2	0	153	0	29
Volume Right	0	88	0	93	0	54	116
cSH	599	1700	861	1700	43	145	61
Volume to Capacity	0.15	0.24	0.00	0.36	4.05	0.51	2.61
Queue Length 95th (ft)	13	0	0	0	Err	62	398
Control Delay (s)	4.4	0.0	0.1	0.0	Err	53.6	874.6
Lane LOS	A		A		F	F	F
Approach Delay (s)	2.2		0.0		7011.4		874.6
Approach LOS					F		F

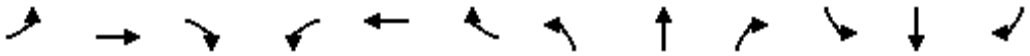
Intersection Summary				
Average Delay	796.8			
Intersection Capacity Utilization	76.1%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	627	6	2	1019	59	29	3	4	0	0	0
Future Volume (Veh/h)	30	627	6	2	1019	59	29	3	4	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	682	7	2	1108	64	32	3	4	0	0	0
Pedestrians		2			2			5			7	
Lane Width (ft)		12.0			12.0			12.0			0.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					686							
pX, platoon unblocked												
vC, conflicting volume	1179			694			1313	1936	689	1906	1911	595
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1179			694			1313	1936	689	1906	1911	595
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			71	95	99	100	100	100
cM capacity (veh/h)	588			893			110	61	386	38	63	447

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	715	7	556	618	39
Volume Left	33	0	2	0	32
Volume Right	0	7	0	64	4
cSH	588	1700	893	1700	111
Volume to Capacity	0.06	0.00	0.00	0.36	0.35
Queue Length 95th (ft)	4	0	0	0	35
Control Delay (s)	1.6	0.0	0.1	0.0	54.0
Lane LOS	A		A		F
Approach Delay (s)	1.5		0.0		54.0
Approach LOS					F

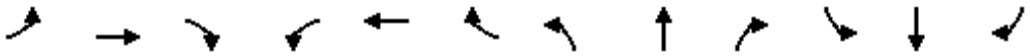
Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	73.1%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	570	42	31	1025	47	43	1	48	2	3	12
Future Volume (vph)	19	570	42	31	1025	47	43	1	48	2	3	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5		4.5			4.5	
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.96		1.00	0.97		0.98			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.93			0.90	
Flt Protected		1.00	1.00		1.00	1.00		0.98			0.99	
Satd. Flow (prot)		1860	1526		1860	1539		1657			1669	
Flt Permitted		0.95	1.00		0.97	1.00		0.84			0.96	
Satd. Flow (perm)		1778	1526		1814	1539		1426			1618	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	620	46	34	1114	51	47	1	52	2	3	13
RTOR Reduction (vph)	0	0	9	0	0	6	0	45	0	0	11	0
Lane Group Flow (vph)	0	641	37	0	1148	45	0	55	0	0	7	0
Confl. Peds. (#/hr)	3		8	8		3			11	11		
Confl. Bikes (#/hr)			3			5						
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		49.5	49.5		49.5	49.5		8.4			8.4	
Effective Green, g (s)		49.5	49.5		49.5	49.5		8.4			8.4	
Actuated g/C Ratio		0.74	0.74		0.74	0.74		0.13			0.13	
Clearance Time (s)		4.5	4.5		4.5	4.5		4.5			4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		1315	1129		1342	1138		179			203	
v/s Ratio Prot												
v/s Ratio Perm		0.36	0.02		c0.63	0.03		c0.04			0.00	
v/c Ratio		0.49	0.03		0.86	0.04		0.30			0.03	
Uniform Delay, d1		3.5	2.3		6.2	2.3		26.6			25.7	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		0.3	0.0		5.6	0.0		1.0			0.1	
Delay (s)		3.8	2.3		11.7	2.3		27.6			25.7	
Level of Service		A	A		B	A		C			C	
Approach Delay (s)		3.7			11.3			27.6			25.7	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	66.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	99.8%	ICU Level of Service	F
Analysis Period (min)	15		

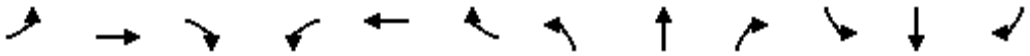
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	507	78	65	611	25	460	53	112	10	77	32
Future Volume (vph)	35	507	78	65	611	25	460	53	112	10	77	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.90		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1815		1770	1846		1754	1638		1756	1764	
Flt Permitted	0.17	1.00		0.21	1.00		0.68	1.00		0.62	1.00	
Satd. Flow (perm)	310	1815		393	1846		1256	1638		1151	1764	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	551	85	71	664	27	500	58	122	11	84	35
RTOR Reduction (vph)	0	7	0	0	2	0	0	70	0	0	18	0
Lane Group Flow (vph)	38	629	0	71	689	0	500	110	0	11	101	0
Confl. Peds. (#/hr)	28		10	10		28	5		5	5		5
Confl. Bikes (#/hr)			4			5			1			2
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	37.9	37.9		37.9	37.9		34.1	34.1		34.1	34.1	
Effective Green, g (s)	37.9	37.9		37.9	37.9		34.1	34.1		34.1	34.1	
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.43	0.43		0.43	0.43	
Clearance Time (s)	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	
Lane Grp Cap (vph)	146	859		186	874		535	698		490	751	
v/s Ratio Prot		0.35			c0.37			0.07			0.06	
v/s Ratio Perm	0.12			0.18			c0.40			0.01		
v/c Ratio	0.26	0.73		0.38	0.79		0.93	0.16		0.02	0.13	
Uniform Delay, d1	12.6	17.0		13.5	17.7		21.9	14.1		13.3	14.0	
Progression Factor	1.00	1.00		0.84	0.82		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.3	5.5		4.8	5.9		23.7	0.1		0.0	0.1	
Delay (s)	16.9	22.4		16.2	20.4		45.5	14.2		13.3	14.0	
Level of Service	B	C		B	C		D	B		B	B	
Approach Delay (s)		22.1			20.0			37.3			14.0	
Approach LOS		C			B			D			B	

Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
Analysis Period (min)	15		

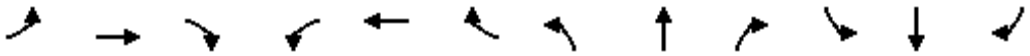
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	569	35	5	639	35	32	88	29	27	37	30
Future Volume (vph)	25	569	35	5	639	35	32	88	29	27	37	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	0.98	1.00		0.99	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.97			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1741	1840		1750	1839			1775			1728	
Flt Permitted	0.28	1.00		0.33	1.00			0.92			0.89	
Satd. Flow (perm)	514	1840		600	1839			1659			1568	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	618	38	5	695	38	35	96	32	29	40	33
RTOR Reduction (vph)	0	3	0	0	2	0	0	11	0	0	21	0
Lane Group Flow (vph)	27	653	0	5	731	0	0	152	0	0	81	0
Confl. Peds. (#/hr)	35		19	19		35	6		9	9		6
Confl. Bikes (#/hr)			7			6			4			4
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	53.0	53.0		53.0	53.0			19.0			19.0	
Effective Green, g (s)	53.0	53.0		53.0	53.0			19.0			19.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.24			0.24	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	340	1219		397	1218			394			372	
v/s Ratio Prot		0.36			c0.40							
v/s Ratio Perm	0.05			0.01				c0.09			0.05	
v/c Ratio	0.08	0.54		0.01	0.60			0.39			0.22	
Uniform Delay, d1	4.8	7.1		4.6	7.6			25.6			24.5	
Progression Factor	0.44	0.34		0.42	0.48			1.00			1.00	
Incremental Delay, d2	0.4	1.3		0.1	1.9			2.9			1.3	
Delay (s)	2.5	3.8		2.0	5.5			28.5			25.9	
Level of Service	A	A		A	A			C			C	
Approach Delay (s)		3.7			5.5			28.5			25.9	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		

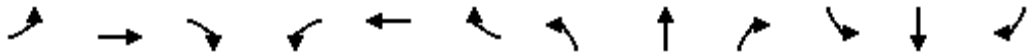
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	514	27	40	584	17	35	35	58	48	20	60
Future Volume (vph)	84	514	27	40	584	17	35	35	58	48	20	60
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	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.95		1.00	0.96	
Flpb, ped/bikes	0.98	1.00		0.99	1.00			0.99		0.94	1.00	
Frt	1.00	0.99		1.00	1.00			0.94		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1727	1844		1753	1850			1629		1670	1580	
Flt Permitted	0.33	1.00		0.37	1.00			0.91		0.63	1.00	
Satd. Flow (perm)	595	1844		677	1850			1500		1107	1580	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	91	559	29	43	635	18	38	38	63	52	22	65
RTOR Reduction (vph)	0	2	0	0	1	0	0	37	0	0	50	0
Lane Group Flow (vph)	91	586	0	43	652	0	0	102	0	52	37	0
Confl. Peds. (#/hr)	40		13	13		40	14		37	37		14
Confl. Bikes (#/hr)			7			4			8			7
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	53.0	53.0		53.0	53.0			19.0		19.0	19.0	
Effective Green, g (s)	53.0	53.0		53.0	53.0			19.0		19.0	19.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.24		0.24	0.24	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	394	1221		448	1225			356		262	375	
v/s Ratio Prot		0.32			c0.35						0.02	
v/s Ratio Perm	0.15			0.06				c0.07		0.05		
v/c Ratio	0.23	0.48		0.10	0.53			0.29		0.20	0.10	
Uniform Delay, d1	5.4	6.7		4.9	7.0			24.9		24.4	23.8	
Progression Factor	0.97	0.76		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	1.2	1.2		0.4	1.7			2.0		1.7	0.5	
Delay (s)	6.4	6.2		5.3	8.7			27.0		26.1	24.4	
Level of Service	A	A		A	A			C		C	C	
Approach Delay (s)		6.2			8.5			27.0			25.0	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		

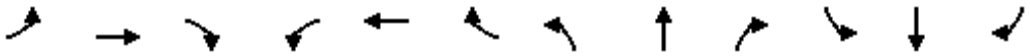
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	569	27	10	554	51	49	5	86	26	18	38
Future Volume (Veh/h)	24	569	27	10	554	51	49	5	86	26	18	38
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	618	29	11	602	55	53	5	93	28	20	41
Pedestrians		10			17			9			14	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		1			2			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		315			340							
pX, platoon unblocked	0.82						0.82	0.82		0.82	0.82	0.82
vC, conflicting volume	671			656			1378	1386	350	1112	1346	626
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	486			656			1351	1361	350	1025	1312	430
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			20	96	85	76	83	91
cM capacity (veh/h)	866			919			66	113	631	118	121	458

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	335	338	613	55	151	89
Volume Left	26	0	11	0	53	28
Volume Right	0	29	0	55	93	41
cSH	866	1700	919	1700	152	181
Volume to Capacity	0.03	0.20	0.01	0.03	0.99	0.49
Queue Length 95th (ft)	2	0	1	0	187	60
Control Delay (s)	1.0	0.0	0.3	0.0	130.2	42.9
Lane LOS	A		A		F	E
Approach Delay (s)	0.5		0.3		130.2	42.9
Approach LOS					F	E

Intersection Summary			
Average Delay	15.2		
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	367	140	39	310	73	197	1009	33	143	890	108
Future Volume (vph)	174	367	140	39	310	73	197	1009	33	143	890	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	4.5		4.0	4.5	
Lane Util. Factor		0.95			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.98		1.00	1.00		1.00	0.98	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3341			1792		1770	3518		1770	3437	
Flt Permitted		0.62			0.80		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2102			1433		1770	3518		1770	3437	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	189	399	152	42	337	79	214	1097	36	155	967	117
RTOR Reduction (vph)	0	25	0	0	8	0	0	3	0	0	10	0
Lane Group Flow (vph)	0	715	0	0	450	0	214	1130	0	155	1074	0
Confl. Peds. (#/hr)	45		28	28		45	37		15	15		37
Confl. Bikes (#/hr)			8			3			6			9
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		31.4			31.4		14.2	33.6		11.5	30.9	
Effective Green, g (s)		31.4			31.4		14.2	33.6		11.5	30.9	
Actuated g/C Ratio		0.35			0.35		0.16	0.37		0.13	0.34	
Clearance Time (s)		5.0			5.0		4.0	4.5		4.0	4.5	
Vehicle Extension (s)		2.0			2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		733			499		279	1313		226	1180	
v/s Ratio Prot							c0.12	c0.32		0.09	0.31	
v/s Ratio Perm		c0.34			0.31							
v/c Ratio		0.97			0.90		0.77	0.86		0.69	0.91	
Uniform Delay, d1		28.9			27.8		36.3	26.0		37.5	28.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		26.8			18.9		10.8	7.6		6.7	11.9	
Delay (s)		55.7			46.7		47.1	33.6		44.2	40.2	
Level of Service		E			D		D	C		D	D	
Approach Delay (s)		55.7			46.7			35.8			40.7	
Approach LOS		E			D			D			D	

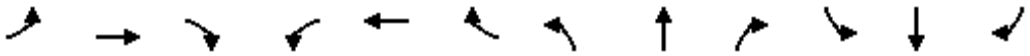
Intersection Summary			
HCM 2000 Control Delay	42.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	99.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	39	38	204	2	2	107
Future Volume (vph)	39	38	204	2	2	107
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	41	222	2	2	116

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	83	224	118
Volume Left (vph)	42	0	2
Volume Right (vph)	41	2	0
Hadj (s)	-0.16	0.03	0.04
Departure Headway (s)	4.5	4.3	4.4
Degree Utilization, x	0.10	0.26	0.14
Capacity (veh/h)	737	823	791
Control Delay (s)	8.0	8.8	8.1
Approach Delay (s)	8.0	8.8	8.1
Approach LOS	A	A	A

Intersection Summary			
Delay	8.4		
Level of Service	A		
Intersection Capacity Utilization	22.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	0	0	0	0	0	55	37	0	0	0	22
Future Volume (vph)	4	0	0	0	0	0	55	37	0	0	0	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	0	0	0	0	0	60	40	0	0	0	24

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	4	0	60	40	24
Volume Left (vph)	4	0	60	0	0
Volume Right (vph)	0	0	0	0	24
Hadj (s)	0.23	0.00	0.53	0.03	-0.57
Departure Headway (s)	4.4	4.2	5.1	4.6	3.5
Degree Utilization, x	0.00	0.00	0.08	0.05	0.02
Capacity (veh/h)	790	900	701	777	1005
Control Delay (s)	7.4	7.2	7.3	6.6	6.6
Approach Delay (s)	7.4	0.0	7.0		6.6
Approach LOS	A	A	A		A

Intersection Summary				
Delay	7.0			
Level of Service	A			
Intersection Capacity Utilization	19.8%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection: 1: Frontage Rd & Gilman St

Movement	EB	WB	NB	SB
Directions Served	LT	LT	LTR	LTR
Maximum Queue (ft)	73	71	230	52
Average Queue (ft)	12	31	149	13
95th Queue (ft)	46	64	256	39
Link Distance (ft)	433	60	215	224
Upstream Blk Time (%)		1	9	
Queuing Penalty (veh)		2	0	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Gilman St & WB I-80 Ramps

Movement	EB	EB	WB	SB	SB
Directions Served	T	TR	LT	L	LTR
Maximum Queue (ft)	93	77	113	420	446
Average Queue (ft)	58	37	54	395	388
95th Queue (ft)	98	84	92	463	537
Link Distance (ft)	60	60	195	395	395
Upstream Blk Time (%)	15	5		79	68
Queuing Penalty (veh)	53	16		347	299
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: EB I-80 Ramps & Gilman St

Movement	EB	WB	WB	NB	NB
Directions Served	LT	T	TR	LT	TR
Maximum Queue (ft)	245	32	31	52	123
Average Queue (ft)	186	6	11	14	56
95th Queue (ft)	261	26	35	41	102
Link Distance (ft)	195	14	14	382	382
Upstream Blk Time (%)	18	0	1		
Queuing Penalty (veh)	101	1	7		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: Eastshore Hwy & Gilman St

Movement	EB	EB	WB	WB	NB	NB	SB	B40	B36
Directions Served	LT	TR	LT	TR	LT	TR	LTR	T	T
Maximum Queue (ft)	54	22	25	123	146	165	174	164	344
Average Queue (ft)	32	1	2	19	134	63	152	140	305
95th Queue (ft)	48	7	12	69	152	173	172	185	457
Link Distance (ft)	14	14	113	113	130	130	85	72	331
Upstream Blk Time (%)	29	0		0	97	33	97	95	64
Queuing Penalty (veh)	110	0		0	0	0	142	139	93
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 5: Second St & Gilman St

Movement	EB	B43	WB	WB	NB
Directions Served	LT	T	LT	TR	LTR
Maximum Queue (ft)	83	150	48	97	90
Average Queue (ft)	36	23	4	7	23
95th Queue (ft)	95	91	22	39	57
Link Distance (ft)	12	113	616	616	621
Upstream Blk Time (%)	9	2			
Queuing Penalty (veh)	30	5			
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: 4th St & Gilman St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	R	LT	R	LTR	LTR
Maximum Queue (ft)	219	95	272	100	87	31
Average Queue (ft)	100	8	157	34	33	11
95th Queue (ft)	193	40	258	105	74	34
Link Distance (ft)	616		270		568	626
Upstream Blk Time (%)			0			
Queuing Penalty (veh)			3			
Storage Bay Dist (ft)		70		75		
Storage Blk Time (%)	10		15	0		
Queuing Penalty (veh)	4		7	0		

Intersection: 7: 6th St & Gilman St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	250	165	104	268	114	651	30	95
Average Queue (ft)	93	128	37	188	108	267	4	41
95th Queue (ft)	252	198	95	290	133	492	20	83
Link Distance (ft)	248			250		636		585
Upstream Blk Time (%)	1			6		1		
Queuing Penalty (veh)	5			41		0		
Storage Bay Dist (ft)		140	80		90		65	
Storage Blk Time (%)	0	9	0	31	43	2		3
Queuing Penalty (veh)	0	3	1	20	71	8		0

Intersection: 8: 8th St & Gilman St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	LTR	LTR
Maximum Queue (ft)	32	214	31	114	173	97
Average Queue (ft)	11	39	3	44	89	50
95th Queue (ft)	35	114	18	93	152	90
Link Distance (ft)		260		289	638	424
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	50		65			
Storage Blk Time (%)	0	4		3		
Queuing Penalty (veh)	0	1		0		

Intersection: 9: 9th St & Gilman St

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	L	TR
Maximum Queue (ft)	100	160	100	263	144	74	126
Average Queue (ft)	42	68	21	96	64	35	38
95th Queue (ft)	90	138	63	192	116	63	79
Link Distance (ft)		289		253	599		398
Upstream Blk Time (%)				0			
Queuing Penalty (veh)				1			
Storage Bay Dist (ft)	80		75			90	
Storage Blk Time (%)	1	6	0	10		0	0
Queuing Penalty (veh)	6	5	0	4		0	0

Intersection: 10: 10th St & Gilman St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	R	LTR	LTR
Maximum Queue (ft)	153	75	174	100	116	65
Average Queue (ft)	23	7	25	7	59	32
95th Queue (ft)	86	38	91	40	96	59
Link Distance (ft)	253		265		656	393
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		50		75		
Storage Blk Time (%)	1	0	1			
Queuing Penalty (veh)	4	1	0			

Intersection: 11: San Pablo Ave & Gilman St

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	266	252	530	185	504	426	175	438	388
Average Queue (ft)	138	130	303	155	284	236	124	252	227
95th Queue (ft)	232	219	547	212	452	386	210	369	345
Link Distance (ft)	265	265	515		833	833		698	698
Upstream Blk Time (%)	1	0	7						
Queuing Penalty (veh)	3	0	0						
Storage Bay Dist (ft)				160			150		
Storage Blk Time (%)				7	24		2	29	
Queuing Penalty (veh)				36	47		7	42	

Intersection: 12: Harrison St & Eastshore Hwy

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	182	72	310
Average Queue (ft)	71	38	191
95th Queue (ft)	142	58	397
Link Distance (ft)	196	331	295
Upstream Blk Time (%)	0		51
Queuing Penalty (veh)	0		0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: Harrison St & Second St

Movement	EB	NB	NB	SB
Directions Served	LT	L	TR	LTR
Maximum Queue (ft)	24	54	30	31
Average Queue (ft)	4	28	18	16
95th Queue (ft)	18	48	42	41
Link Distance (ft)	196	98	98	149
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

2040 No Build Conditions

2040 Intersection Level-of-Services

				2040 AM Peak Hour						2040 PM Peak Hour					
ID	**Intersection**	**Control Type**	**Approach**	**No Build**			**Build**			**No Build**			**Build**		
				Delay [a]	**LOS [b]**	**V/C[e]**	**Delay [a]**	**LOS [b]**	**V/C**	**Delay**	**LOS [b]**	**V/C[e]**	**Delay**	**LOS [b]**	**V/C**
1	Gilman St. at Frontage Rd.	TWSC [c]	Eastbound	0.9	A	0.0	19.1	B	0.18	0.0	A	0.29	16.7	B	0.5
			Westbound	20.1	C	0.89	n/a	n/a	n/a	7.9	A	0.38	n/a	n/a	n/a
			Northbound	>50.0	**F**	33.56	21.3	C	0.62	23.1	C	0.73	120.2	**F**	1.15
			Southbound	>50.0	**F**	11.22	n/a	n/a	n/a	>50.0	**F**	0.63	n/a	n/a	n/a
2	Gilman St. at WB I-80 Ramps	TWSC [c]	Eastbound	0.0	A	0.10	n/a	n/a	n/a	0.0	A	0.26	n/a	n/a	n/a
			Westbound	3.9	A	0.25	5.5	A	0.37	9.8	B	0.38	4.3	A	0.24
			Southbound	>50.0	**F**	5.82	188.5	**F**	1.38	>50.0	**F**	3.56	9.3	A	0.55
3	Gilman St. at EB I-80 Ramps	TWSC [c]	Eastbound	1.4	A	0.32	10.3	B	0.63	19.0	B	0.85	28.1	C	0.93
			Westbound	0.0	A	0.39	n/a	n/a	n/a	31.4	C	0.89	n/a	n/a	n/a
			Northbound	24.7	C	0.64	22.9	**C**	0.69	51.8	D	0.44	30.1	C	0.67
4	Gilman St. at Eastshore Hwy.	TWSC [c]	Eastbound	0.5	A	0.44	n/a	n/a	n/a	3.0	A	0.31	n/a	n/a	n/a
			Westbound	0.4	A	0.25	5.2	A	0.36	0.1	A	0.41	16.1	B	0.77
			Northbound	>50.0	**F**	n/a	9.1	A	0.13	>50.0	**F**	n/a	21.2	C	0.51
			Southbound	>50.0	**F**	3.95	14.6	B	0.57	>50.0	**F**	n/a	16.8	B	0.36
5	Gilman St. at Second St.	TWSC [c]	Eastbound	1.7	A	0.06	1.7	A	0.06	2.4	A	0.08	2.4	A	0.08
			Westbound	0.2	A	0.26	0.2	A	0.26	0.0	A	0.36	0.0	A	0.36
			Northbound	38.0	E	0.22	38.0	E	0.22	>50.0	**F**	1.44	>50.0	**F**	1.44
6	Gilman St. at 4th St.	TWSC [c]	Eastbound	6.4	A	0.66	6.4	A	0.66	4.9	A	0.68	4.9	A	0.68
			Westbound	8.5	A	0.74	8.5	A	0.74	8.8	A	0.82	8.8	A	0.82
			Northbound	14.9	B	0.17	14.9	B	0.17	31.5	C	0.15	31.5	C	0.15
			Southbound	14.3	B	0.04	14.3	B	0.04	31.1	C	0.09	31.1	C	0.09
7	Gilman St. at 6th St.	Signal	Eastbound	11.3	B	0.63	11.3	B	0.63	46.8	D	1.00	46.8	D	1.00
			Westbound	11.0	B	0.56	11.0	B	0.56	19.1	B	0.78	19.1	B	0.78
			Northbound	24.4	C	0.63	24.4	C	0.63	31.5	C	0.88	31.5	C	0.88
			Southbound	22.7	C	0.56	22.7	C	0.56	16.8	B	0.17	16.8	B	0.17
8	Gilman St. at 8th St.	Signal	Eastbound	8.3	A	0.64	8.3	A	0.64	5.5	A	0.77	5.5	A	0.77
			Westbound	8.8	A	0.68	8.8	A	0.68	5.6	A	0.66	5.6	A	0.66
			Northbound	20.4	C	0.15	20.4	C	0.15	52.7	D	0.87	52.7	D	0.87

ID	Intersection	Control Type	Approach	2040 AM Peak Hour						2040 PM Peak Hour					
				No Build			Build			No Build			Build		
				Delay [a]	LOS [b]	V/C[e]	Delay [a]	LOS [b]	V/C	Delay	LOS [b]	V/C[e]	Delay	LOS [b]	V/C
			Southbound	>80	**F**	1.07	>80	**F**	1.07	30.3	C	0.43	30.3	C	0.43
9	Gilman St. at 9th St.	Signal	Eastbound	4.2	A	0.58	4.2	A	0.58	9.3	A	0.69	9.3	A	0.69
			Westbound	12.4	B	0.7	12.4	B	0.7	9.9	A	0.62	9.9	A	0.62
			Northbound	19.8	B	0.12	19.8	B	0.12	32.7	C	0.55	32.7	C	0.55
			Southbound	19.8	B	0.13	19.8	B	0.13	26.1	C	0.27	26.1	C	0.27
10	Gilman St. at 10th St.	TWSC [c]	Eastbound	0.5	A	0.22	0.5	A	0.22	0.7	A	0.3	0.7	A	0.3
			Westbound	0.7	A	0.05	0.7	A	0.05	0.4	A	0.06	0.4	A	0.06
			Northbound	71.7	F	0.59	71.7	F	0.59	>50.0	**F**	5.26	>50.0	**F**	5.26
			Southbound	52.2	F	0.48	52.2	F	0.48	>50.0	**F**	1.25	>50.0	**F**	1.25
11	Gilman St. at San Pablo Ave.	Signal	Eastbound	22.1	C	0.58	22.1	C	0.58	>80.0	**F**	1.53	>80.0	**F**	1.53
			Westbound	65.6	E	1.01	65.6	E	1.01	>80.0	**F**	1.82	>80.0	**F**	1.82
			Northbound	24.8	C	0.75	24.8	C	0.75	62.0	E	1.03	62.0	E	1.03
			Southbound	>80.0	**F**	1.32	>80.0	**F**	1.32	>80.0	**F**	1.39	>80.0	**F**	1.39
12	Eastshore Hwy. at Harrison St.	AWSC [d]	Westbound	8.9	A	0.11	8.9	A	0.11	8.5	A	0.11	8.5	A	0.11
			Northbound	8.2	A	0.12	8.2	A	0.12	10.4	B	0.44	10.4	B	0.44
			Southbound	13.5	B	0.62	13.5	B	0.62	8.3	A	0.16	8.3	A	0.16
13	Second St. at Harrison St.	AWSC [d]	Eastbound	7.5	A	0.03	7.5	A	0.03	7.4	A	0.01	7.4	A	0.01
			Westbound	7.2	A	0.01	7.2	A	0.01	0.0	A	0.0	0.0	A	0.0
			Northbound	7.2	A	0.08	7.2	A	0.08	6.9	A	0.06	6.9	A	0.06
			Southbound	6.7	A	0.02	6.7	A	0.02	6.6	A	0.04	6.6	A	0.04

Source: TJKM, 2016

Notes:

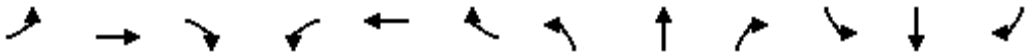
a. Delay in seconds per vehicle. For Signalized and all-way-stop controlled intersections, overall (intersection) delay reported. For two-way stop-control intersections, the worst approach is reported.

b. LOS-Level of Service.

c. TWSC-Two-way-stop-control. Delay and LOS of the worst approach are reported.

d. AWSC-All-way-stop-control.

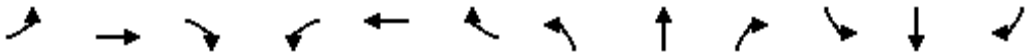
d. If an approach has more than one lane group, the worse lane group v/c was reported.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	23	6	1290	145	15	49	0	251	6	0	2
Future Volume (Veh/h)	4	23	6	1290	145	15	49	0	251	6	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	25	7	1402	158	16	53	0	273	7	0	2
Pedestrians		7									1	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		3.5									3.5	
Percent Blockage		1									0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	175			32			2925	3012	25	3277	3011	95
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	175			32			2925	3012	25	3277	3011	95
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			11			0	100	74	0	100	100
cM capacity (veh/h)	1398			1579			2	1	1045	1	1	936

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	29	7	1481	95	326	9
Volume Left	4	0	1402	0	53	7
Volume Right	0	7	0	16	273	2
cSH	1398	1700	1579	1700	10	1
Volume to Capacity	0.00	0.00	0.89	0.06	33.56	11.22
Queue Length 95th (ft)	0	0	360	0	Err	Err
Control Delay (s)	1.1	0.0	21.3	0.0	Err	Err
Lane LOS	A		C		F	F
Approach Delay (s)	0.9		20.1		Err	Err
Approach LOS					F	F

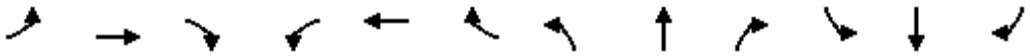
Intersection Summary				
Average Delay	1736.7			
Intersection Capacity Utilization	102.4%	ICU Level of Service	G	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	235	45	287	467	0	0	0	0	567	219	983
Future Volume (Veh/h)	0	235	45	287	467	0	0	0	0	567	219	983
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	255	49	312	508	0	0	0	0	616	238	1068
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					1250							
pX, platoon unblocked												
vC, conflicting volume	508			304			2344	1412	152	1260	1436	254
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	508			304			2344	1412	152	1260	1436	254
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			75			0	100	100	0	0	0
cM capacity (veh/h)	1053			1254			0	103	867	103	99	745

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	170	134	481	339	411	1511
Volume Left	0	0	312	0	411	205
Volume Right	0	49	0	0	0	1068
cSH	1700	1700	1254	1700	103	259
Volume to Capacity	0.10	0.08	0.25	0.20	4.00	5.82
Queue Length 95th (ft)	0	0	25	0	Err	Err
Control Delay (s)	0.0	0.0	6.6	0.0	Err	Err
Lane LOS			A		F	F
Approach Delay (s)	0.0		3.9		9999.0	
Approach LOS					F	

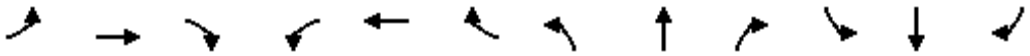
Intersection Summary				
Average Delay	6310.3			
Intersection Capacity Utilization	90.8%	ICU Level of Service		E
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	742	0	0	724	373	30	0	342	0	0	0
Future Volume (Veh/h)	60	742	0	0	724	373	30	0	342	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	807	0	0	787	405	33	0	372	0	0	0
Pedestrians								12			9	
Lane Width (ft)								12.0			0.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					1018							
pX, platoon unblocked												
vC, conflicting volume	1201			819			1342	2150	416	1904	1948	605
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1201			819			1342	2150	416	1904	1948	605
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	89			100			67	100	36	100	100	100
cM capacity (veh/h)	577			796			99	42	579	14	56	441

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	334	538	525	667	33	372
Volume Left	65	0	0	0	33	0
Volume Right	0	0	0	405	0	372
cSH	577	1700	1700	1700	99	579
Volume to Capacity	0.11	0.32	0.31	0.39	0.33	0.64
Queue Length 95th (ft)	9	0	0	0	32	114
Control Delay (s)	3.6	0.0	0.0	0.0	58.7	21.7
Lane LOS	A				F	C
Approach Delay (s)	1.4		0.0		24.7	
Approach LOS					C	

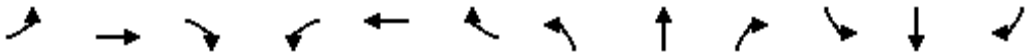
Intersection Summary				
Average Delay	4.5			
Intersection Capacity Utilization	76.5%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	722	330	15	724	36	38	2	24	48	126	335
Future Volume (Veh/h)	32	722	330	15	724	36	38	2	24	48	126	335
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	785	359	16	787	39	41	2	26	52	137	364
Pedestrians					1			8			6	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					3.5			3.5			3.5	
Percent Blockage					0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					934							
pX, platoon unblocked												
vC, conflicting volume	832			1152			1900	1906	581	1335	2066	419
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	832			1152			1900	1906	581	1335	2066	419
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			97			0	97	94	46	0	37
cM capacity (veh/h)	792			598			0	62	453	96	49	580

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	428	752	410	432	42	27	553
Volume Left	35	0	16	0	41	0	52
Volume Right	0	359	0	39	0	26	364
cSH	792	1700	598	1700	0	368	140
Volume to Capacity	0.04	0.44	0.03	0.25	Err	0.07	3.95
Queue Length 95th (ft)	3	0	2	0	Err	6	Err
Control Delay (s)	1.3	0.0	0.8	0.0	Err	15.6	Err
Lane LOS	A		A		F	C	F
Approach Delay (s)	0.5		0.4		Err		Err
Approach LOS					F		F

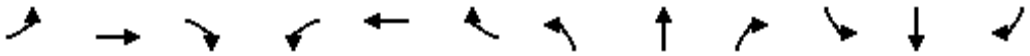
Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	98.2%	ICU Level of Service	F	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	735	13	8	757	34	18	0	10	0	0	0
Future Volume (Veh/h)	46	735	13	8	757	34	18	0	10	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	799	14	9	823	37	20	0	11	0	0	0
Pedestrians								1			4	
Lane Width (ft)								12.0			0.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					686							
pX, platoon unblocked												
vC, conflicting volume	864			814			1330	1782	800	1774	1778	434
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	864			814			1330	1782	800	1774	1778	434
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			99			81	100	97	100	100	100
cM capacity (veh/h)	774			808			106	75	328	48	75	570

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	849	14	420	448	31
Volume Left	50	0	9	0	20
Volume Right	0	14	0	37	11
cSH	774	1700	808	1700	140
Volume to Capacity	0.06	0.01	0.01	0.26	0.22
Queue Length 95th (ft)	5	0	1	0	20
Control Delay (s)	1.7	0.0	0.3	0.0	38.0
Lane LOS	A		A		E
Approach Delay (s)	1.7		0.2		38.0
Approach LOS					E

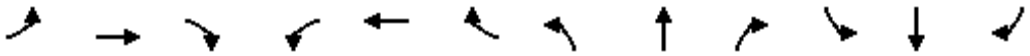
Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	643	82	26	720	3	34	0	21	3	0	45
Future Volume (vph)	20	643	82	26	720	3	34	0	21	3	0	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5		4.5			4.5	
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.97		1.00	0.96		0.99			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.95			0.87	
Flt Protected		1.00	1.00		1.00	1.00		0.97			1.00	
Satd. Flow (prot)		1860	1528		1859	1517		1694			1620	
Flt Permitted		0.97	1.00		0.97	1.00		0.78			0.98	
Satd. Flow (perm)		1808	1528		1804	1517		1365			1595	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	699	89	28	783	3	37	0	23	3	0	49
RTOR Reduction (vph)	0	0	24	0	0	1	0	19	0	0	40	0
Lane Group Flow (vph)	0	721	65	0	811	2	0	41	0	0	12	0
Confl. Peds. (#/hr)	17		10	10		17			8	8		
Confl. Bikes (#/hr)			6			5						
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		25.2	25.2		25.2	25.2		7.3			7.3	
Effective Green, g (s)		25.2	25.2		25.2	25.2		7.3			7.3	
Actuated g/C Ratio		0.61	0.61		0.61	0.61		0.18			0.18	
Clearance Time (s)		4.5	4.5		4.5	4.5		4.5			4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		1097	927		1095	921		240			280	
v/s Ratio Prot												
v/s Ratio Perm		0.40	0.04		c0.45	0.00		c0.03			0.01	
v/c Ratio		0.66	0.07		0.74	0.00		0.17			0.04	
Uniform Delay, d1		5.3	3.3		5.8	3.2		14.5			14.2	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		1.4	0.0		2.7	0.0		0.3			0.1	
Delay (s)		6.8	3.4		8.6	3.2		14.9			14.3	
Level of Service		A	A		A	A		B			B	
Approach Delay (s)		6.4			8.5			14.9			14.3	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	41.5	Sum of lost time (s)	9.0
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		

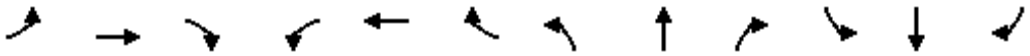
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	517	122	77	552	20	121	33	44	15	197	76
Future Volume (vph)	28	517	122	77	552	20	121	33	44	15	197	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.91		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1749	1801		1768	1849		1748	1673		1761	1761	
Flt Permitted	0.32	1.00		0.27	1.00		0.40	1.00		0.70	1.00	
Satd. Flow (perm)	591	1801		509	1849		744	1673		1302	1761	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	562	133	84	600	22	132	36	48	16	214	83
RTOR Reduction (vph)	0	13	0	0	2	0	0	34	0	0	19	0
Lane Group Flow (vph)	30	682	0	84	620	0	132	50	0	16	278	0
Confl. Peds. (#/hr)	21		2	2		21	12		3	3		12
Confl. Bikes (#/hr)			2			8			4			4
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	42.3	42.3		42.3	42.3		19.7	19.7		19.7	19.7	
Effective Green, g (s)	42.3	42.3		42.3	42.3		19.7	19.7		19.7	19.7	
Actuated g/C Ratio	0.60	0.60		0.60	0.60		0.28	0.28		0.28	0.28	
Clearance Time (s)	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	
Lane Grp Cap (vph)	357	1088		307	1117		209	470		366	495	
v/s Ratio Prot		c0.38			0.34			0.03			0.16	
v/s Ratio Perm	0.05			0.16			c0.18			0.01		
v/c Ratio	0.08	0.63		0.27	0.56		0.63	0.11		0.04	0.56	
Uniform Delay, d1	5.8	8.8		6.6	8.2		22.0	18.6		18.3	21.5	
Progression Factor	1.00	1.00		1.16	1.21		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	2.7		1.4	1.3		6.1	0.1		0.0	1.5	
Delay (s)	6.2	11.6		9.0	11.3		28.1	18.7		18.3	22.9	
Level of Service	A	B		A	B		C	B		B	C	
Approach Delay (s)		11.3			11.0			24.4			22.7	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		

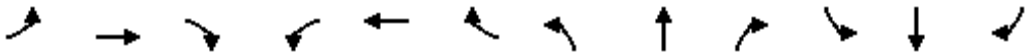
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	587	77	23	615	85	28	10	10	61	243	166
Future Volume (vph)	32	587	77	23	615	85	28	10	10	61	243	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99			0.99			0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	0.98			0.97			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1751	1822		1764	1812			1738			1730	
Flt Permitted	0.24	1.00		0.26	1.00			0.61			0.95	
Satd. Flow (perm)	441	1822		488	1812			1092			1659	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	638	84	25	668	92	30	11	11	66	264	180
RTOR Reduction (vph)	0	7	0	0	7	0	0	8	0	0	28	0
Lane Group Flow (vph)	35	715	0	25	753	0	0	44	0	0	482	0
Confl. Peds. (#/hr)	28		8	8		28	7		11	11		7
Confl. Bikes (#/hr)			4			8			5			10
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	43.0	43.0		43.0	43.0			19.0			19.0	
Effective Green, g (s)	43.0	43.0		43.0	43.0			19.0			19.0	
Actuated g/C Ratio	0.61	0.61		0.61	0.61			0.27			0.27	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	270	1119		299	1113			296			450	
v/s Ratio Prot		0.39			c0.42							
v/s Ratio Perm	0.08			0.05				0.04			c0.29	
v/c Ratio	0.13	0.64		0.08	0.68			0.15			1.07	
Uniform Delay, d1	5.7	8.6		5.5	8.9			19.4			25.5	
Progression Factor	0.59	0.70		1.02	0.71			1.00			1.00	
Incremental Delay, d2	0.9	2.5		0.4	2.5			1.1			62.4	
Delay (s)	4.2	8.5		6.0	8.9			20.4			87.9	
Level of Service	A	A		A	A			C			F	
Approach Delay (s)		8.3			8.8			20.4			87.9	
Approach LOS		A			A			C			F	

Intersection Summary			
HCM 2000 Control Delay	28.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	70.9%	ICU Level of Service	C
Analysis Period (min)	15		

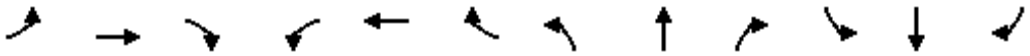
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	518	81	46	631	91	25	16	23	25	35	67
Future Volume (vph)	59	518	81	46	631	91	25	16	23	25	35	67
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	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99			0.97		1.00	0.97	
Flpb, ped/bikes	0.99	1.00		0.99	1.00			1.00		0.96	1.00	
Frt	1.00	0.98		1.00	0.98			0.95		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1751	1815		1760	1809			1683		1705	1636	
Flt Permitted	0.22	1.00		0.31	1.00			0.89		0.78	1.00	
Satd. Flow (perm)	413	1815		570	1809			1520		1407	1636	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	563	88	50	686	99	27	17	25	27	38	73
RTOR Reduction (vph)	0	8	0	0	7	0	0	18	0	0	53	0
Lane Group Flow (vph)	64	643	0	50	778	0	0	51	0	27	58	0
Confl. Peds. (#/hr)	31		10	10		31	7		22	22		7
Confl. Bikes (#/hr)			6			8			12			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	43.0	43.0		43.0	43.0			19.0		19.0	19.0	
Effective Green, g (s)	43.0	43.0		43.0	43.0			19.0		19.0	19.0	
Actuated g/C Ratio	0.61	0.61		0.61	0.61			0.27		0.27	0.27	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	253	1114		350	1111			412		381	444	
v/s Ratio Prot		0.35			c0.43						c0.04	
v/s Ratio Perm	0.16			0.09				0.03		0.02		
v/c Ratio	0.25	0.58		0.14	0.70			0.12		0.07	0.13	
Uniform Delay, d1	6.2	8.1		5.7	9.1			19.2		18.9	19.3	
Progression Factor	0.28	0.32		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	1.8	1.6		0.9	3.7			0.6		0.4	0.6	
Delay (s)	3.5	4.2		6.6	12.8			19.8		19.3	19.9	
Level of Service	A	A		A	B			B		B	B	
Approach Delay (s)		4.2			12.4			19.8			19.8	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		

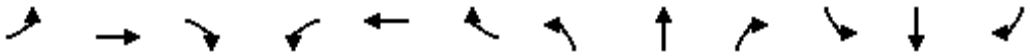
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	408	138	25	721	73	23	6	36	29	8	24
Future Volume (Veh/h)	20	408	138	25	721	73	23	6	36	29	8	24
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	443	150	27	784	79	25	7	39	32	9	26
Pedestrians		6			15			4			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		315			340							
pX, platoon unblocked	0.72						0.72	0.72		0.72	0.72	0.72
vC, conflicting volume	871			597			1440	1491	316	1169	1487	798
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	624			597			1417	1487	316	1039	1482	522
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			97			55	91	94	70	89	93
cM capacity (veh/h)	679			972			56	82	668	108	83	354

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	244	372	811	79	71	67
Volume Left	22	0	27	0	25	32
Volume Right	0	150	0	79	39	26
cSH	679	1700	972	1700	120	140
Volume to Capacity	0.03	0.22	0.03	0.05	0.59	0.48
Queue Length 95th (ft)	3	0	2	0	74	55
Control Delay (s)	1.3	0.0	0.7	0.0	71.7	52.2
Lane LOS	A		A		F	F
Approach Delay (s)	0.5		0.7		71.7	52.2
Approach LOS					F	F

Intersection Summary				
Average Delay	5.8			
Intersection Capacity Utilization	73.2%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	330	81	52	456	23	155	490	23	98	1315	208
Future Volume (vph)	62	330	81	52	456	23	155	490	23	98	1315	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	4.5		4.0	4.5	
Lane Util. Factor		0.95			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.99		1.00	0.99		1.00	0.98	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3411			1839		1770	3511		1770	3434	
Flt Permitted		0.72			0.90		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2482			1666		1770	3511		1770	3434	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	359	88	57	496	25	168	533	25	107	1429	226
RTOR Reduction (vph)	0	22	0	0	2	0	0	4	0	0	15	0
Lane Group Flow (vph)	0	492	0	0	576	0	168	554	0	107	1640	0
Confl. Peds. (#/hr)	25		6	6		25	20		13	13		20
Confl. Bikes (#/hr)			4			11			1			5
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		27.5			27.5		10.1	31.3		7.7	28.9	
Effective Green, g (s)		27.5			27.5		10.1	31.3		7.7	28.9	
Actuated g/C Ratio		0.34			0.34		0.13	0.39		0.10	0.36	
Clearance Time (s)		5.0			5.0		4.0	4.5		4.0	4.5	
Vehicle Extension (s)		2.0			2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		853			572		223	1373		170	1240	
v/s Ratio Prot							c0.09	0.16		0.06	c0.48	
v/s Ratio Perm		0.20			c0.35							
v/c Ratio		0.58			1.01		0.75	0.40		0.63	1.32	
Uniform Delay, d1		21.5			26.2		33.7	17.6		34.8	25.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6			39.4		12.0	0.9		5.2	150.8	
Delay (s)		22.1			65.6		45.8	18.5		39.9	176.3	
Level of Service		C			E		D	B		D	F	
Approach Delay (s)		22.1			65.6			24.8			168.0	
Approach LOS		C			E			C			F	

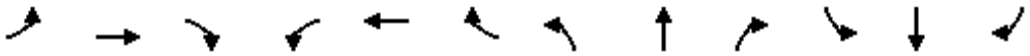
Intersection Summary			
HCM 2000 Control Delay	101.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	110.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	51	13	76	3	15	458
Future Volume (vph)	51	13	76	3	15	458
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	14	83	3	16	498

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	69	86	514
Volume Left (vph)	55	0	16
Volume Right (vph)	14	3	0
Hadj (s)	0.07	0.01	0.04
Departure Headway (s)	5.3	4.6	4.2
Degree Utilization, x	0.10	0.11	0.60
Capacity (veh/h)	610	742	833
Control Delay (s)	8.9	8.2	13.5
Approach Delay (s)	8.9	8.2	13.5
Approach LOS	A	A	B

Intersection Summary			
Delay	12.3		
Level of Service	B		
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	18	0	0	0	10	1	35	56	0	0	0	19
Future Volume (vph)	18	0	0	0	10	1	35	56	0	0	0	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	0	0	0	11	1	38	61	0	0	0	21

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	20	12	38	61	21
Volume Left (vph)	20	0	38	0	0
Volume Right (vph)	0	1	0	0	21
Hadj (s)	0.23	-0.02	0.53	0.03	-0.57
Departure Headway (s)	4.4	4.2	5.1	4.6	3.6
Degree Utilization, x	0.02	0.01	0.05	0.08	0.02
Capacity (veh/h)	789	834	689	763	980
Control Delay (s)	7.5	7.2	7.2	6.8	6.7
Approach Delay (s)	7.5	7.2	7.0		6.7
Approach LOS	A	A	A		A

Intersection Summary				
Delay	7.0			
Level of Service	A			
Intersection Capacity Utilization	24.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection: 1: Frontage Rd & Gilman St

Movement	EB	WB	WB	NB	SB
Directions Served	LT	LT	TR	LTR	LTR
Maximum Queue (ft)	30	77	31	227	30
Average Queue (ft)	1	21	1	86	5
95th Queue (ft)	10	64	10	164	23
Link Distance (ft)	433	60	60	215	224
Upstream Blk Time (%)		1		1	
Queuing Penalty (veh)		6		0	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Gilman St & WB I-80 Ramps

Movement	EB	EB	WB	WB	SB	SB	B48
Directions Served	T	TR	LT	T	L	LTR	T
Maximum Queue (ft)	51	50	116	31	588	618	2575
Average Queue (ft)	18	9	51	1	323	601	2496
95th Queue (ft)	46	35	103	10	694	618	2875
Link Distance (ft)	60	60	196	196	520	520	2523
Upstream Blk Time (%)	0	0			0	97	93
Queuing Penalty (veh)	0	0			0	0	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 3: EB I-80 Ramps & Gilman St

Movement	EB	EB	WB	WB	NB	NB
Directions Served	LT	T	T	TR	LT	TR
Maximum Queue (ft)	116	31	32	93	53	220
Average Queue (ft)	31	2	4	6	20	84
95th Queue (ft)	86	13	21	37	48	159
Link Distance (ft)	196	196	14	14	356	356
Upstream Blk Time (%)			0	0		
Queuing Penalty (veh)			0	2		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Eastshore Hwy & Gilman St

Movement	EB	EB	WB	WB	B43	NB	NB	SB	B40	B36
Directions Served	LT	TR	LT	TR	T	LT	TR	LTR	T	T
Maximum Queue (ft)	31	104	184	19	20	96	51	191	182	346
Average Queue (ft)	24	12	24	1	1	32	18	157	147	338
95th Queue (ft)	43	47	93	6	7	68	46	172	163	347
Link Distance (ft)	14	14	113	113	12	130	130	85	72	331
Upstream Blk Time (%)	3	0	1		0			100	100	57
Queuing Penalty (veh)	15	2	4		0			508	509	291
Storage Bay Dist (ft)										
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 5: Second St & Gilman St

Movement	EB	WB	NB
Directions Served	LT	LT	LTR
Maximum Queue (ft)	72	25	48
Average Queue (ft)	15	3	12
95th Queue (ft)	56	15	32
Link Distance (ft)	12	616	621
Upstream Blk Time (%)	2		
Queuing Penalty (veh)	8		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: 4th St & Gilman St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	R	LT	R	LTR	LTR
Maximum Queue (ft)	184	92	237	27	104	50
Average Queue (ft)	72	19	131	1	29	21
95th Queue (ft)	127	59	209	9	65	46
Link Distance (ft)	616		260		568	627
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		70		75		
Storage Blk Time (%)	5	0	12			
Queuing Penalty (veh)	4	0	0			

Intersection: 7: 6th St & Gilman St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	247	164	105	286	104	133	89	194
Average Queue (ft)	22	98	65	180	67	39	13	106
95th Queue (ft)	97	164	132	278	114	84	63	175
Link Distance (ft)	259			275		636		585
Upstream Blk Time (%)	0			1				
Queuing Penalty (veh)	0			11				
Storage Bay Dist (ft)		140	80		90		65	
Storage Blk Time (%)		2	1	26	9	0	0	21
Queuing Penalty (veh)		1	5	20	7	0	0	3

Intersection: 8: 8th St & Gilman St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	LTR	LTR
Maximum Queue (ft)	74	235	89	294	116	476
Average Queue (ft)	17	69	23	149	52	389
95th Queue (ft)	47	153	70	257	100	542
Link Distance (ft)		235		289	638	424
Upstream Blk Time (%)		0		0		39
Queuing Penalty (veh)		1		3		0
Storage Bay Dist (ft)	50		65			
Storage Blk Time (%)	0	10	0	24		
Queuing Penalty (veh)	0	3	0	5		

Intersection: 9: 9th St & Gilman St

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	L	TR
Maximum Queue (ft)	74	98	100	256	74	52	118
Average Queue (ft)	37	44	23	176	35	13	53
95th Queue (ft)	66	82	65	269	70	39	99
Link Distance (ft)		289		253	599		398
Upstream Blk Time (%)				0			
Queuing Penalty (veh)				3			
Storage Bay Dist (ft)	80		75			90	
Storage Blk Time (%)	1	1		22			1
Queuing Penalty (veh)	6	0		10			0

Intersection: 10: 10th St & Gilman St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	R	LTR	LTR
Maximum Queue (ft)	118	75	269	30	73	88
Average Queue (ft)	12	10	54	1	35	39
95th Queue (ft)	58	46	180	10	64	67
Link Distance (ft)	253		265		656	393
Upstream Blk Time (%)			0			
Queuing Penalty (veh)			1			
Storage Bay Dist (ft)		50		75		
Storage Blk Time (%)	2	0	3			
Queuing Penalty (veh)	6	1	2			

Intersection: 11: San Pablo Ave & Gilman St

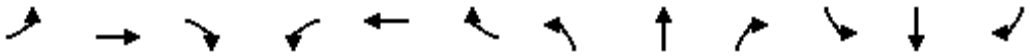
Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	202	201	567	138	169	164	174	738	750
Average Queue (ft)	98	108	469	91	104	78	120	714	714
95th Queue (ft)	169	172	668	141	165	145	218	753	757
Link Distance (ft)	265	265	515		833	833		698	698
Upstream Blk Time (%)			65					68	75
Queuing Penalty (veh)			0					0	0
Storage Bay Dist (ft)				160			150		
Storage Blk Time (%)					1		0	62	
Queuing Penalty (veh)					1		0	60	

Intersection: 12: Harrison St & Eastshore Hwy

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	209	32	347
Average Queue (ft)	106	26	315
95th Queue (ft)	232	45	335
Link Distance (ft)	196	331	295
Upstream Blk Time (%)	31		96
Queuing Penalty (veh)	20		0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: Harrison St & Second St

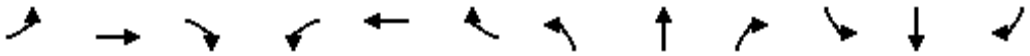
Movement	EB	WB	NB	NB	SB
Directions Served	LT	TR	L	TR	LTR
Maximum Queue (ft)	24	56	96	67	52
Average Queue (ft)	6	14	31	28	17
95th Queue (ft)	23	37	77	49	43
Link Distance (ft)	196	91	98	98	149
Upstream Blk Time (%)			8		
Queuing Penalty (veh)			3		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	172	452	314	170	18	17	0	452	11	4	4
Future Volume (Veh/h)	1	172	452	314	170	18	17	0	452	11	4	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	187	491	341	185	20	18	0	491	12	4	4
Pedestrians		2						4			4	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		3.5						3.5			3.5	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					369							
pX, platoon unblocked												
vC, conflicting volume	209			682			976	1084	191	1561	1565	108
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	209			682			976	1084	191	1561	1565	108
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			62			87	100	40	43	94	100
cM capacity (veh/h)	1354			903			137	133	815	21	68	919

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	188	491	434	112	509	20
Volume Left	1	0	341	0	18	12
Volume Right	0	491	0	20	491	4
cSH	1354	1700	903	1700	694	32
Volume to Capacity	0.00	0.29	0.38	0.07	0.73	0.63
Queue Length 95th (ft)	0	0	44	0	161	53
Control Delay (s)	0.0	0.0	9.9	0.0	23.1	233.9
Lane LOS	A		A		C	F
Approach Delay (s)	0.0		7.9		23.1	233.9
Approach LOS					C	F

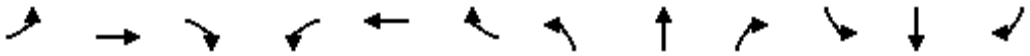
Intersection Summary				
Average Delay	11.8			
Intersection Capacity Utilization	65.8%	ICU Level of Service		C
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	615	20	313	60	0	0	0	0	572	6	442
Future Volume (Veh/h)	0	615	20	313	60	0	0	0	0	572	6	442
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	668	22	340	65	0	0	0	0	622	7	480
Pedestrians											14	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					232							
pX, platoon unblocked												
vC, conflicting volume	79			690			1875	1438	345	1093	1449	46
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	79			690			1875	1438	345	1093	1449	46
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			62			100	100	100	0	91	52
cM capacity (veh/h)	1497			900			15	81	651	116	80	999

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	445	245	362	43	415	694
Volume Left	0	0	340	0	415	207
Volume Right	0	22	0	0	0	480
cSH	1700	1700	900	1700	116	296
Volume to Capacity	0.26	0.14	0.38	0.03	3.56	2.35
Queue Length 95th (ft)	0	0	44	0	Err	1365
Control Delay (s)	0.0	0.0	11.0	0.0	Err	644.6
Lane LOS			B		F	F
Approach Delay (s)	0.0		9.8		4142.3	
Approach LOS					F	

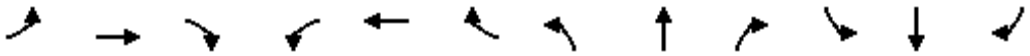
Intersection Summary				
Average Delay	2086.1			
Intersection Capacity Utilization	74.5%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	392	795	0	0	336	820	37	22	180	0	0	0
Future Volume (vph)	392	795	0	0	336	820	37	22	180	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.5	4.5		4.5	4.5			
Lane Util. Factor	1.00	0.95			1.00	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.95		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.97	1.00			
Satd. Flow (prot)	1770	3539			1863	1504		1806	1583			
Flt Permitted	0.95	1.00			1.00	1.00		0.97	1.00			
Satd. Flow (perm)	1770	3539			1863	1504		1806	1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	426	864	0	0	365	891	40	24	196	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	193	0	0	180	0	0	0
Lane Group Flow (vph)	426	864	0	0	365	698	0	64	16	0	0	0
Confl. Peds. (#/hr)	19		12	12		19						
Confl. Bikes (#/hr)			4			3						
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	33.6	100.2			62.1	62.1		9.7	9.7			
Effective Green, g (s)	33.6	100.2			62.1	62.1		9.7	9.7			
Actuated g/C Ratio	0.28	0.84			0.52	0.52		0.08	0.08			
Clearance Time (s)	4.5	4.5			4.5	4.5		4.5	4.5			
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)	500	2982			973	785		147	129			
v/s Ratio Prot	c0.24	0.24			0.20							
v/s Ratio Perm						c0.46		0.04	0.01			
v/c Ratio	0.85	0.29			0.38	0.89		0.44	0.12			
Uniform Delay, d1	40.3	1.9			16.9	25.3		52.0	50.7			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	13.2	0.1			0.2	12.0		2.1	0.4			
Delay (s)	53.5	2.0			17.1	37.3		54.1	51.1			
Level of Service	D	A			B	D		D	D			
Approach Delay (s)		19.0			31.4			51.8			0.0	
Approach LOS		B			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	118.9	Sum of lost time (s)	13.5
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		

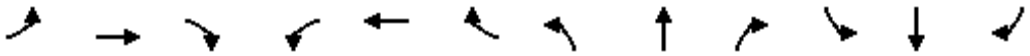
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	761	103	7	957	167	118	54	72	43	31	81
Future Volume (Veh/h)	111	761	103	7	957	167	118	54	72	43	31	81
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	121	827	112	8	1040	182	128	59	78	47	34	88
Pedestrians					5			8			11	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					3.5			3.5			3.5	
Percent Blockage					0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		84			934							
pX, platoon unblocked				0.95			0.95	0.95	0.95	0.95	0.95	
vC, conflicting volume	1233			947			1774	2382	482	1926	2347	622
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1233			837			1708	2349	347	1868	2312	622
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	78			99			0	0	87	0	0	79
cM capacity (veh/h)	555			747			0	26	608	0	27	425

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	534	526	528	702	158	108	169
Volume Left	121	0	8	0	128	0	47
Volume Right	0	112	0	182	0	78	88
cSH	555	1700	747	1700	0	84	0
Volume to Capacity	0.22	0.31	0.01	0.41	Err	1.28	Err
Queue Length 95th (ft)	21	0	1	0	Err	200	Err
Control Delay (s)	6.0	0.0	0.3	0.0	Err	280.3	Err
Lane LOS	A		A		F	F	F
Approach Delay (s)	3.0		0.1		Err		Err
Approach LOS					F		F

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	90.4%	ICU Level of Service	E	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	827	8	2	1082	16	49	9	73	0	0	0
Future Volume (Veh/h)	41	827	8	2	1082	16	49	9	73	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	45	899	9	2	1176	17	53	10	79	0	0	0
Pedestrians		2			2			5			7	
Lane Width (ft)		12.0			12.0			12.0			0.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		332			686							
pX, platoon unblocked				0.92			0.92	0.92	0.92	0.92	0.92	
vC, conflicting volume	1200			913			1588	2198	906	2270	2198	606
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1200			865			1595	2256	857	2334	2256	606
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			100			14	71	71	100	100	100
cM capacity (veh/h)	577			712			61	34	276	9	34	440

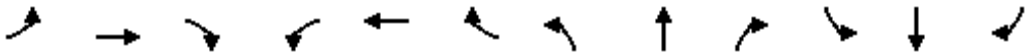
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	944	9	590	605	142
Volume Left	45	0	2	0	53
Volume Right	0	9	0	17	79
cSH	577	1700	712	1700	99
Volume to Capacity	0.08	0.01	0.00	0.36	1.44
Queue Length 95th (ft)	6	0	0	0	263
Control Delay (s)	2.4	0.0	0.1	0.0	323.8
Lane LOS	A		A		F
Approach Delay (s)	2.4		0.0		323.8
Approach LOS					F

Intersection Summary			
Average Delay	21.1		
Intersection Capacity Utilization	98.0%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	854	24	14	1082	4	13	0	72	2	11	5
Future Volume (vph)	22	854	24	14	1082	4	13	0	72	2	11	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5		4.5			4.5	
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.96		1.00	0.97		0.96			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.89			0.96	
Flt Protected		1.00	1.00		1.00	1.00		0.99			0.99	
Satd. Flow (prot)		1860	1524		1862	1538		1578			1784	
Flt Permitted		0.96	1.00		0.99	1.00		0.94			0.98	
Satd. Flow (perm)		1787	1524		1839	1538		1501			1751	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	928	26	15	1176	4	14	0	78	2	12	5
RTOR Reduction (vph)	0	0	4	0	0	1	0	71	0	0	5	0
Lane Group Flow (vph)	0	952	22	0	1191	3	0	21	0	0	14	0
Confl. Peds. (#/hr)	3		8	8		3			11	11		
Confl. Bikes (#/hr)			3			5						
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		58.5	58.5		58.5	58.5		7.0			7.0	
Effective Green, g (s)		58.5	58.5		58.5	58.5		7.0			7.0	
Actuated g/C Ratio		0.79	0.79		0.79	0.79		0.09			0.09	
Clearance Time (s)		4.5	4.5		4.5	4.5		4.5			4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		1403	1196		1444	1207		141			164	
v/s Ratio Prot												
v/s Ratio Perm		0.53	0.01		c0.65	0.00		c0.01			0.01	
v/c Ratio		0.68	0.02		0.82	0.00		0.15			0.09	
Uniform Delay, d1		3.7	1.7		4.9	1.7		31.0			30.8	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		1.3	0.0		4.0	0.0		0.5			0.2	
Delay (s)		5.0	1.7		8.9	1.7		31.5			31.1	
Level of Service		A	A		A	A		C			C	
Approach Delay (s)		4.9			8.8			31.5			31.1	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	74.5	Sum of lost time (s)	9.0
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	15		

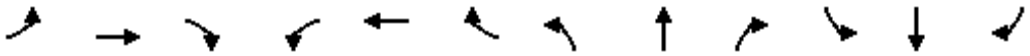
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	757	127	66	683	18	374	184	135	12	83	43
Future Volume (vph)	44	757	127	66	683	18	374	184	135	12	83	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.94		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1811		1770	1851		1754	1721		1761	1747	
Flt Permitted	0.16	1.00		0.10	1.00		0.67	1.00		0.41	1.00	
Satd. Flow (perm)	304	1811		177	1851		1231	1721		751	1747	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	823	138	72	742	20	407	200	147	13	90	47
RTOR Reduction (vph)	0	7	0	0	1	0	0	35	0	0	25	0
Lane Group Flow (vph)	48	954	0	72	761	0	407	312	0	13	112	0
Confl. Peds. (#/hr)	28		10	10		28	5		5	5		5
Confl. Bikes (#/hr)			4			5			1			2
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	42.1	42.1		42.1	42.1		29.9	29.9		29.9	29.9	
Effective Green, g (s)	42.1	42.1		42.1	42.1		29.9	29.9		29.9	29.9	
Actuated g/C Ratio	0.53	0.53		0.53	0.53		0.37	0.37		0.37	0.37	
Clearance Time (s)	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	
Lane Grp Cap (vph)	159	953		93	974		460	643		280	652	
v/s Ratio Prot		c0.53			0.41			0.18			0.06	
v/s Ratio Perm	0.16			0.41			c0.33			0.02		
v/c Ratio	0.30	1.00		0.77	0.78		0.88	0.49		0.05	0.17	
Uniform Delay, d1	10.7	18.9		15.1	15.2		23.4	19.2		16.0	16.8	
Progression Factor	1.00	1.00		0.78	0.77		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.8	29.4		36.1	4.6		18.0	0.6		0.1	0.1	
Delay (s)	15.5	48.3		47.9	16.3		41.5	19.7		16.0	16.9	
Level of Service	B	D		D	B		D	B		B	B	
Approach Delay (s)		46.8			19.1			31.5			16.8	
Approach LOS		D			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	32.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	101.4%	ICU Level of Service	G
Analysis Period (min)	15		

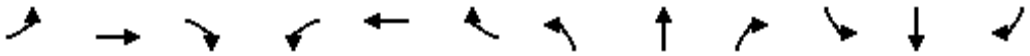
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	800	67	6	653	80	68	186	62	41	57	46
Future Volume (vph)	37	800	67	6	653	80	68	186	62	41	57	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99			0.99			0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.98			0.97			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1746	1832		1770	1813			1775			1732	
Flt Permitted	0.24	1.00		0.16	1.00			0.89			0.75	
Satd. Flow (perm)	449	1832		305	1813			1602			1314	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	870	73	7	710	87	74	202	67	45	62	50
RTOR Reduction (vph)	0	4	0	0	5	0	0	11	0	0	21	0
Lane Group Flow (vph)	40	939	0	7	792	0	0	332	0	0	136	0
Confl. Peds. (#/hr)	35		19	19		35	6		9	9		6
Confl. Bikes (#/hr)			7			6			4			4
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	53.0	53.0		53.0	53.0			19.0			19.0	
Effective Green, g (s)	53.0	53.0		53.0	53.0			19.0			19.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.24			0.24	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	297	1213		202	1201			380			312	
v/s Ratio Prot		c0.51			0.44							
v/s Ratio Perm	0.09			0.02				c0.21			0.10	
v/c Ratio	0.13	0.77		0.03	0.66			0.87			0.43	
Uniform Delay, d1	5.0	9.4		4.7	8.1			29.4			25.9	
Progression Factor	0.42	0.39		0.32	0.41			1.00			1.00	
Incremental Delay, d2	0.4	2.0		0.3	2.3			23.4			4.4	
Delay (s)	2.5	5.6		1.7	5.6			52.7			30.3	
Level of Service	A	A		A	A			D			C	
Approach Delay (s)		5.5			5.6			52.7			30.3	
Approach LOS		A			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

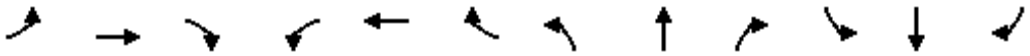
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	124	758	21	49	664	31	47	66	110	48	20	28
Future Volume (vph)	124	758	21	49	664	31	47	66	110	48	20	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	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.95		1.00	0.97	
Flpb, ped/bikes	0.98	1.00		1.00	1.00			0.99		0.96	1.00	
Frt	1.00	1.00		1.00	0.99			0.93		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1739	1853		1770	1841			1620		1696	1643	
Flt Permitted	0.27	1.00		0.22	1.00			0.93		0.46	1.00	
Satd. Flow (perm)	490	1853		403	1841			1520		825	1643	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	135	824	23	53	722	34	51	72	120	52	22	30
RTOR Reduction (vph)	0	1	0	0	2	0	0	44	0	0	23	0
Lane Group Flow (vph)	135	846	0	53	754	0	0	199	0	52	29	0
Confl. Peds. (#/hr)	40		13	13		40	14		37	37		14
Confl. Bikes (#/hr)			7			4			8			7
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	53.0	53.0		53.0	53.0			19.0		19.0	19.0	
Effective Green, g (s)	53.0	53.0		53.0	53.0			19.0		19.0	19.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.24		0.24	0.24	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	324	1227		266	1219			361		195	390	
v/s Ratio Prot		c0.46			0.41						0.02	
v/s Ratio Perm	0.28			0.13				c0.13		0.06		
v/c Ratio	0.42	0.69		0.20	0.62			0.55		0.27	0.07	
Uniform Delay, d1	6.3	8.4		5.2	7.7			26.8		24.8	23.7	
Progression Factor	1.04	0.89		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	2.4	2.0		1.7	2.4			5.9		3.3	0.4	
Delay (s)	9.0	9.4		6.9	10.1			32.7		28.2	24.0	
Level of Service	A	A		A	B			C		C	C	
Approach Delay (s)		9.3			9.9			32.7			26.1	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		

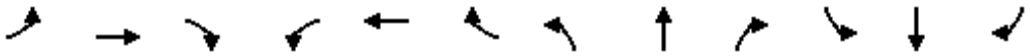
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	827	52	11	607	101	99	11	176	26	18	38
Future Volume (Veh/h)	37	827	52	11	607	101	99	11	176	26	18	38
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	899	57	12	660	110	108	12	191	28	20	41
Pedestrians		10			17			9			14	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		1			2			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		315			340							
pX, platoon unblocked	0.80						0.80	0.80		0.80	0.80	0.80
vC, conflicting volume	784			965			1762	1824	504	1442	1743	684
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	608			965			1826	1904	504	1427	1803	484
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			98			0	76	62	20	65	90
cM capacity (veh/h)	765			703			23	50	500	35	58	415

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	490	506	672	110	311	89
Volume Left	40	0	12	0	108	28
Volume Right	0	57	0	110	191	41
cSH	765	1700	703	1700	59	71
Volume to Capacity	0.05	0.30	0.02	0.06	5.26	1.25
Queue Length 95th (ft)	4	0	1	0	Err	174
Control Delay (s)	1.5	0.0	0.5	0.0	Err	287.4
Lane LOS	A		A		F	F
Approach Delay (s)	0.7		0.4		Err	287.4
Approach LOS					F	F

Intersection Summary				
Average Delay	1440.0			
Intersection Capacity Utilization	82.6%	ICU Level of Service	E	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	258	545	226	42	338	79	223	1141	37	210	1308	158
Future Volume (vph)	258	545	226	42	338	79	223	1141	37	210	1308	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	4.5		4.0	4.5	
Lane Util. Factor		0.95			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.98		1.00	1.00		1.00	0.98	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3334			1792		1770	3518		1770	3437	
Flt Permitted		0.60			0.43		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2042			770		1770	3518		1770	3437	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	280	592	246	46	367	86	242	1240	40	228	1422	172
RTOR Reduction (vph)	0	29	0	0	8	0	0	3	0	0	10	0
Lane Group Flow (vph)	0	1089	0	0	491	0	242	1277	0	228	1584	0
Confl. Peds. (#/hr)	45		28	28		45	37		15	15		37
Confl. Bikes (#/hr)			8			3			6			9
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		31.5			31.5		15.2	31.6		13.4	29.8	
Effective Green, g (s)		31.5			31.5		15.2	31.6		13.4	29.8	
Actuated g/C Ratio		0.35			0.35		0.17	0.35		0.15	0.33	
Clearance Time (s)		5.0			5.0		4.0	4.5		4.0	4.5	
Vehicle Extension (s)		2.0			2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		714			269		298	1235		263	1138	
v/s Ratio Prot							c0.14	0.36		0.13	c0.46	
v/s Ratio Perm		0.53			c0.64							
v/c Ratio		1.53			1.82		0.81	1.03		0.87	1.39	
Uniform Delay, d1		29.2			29.2		36.0	29.2		37.4	30.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		243.7			384.9		14.6	34.9		23.9	181.8	
Delay (s)		272.9			414.1		50.7	64.1		61.3	211.9	
Level of Service		F			F		D	E		E	F	
Approach Delay (s)		272.9			414.1			62.0			193.1	
Approach LOS		F			F			E			F	

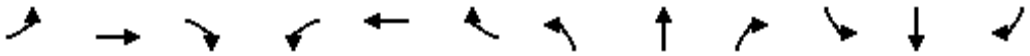
Intersection Summary			
HCM 2000 Control Delay	193.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.45		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	125.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	45	22	329	3	4	110
Future Volume (vph)	45	22	329	3	4	110
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	24	358	3	4	120

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	73	361	124
Volume Left (vph)	49	0	4
Volume Right (vph)	24	3	0
Hadj (s)	-0.03	0.03	0.04
Departure Headway (s)	4.9	4.3	4.5
Degree Utilization, x	0.10	0.43	0.16
Capacity (veh/h)	661	828	765
Control Delay (s)	8.5	10.4	8.3
Approach Delay (s)	8.5	10.4	8.3
Approach LOS	A	B	A

Intersection Summary			
Delay	9.7		
Level of Service	A		
Intersection Capacity Utilization	28.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	7	0	0	0	0	0	40	26	0	0	0	27
Future Volume (vph)	7	0	0	0	0	0	40	26	0	0	0	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	0	0	0	0	0	43	28	0	0	0	29

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total (vph)	8	0	43	28	29
Volume Left (vph)	8	0	43	0	0
Volume Right (vph)	0	0	0	0	29
Hadj (s)	0.23	0.00	0.53	0.03	-0.57
Departure Headway (s)	4.4	4.1	5.1	4.6	3.5
Degree Utilization, x	0.01	0.00	0.06	0.04	0.03
Capacity (veh/h)	803	900	699	775	1010
Control Delay (s)	7.4	7.1	7.2	6.5	6.6
Approach Delay (s)	7.4	0.0	6.9		6.6
Approach LOS	A	A	A		A

Intersection Summary				
Delay	6.9			
Level of Service	A			
Intersection Capacity Utilization	19.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection: 1: Frontage Rd & Gilman St

Movement	EB	EB	WB	NB	SB
Directions Served	LT	R	LT	LTR	LTR
Maximum Queue (ft)	119	70	76	230	55
Average Queue (ft)	20	14	46	142	17
95th Queue (ft)	80	51	86	264	49
Link Distance (ft)	433	433	60	215	224
Upstream Blk Time (%)			4	20	
Queuing Penalty (veh)			10	0	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Gilman St & WB I-80 Ramps

Movement	EB	EB	WB	SB	SB
Directions Served	T	TR	LT	L	LTR
Maximum Queue (ft)	71	75	156	442	446
Average Queue (ft)	25	48	74	322	419
95th Queue (ft)	58	85	139	579	444
Link Distance (ft)	60	60	194	395	395
Upstream Blk Time (%)	1	12		21	77
Queuing Penalty (veh)	2	40		105	393
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: EB I-80 Ramps & Gilman St

Movement	EB	EB	EB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	LT	R
Maximum Queue (ft)	208	208	55	32	59	94	334
Average Queue (ft)	152	162	11	27	34	35	114
95th Queue (ft)	242	255	43	39	45	81	228
Link Distance (ft)	194	194	194	13	13	376	376
Upstream Blk Time (%)	7	16		29	22		
Queuing Penalty (veh)	28	64		170	127		
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 4: Eastshore Hwy & Gilman St

Movement	EB	EB	WB	WB	B43	NB	NB	SB	B40	B36
Directions Served	LT	TR	LT	TR	T	LT	TR	LTR	T	T
Maximum Queue (ft)	85	75	162	223	111	143	143	202	145	338
Average Queue (ft)	31	5	69	156	41	129	80	148	122	272
95th Queue (ft)	62	32	149	239	113	144	179	195	191	471
Link Distance (ft)	13	13	113	113	12	128	128	85	72	331
Upstream Blk Time (%)	34	0	3	24	9	97	48	91	89	72
Queuing Penalty (veh)	165	1	19	136	51	0	0	141	138	112
Storage Bay Dist (ft)										
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 5: Second St & Gilman St

Movement	EB	B43	WB	WB	NB
Directions Served	LT	T	LT	TR	LTR
Maximum Queue (ft)	102	198	616	105	636
Average Queue (ft)	51	74	75	43	404
95th Queue (ft)	115	207	344	119	740
Link Distance (ft)	12	113	616		621
Upstream Blk Time (%)	24	16	0		21
Queuing Penalty (veh)	107	71	2		0
Storage Bay Dist (ft)				80	
Storage Blk Time (%)			0	8	
Queuing Penalty (veh)			1	42	

Intersection: 6: 4th St & Gilman St

Movement	EB	EB	WB	NB	SB
Directions Served	LT	R	LT	LTR	LTR
Maximum Queue (ft)	637	95	283	67	44
Average Queue (ft)	225	8	184	29	8
95th Queue (ft)	591	45	301	56	27
Link Distance (ft)	616		270	568	624
Upstream Blk Time (%)	10		3		
Queuing Penalty (veh)	92		28		
Storage Bay Dist (ft)		70			
Storage Blk Time (%)	25	0	18		
Queuing Penalty (veh)	6	0	1		

Intersection: 7: 6th St & Gilman St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	267	165	105	252	114	651	31	139
Average Queue (ft)	182	143	53	165	113	319	5	51
95th Queue (ft)	354	218	100	262	117	584	22	102
Link Distance (ft)	248			250		636		585
Upstream Blk Time (%)	10			1		2		
Queuing Penalty (veh)	94			10		0		
Storage Bay Dist (ft)		140	80		90		65	
Storage Blk Time (%)	0	23	9	31	40	19		6
Queuing Penalty (veh)	0	10	60	20	127	72		1

Intersection: 8: 8th St & Gilman St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	LTR	LTR
Maximum Queue (ft)	74	260	31	132	555	331
Average Queue (ft)	19	91	2	44	201	94
95th Queue (ft)	54	189	15	87	413	215
Link Distance (ft)		260		289	638	424
Upstream Blk Time (%)		1				
Queuing Penalty (veh)		6				
Storage Bay Dist (ft)	50		65			
Storage Blk Time (%)	0	18		2		
Queuing Penalty (veh)	1	7		0		

Intersection: 9: 9th St & Gilman St

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	L	TR
Maximum Queue (ft)	105	296	99	253	266	74	74
Average Queue (ft)	50	153	28	141	115	34	24
95th Queue (ft)	110	281	75	265	204	69	55
Link Distance (ft)		289		253	599		398
Upstream Blk Time (%)		2		0			
Queuing Penalty (veh)		18		2			
Storage Bay Dist (ft)	80		75			90	
Storage Blk Time (%)	1	22	0	13		0	0
Queuing Penalty (veh)	6	27	1	6		0	0

Intersection: 10: 10th St & Gilman St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	R	LTR	LTR
Maximum Queue (ft)	271	75	141	49	690	149
Average Queue (ft)	78	25	20	6	621	41
95th Queue (ft)	232	79	78	27	792	87
Link Distance (ft)	253		265		656	393
Upstream Blk Time (%)	4				63	
Queuing Penalty (veh)	38				0	
Storage Bay Dist (ft)		50		75		
Storage Blk Time (%)	12	1	1			
Queuing Penalty (veh)	56	6	1			

Intersection: 11: San Pablo Ave & Gilman St

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	271	291	567	185	867	896	175	750	750
Average Queue (ft)	218	219	525	162	500	447	156	715	709
95th Queue (ft)	304	305	590	231	846	802	227	766	803
Link Distance (ft)	265	265	515		833	833		698	698
Upstream Blk Time (%)	11	5	82		6	4		68	68
Queuing Penalty (veh)	55	24	0		0	0		0	0
Storage Bay Dist (ft)				160			150		
Storage Blk Time (%)				14	44		16	58	
Queuing Penalty (veh)				82	98		104	122	

Intersection: 12: Harrison St & Eastshore Hwy

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	204	105	310
Average Queue (ft)	132	43	233
95th Queue (ft)	266	73	413
Link Distance (ft)	196	331	295
Upstream Blk Time (%)	51		61
Queuing Penalty (veh)	34		0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: Harrison St & Second St

Movement	EB	NB	NB	SB
Directions Served	LT	L	TR	LTR
Maximum Queue (ft)	24	156	30	164
Average Queue (ft)	3	47	14	61
95th Queue (ft)	16	107	38	168
Link Distance (ft)	196	98	98	149
Upstream Blk Time (%)		9		27
Queuing Penalty (veh)		3		0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

2020 Build Conditions

LANE SUMMARY

Site: East Roundabout 2020 AM

Network: 2020 AM Network

New Site
Roundabout

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist ft		ft	%	%
South: Eastshore Hwy															
Lane 1[d]	65	2.0	65	2.0	517	0.126	100	8.6	LOS A	0.5	11.9	Full	1000	0.0	0.0
Approach	65	2.0	65	2.0		0.126		8.6	LOS A	0.5	11.9				
East: Gilman St															
Lane 1[d]	516	2.0	516	2.0	1414	0.365	100	5.8	LOS A	2.2	57.1	Full	183	0.0	0.0
Lane 2	305	2.0	305	2.0	1394	0.219	100	4.4	LOS A	1.3	31.9	Full	122	0.0	0.0
Approach	821	2.0	821	2.0		0.365		5.3	LOS A	2.2	57.1				
North: Eastshore Hwy															
Lane 1[d]	398	2.0	398	2.0	665	0.598	100	16.1	LOS B	3.8	95.8	Full	575	0.0	0.0
Approach	398	2.0	398	2.0		0.598		16.1	LOS B	3.8	95.8				
West: Gilman St															
Lane 1[d]	789	2.0	789	2.0	1337	0.591	100	9.5	LOS A	5.4	138.3	Full	270	0.0	0.0
Approach	789	2.0	789	2.0		0.591		9.5	LOS A	5.4	138.3				
SouthWest: I-80 EB Off Ramp															
Lane 1[d]	397	2.0	397	2.0	598	0.664	100	20.4	LOS C	4.6	116.3	Full	1150	0.0	0.0
Approach	397	2.0	397	2.0		0.664		20.4	LOS C	4.6	116.3				
Intersection	2471	2.0	2471	2.0		0.664		10.9	LOS B	5.4	138.3				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: West Roundabout 2020 AM

Network: 2020 AM Network

New Site
Roundabout

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist ft		ft	%	%
South: Frontage Road															
Lane 1[d]	122	2.0	122	2.0	418	0.292	100	13.6	LOS B	1.1	29.0	Full	1215	0.0	0.0
Approach	122	2.0	122	2.0		0.292		13.6	LOS B	1.1	29.0				
East: Gilman Street															
Lane 1	329	2.0	329	2.0	1383	0.238	100	4.6	LOS A	1.3	32.9	Short	115	0.0	NA
Lane 2[d]	474	2.0	474	2.0	1383	0.342	100	5.7	LOS A	2.1	54.4	Full	270	0.0	0.0
Approach	803	2.0	803	2.0		0.342		5.2	LOS A	2.1	54.4				
North: I-80 WB Off Ramp															
Lane 1[d]	709	2.0	709	2.0	755	0.939	100	42.8	LOS D	15.6	397.5	Full	1080	0.0	0.0
Lane 2	634	2.0	634	2.0	694	0.913	100	40.2	LOS D	13.9	352.9	Short	675	0.0	NA
Approach	1343	2.0	1343	2.0		0.939		41.6	LOS D	15.6	397.5				
West: Gilman Street															
Lane 1[d]	169	2.0	169	2.0	268	0.632	100	37.1	LOS D	2.8	72.0	Full	335	0.0	0.0
Approach	169	2.0	169	2.0		0.632		37.1	LOS D	2.8	72.0				
Intersection	2438	2.0	2438	2.0		0.939		27.9	LOS C	15.6	397.5				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: East Roundabout 2020 PM

Network: 2020 PM Meter

New Site
Roundabout

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist ft		ft	%	%
South: Eastshore Hwy															
Lane 1[d]	201	2.0	201	2.0	544	0.370	100	12.3	LOS B	1.6	41.7	Full	1000	0.0	0.0
Approach	201	2.0	201	2.0		0.370		12.3	LOS B	1.6	41.7				
East: Gilman St															
Lane 1	308	2.0	308	2.0	861	0.358	100	8.3	LOS A	1.9	47.7	Full	183	0.0	0.0
Lane 2[d]	702	2.0	702	2.0	916	0.766	100	19.4	LOS B	8.2	207.1	Full	122	0.0	23.9
Approach	1011	2.0	1011	2.0		0.766		16.0	LOS B	8.2	207.1				
North: Eastshore Hwy															
Lane 1[d]	141	2.0	141	2.0	362	0.389	100	18.1	LOS B	1.6	40.0	Full	575	0.0	0.0
Approach	141	2.0	141	2.0		0.389		18.1	LOS B	1.6	40.0				
West: Gilman St															
Lane 1[d]	1195	2.0	1016	2.0	1367	0.743	100	13.5	LOS B	10.6	268.1	Full	270	0.0	4.8
Approach	1195	2.0	1016[N1]	2.0		0.743		13.5	LOS B	10.6	268.1				
SouthWest: I-80 EB Off Ramp															
Lane 1[d]	136	2.0	136	2.0	486	0.279	100	11.6	LOS B	1.1	28.2	Full	1150	0.0	0.0
Approach	136	2.0	136	2.0		0.279		11.6	LOS B	1.1	28.2				
Intersection	2683	2.0	2505[N1]	2.1		0.766		14.6	LOS B	10.6	268.1				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

LANE SUMMARY

Site: East Roundabout 2020 PM

Network: 2020 PM Network

New Site
Roundabout

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist ft		ft	%	%
South: Eastshore Hwy															
Lane 1[d]	201	2.0	201	2.0	496	0.405	100	14.1	LOS B	1.8	46.2	Full	1000	0.0	0.0
Approach	201	2.0	201	2.0		0.405		14.1	LOS B	1.8	46.2				
East: Gilman St															
Lane 1	308	2.0	308	2.0	823	0.375	100	8.8	LOS A	2.0	51.0	Full	183	0.0	0.0
Lane 2[d]	702	2.0	702	2.0	880	0.797	100	22.0	LOS C	8.9	227.1	Full	122	0.0	28.4
Approach	1011	2.0	1011	2.0		0.797		18.0	LOS B	8.9	227.1				
North: Eastshore Hwy															
Lane 1[d]	141	2.0	141	2.0	348	0.405	100	19.2	LOS B	1.6	41.7	Full	575	0.0	0.0
Approach	141	2.0	141	2.0		0.405		19.2	LOS B	1.6	41.7				
West: Gilman St															
Lane 1[d]	1195	2.0	1116	2.0	1367	0.816	100	17.1	LOS B	15.1	384.8	Full	270	0.0	16.7
Approach	1195	2.0	1116[N1]	2.0		0.816		17.1	LOS B	15.1	384.8				
SouthWest: I-80 EB Off Ramp															
Lane 1[d]	136	2.0	136	2.0	439	0.309	100	13.4	LOS B	1.2	31.6	Full	1150	0.0	0.0
Approach	136	2.0	136	2.0		0.309		13.4	LOS B	1.2	31.6				
Intersection	2683	2.0	2604[N1]	2.1		0.816		17.1	LOS B	15.1	384.8				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

LANE SUMMARY

Site: West Roundabout 2020 PM

Network: 2020 PM Network

New Site
Roundabout

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist ft		ft	%	%
South: Frontage Road															
Lane 1[d]	526	2.0	526	2.0	433	1.215	100	144.5	LOS F	41.2	1046.7	Full	1215	-16.1[N3]	0.8
Approach	526	2.0	526	2.0		1.215		144.5	LOS F	41.2	1046.7				
East: Gilman Street															
Lane 1[d]	214	2.0	214	2.0	1387	0.154	100	3.8	LOS A	0.8	19.3	Short	115	0.0	NA
Lane 2	193	2.0	193	2.0	1387	0.139	100	3.7	LOS A	0.7	17.1	Full	270	0.0	0.0
Approach	406	2.0	406	2.0		0.154		3.8	LOS A	0.8	19.3				
North: I-80 WB Off Ramp															
Lane 1[d]	543	2.0	543	2.0	922	0.589	100	12.3	LOS B	6.5	165.2	Full	1080	-15.4[N3]	0.0
Lane 2	380	2.0	380	2.0	1044	0.364	100	7.2	LOS A	2.1	53.0	Short	675	0.0	NA
Approach	923	2.0	923	2.0		0.589		10.2	LOS B	6.5	165.2				
West: Gilman Street															
Lane 1[d]	255	2.0	255	2.0	503	0.506	100	16.8	LOS B	2.8	72.1	Full	335	-13.3[N3]	0.0
Approach	255	2.0	255	2.0		0.506		16.8	LOS B	2.8	72.1				
Intersection	2111	2.0	2111	2.0		1.215		43.2	LOS D	41.2	1046.7				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach
N3 Capacity Adjustment due to downstream lane blockage determined by the program.

LANE SUMMARY

Site: West Roundabout 2020 PM - Conversion

Network: 2020 PM Meter

New Site
Roundabout Metering

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist ft		ft	%	%
South: Frontage Road															
Lane 1[d]	526	2.0	526	2.0	344	1.532	100	252.2	LOS F	93.7	2380.8	Full	1215	-4.6[N3]	31.2
Approach	526	2.0	526	2.0		1.532		252.2	LOS F	93.7	2380.8				
East: Gilman Street															
Lane 1[d]	214	2.0	214	2.0	1390	0.154	100	0.5	LOS A	0.1	3.1	Short	115	0.0	NA
Lane 2	193	2.0	193	2.0	1390	0.139	100	0.4	LOS A	0.1	2.7	Full	270	0.0	0.0
Approach	406	2.0	406	2.0		0.154		0.5	LOS A	0.1	3.1				
North: I-80 WB Off Ramp															
Lane 1[d]	543	2.0	543	2.0	1044	0.520	100	5.3	LOS A	3.1	77.7	Full	1080	-4.4[N3]	0.0
Lane 2	380	2.0	380	2.0	1046	0.363	100	3.6	LOS A	1.9	49.1	Short	675	0.0	NA
Approach	923	2.0	923	2.0		0.520		4.6	LOS A	3.1	77.7				
West: Gilman Street															
Lane 1[d]	255	2.0	255	2.0	559	0.456	100	10.8	LOS B	2.1	52.4	Full	335	-3.7[N3]	0.0
Approach	255	2.0	255	2.0		0.456		10.8	LOS B	2.1	52.4				
Intersection	2111	2.0	2111	2.0		1.532		66.3	LOS E	93.7	2380.8				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach
N3 Capacity Adjustment due to downstream lane blockage determined by the program.

2040 Build Conditions

LANE SUMMARY

Site: East Roundabout 2040 AM

Network: 2040 AM Network

New Site
Roundabout

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist ft		ft	%	%
South: Eastshore Hwy															
Lane 1[d]	65	2.0	65	2.0	566	0.115	100	7.8	LOS A	0.4	11.1	Full	1000	0.0	0.0
Approach	65	2.0	65	2.0		0.115		7.8	LOS A	0.4	11.1				
East: Gilman St															
Lane 1[d]	506	2.0	506	2.0	1434	0.353	100	5.6	LOS A	2.2	55.0	Full	183	0.0	0.0
Lane 2	256	2.0	256	2.0	1416	0.181	100	4.0	LOS A	1.0	25.4	Full	122	0.0	0.0
Approach	762	2.0	762	2.0		0.353		5.1	LOS A	2.2	55.0				
North: Eastshore Hwy															
Lane 1[d]	403	2.0	403	2.0	712	0.566	100	14.3	LOS B	3.5	89.6	Full	575	0.0	0.0
Approach	403	2.0	403	2.0		0.566		14.3	LOS B	3.5	89.6				
West: Gilman St															
Lane 1[d]	844	2.0	694	2.0	1337	0.519	100	8.2	LOS A	4.2	106.0	Full	270	0.0	0.0
Approach	844	2.0	694[N1]	2.0		0.519		8.2	LOS A	4.2	106.0				
SouthWest: I-80 EB Off Ramp															
Lane 1[d]	393	2.0	393	2.0	659	0.596	100	16.2	LOS B	3.9	98.8	Full	1150	0.0	0.0
Approach	393	2.0	393	2.0		0.596		16.2	LOS B	3.9	98.8				
Intersection	2467	2.0	2317[N1]	2.1		0.596		9.6	LOS A	4.2	106.0				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

LANE SUMMARY

Site: West Roundabout 2040 AM

Network: 2040 AM Network

New Site
Roundabout

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist ft		ft	%	%
South: Frontage Road															
Lane 1[d]	317	2.0	317	2.0	508	0.624	100	21.3	LOS C	3.7	94.7	Full	1215	0.0	0.0
Approach	317	2.0	317	2.0		0.624		21.3	LOS C	3.7	94.7				
East: Gilman Street															
Lane 1	281	2.0	281	2.0	1332	0.211	100	4.5	LOS A	1.1	27.8	Short	115	0.0	NA
Lane 2[d]	492	2.0	492	2.0	1332	0.369	100	6.1	LOS A	2.3	59.4	Full	270	0.0	0.0
Approach	773	2.0	773	2.0		0.369		5.5	LOS A	2.3	59.4				
North: I-80 WB Off Ramp															
Lane 1	922	2.0	922	2.0	690	1.337	100	180.1	LOS F	86.9	2208.5	Full	1080	0.0	46.8[8]
Lane 2[d]	1035	2.0	1035	2.0	751	1.378	100	195.9	LOS F	102.7	2607.6	Short	675	0.0	NA
Approach	1957	2.0	1957	2.0		1.378		188.5	LOS F	102.7	2607.6				
West: Gilman Street															
Lane 1[d]	42	2.0	42	2.0	239	0.176	100	19.1	LOS B	0.6	14.6	Full	335	0.0	0.0
Approach	42	2.0	42	2.0		0.176		19.1	LOS B	0.6	14.6				
Intersection	3088	2.0	3088	2.0		1.378		123.2	LOS F	102.7	2607.6				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

8 Probability of Blockage has been set on the basis of a queue that overflows from an adjacent short lane.
d Dominant lane on roundabout approach

LANE SUMMARY

Site: West Roundabout 2040 AM - NO WBT FROM RAMPS - 25PRCNT RED TO FRONTAGE

Network: 2040 AM wboff to on zeroed further sensitivity

volumes from the wb off ramp to frontage road reduced by 25%
Roundabout

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist ft		ft	%	%
South: Frontage Road															
Lane 1[d]	317	2.0	317	2.0	558	0.568	100	17.4	LOS B	3.3	83.7	Full	1215	0.0	0.0
Approach	317	2.0	317	2.0		0.568		17.4	LOS B	3.3	83.7				
East: Gilman Street															
Lane 1	281	2.0	281	2.0	1332	0.211	100	4.5	LOS A	1.1	27.8	Short	115	0.0	NA
Lane 2[d]	492	2.0	492	2.0	1332	0.369	100	6.1	LOS A	2.3	59.4	Full	270	0.0	0.0
Approach	773	2.0	773	2.0		0.369		5.5	LOS A	2.3	59.4				
North: I-80 WB Off Ramp															
Lane 1	598	2.0	598	2.0	690	0.867	100	33.7	LOS C	11.0	280.4	Short	675	0.0	NA
Lane 2[d]	827	2.0	827	2.0	751	1.102	100	86.6	LOS F	40.6	1030.3	Full	1080	0.0	3.6
Approach	1425	2.0	1425	2.0		1.102		64.4	LOS E	40.6	1030.3				
West: Gilman Street															
Lane 1[d]	42	2.0	42	2.0	265	0.159	100	16.9	LOS B	0.5	13.3	Full	335	0.0	0.0
Approach	42	2.0	42	2.0		0.159		16.9	LOS B	0.5	13.3				
Intersection	2557	2.0	2557	2.0		1.102		40.0	LOS D	40.6	1030.3				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: East Roundabout 2040 PM

Network: 2040 PM Network

New Site
Roundabout

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist ft		ft	%	%
South: Eastshore Hwy															
Lane 1[d]	200	2.0	200	2.0	435	0.459	100	17.4	LOS B	2.1	52.9	Full	1000	0.0	0.0
Approach	200	2.0	200	2.0		0.459		17.4	LOS B	2.1	52.9				
East: Gilman St															
Lane 1	293	2.0	293	2.0	910	0.322	100	7.4	LOS A	1.7	42.7	Full	183	0.0	0.0
Lane 2[d]	715	2.0	715	2.0	963	0.742	100	17.4	LOS B	7.7	196.1	Full	122	0.0	21.5
Approach	1007	2.0	1007	2.0		0.742		14.5	LOS B	7.7	196.1				
North: Eastshore Hwy															
Lane 1[d]	131	2.0	131	2.0	382	0.342	100	15.9	LOS B	1.4	34.3	Full	575	0.0	0.0
Approach	131	2.0	131	2.0		0.342		15.9	LOS B	1.4	34.3				
West: Gilman St															
Lane 1[d]	1249	2.0	1126	2.0	1344	0.838	100	18.8	LOS B	16.0	406.8	Full	270	0.0	18.8
Approach	1249	2.0	1126[N1]	2.0		0.838		18.8	LOS B	16.0	406.8				
SouthWest: I-80 EB Off Ramp															
Lane 1[d]	252	2.0	252	2.0	427	0.589	100	22.7	LOS C	3.1	79.0	Full	1150	0.0	0.0
Approach	252	2.0	252	2.0		0.589		22.7	LOS C	3.1	79.0				
Intersection	2839	2.0	2715[N1]	2.1		0.838		17.3	LOS B	16.0	406.8				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

LANE SUMMARY

Site: East Roundabout 2040 PM

Network: 2040 PM Meter

New Site
Roundabout

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist ft		ft	%	%
South: Eastshore Hwy															
Lane 1[d]	200	2.0	200	2.0	483	0.414	100	14.7	LOS B	1.9	47.2	Full	1000	0.0	0.0
Approach	200	2.0	200	2.0		0.414		14.7	LOS B	1.9	47.2				
East: Gilman St															
Lane 1	293	2.0	293	2.0	945	0.310	100	7.1	LOS A	1.6	41.4	Full	183	0.0	0.0
Lane 2[d]	715	2.0	715	2.0	997	0.717	100	15.8	LOS B	7.2	182.8	Full	122	0.0	18.6
Approach	1007	2.0	1007	2.0		0.717		13.2	LOS B	7.2	182.8				
North: Eastshore Hwy															
Lane 1[d]	131	2.0	131	2.0	395	0.330	100	15.2	LOS B	1.3	33.1	Full	575	0.0	0.0
Approach	131	2.0	131	2.0		0.330		15.2	LOS B	1.3	33.1				
West: Gilman St															
Lane 1[d]	1249	2.0	1012	2.0	1344	0.753	100	14.1	LOS B	10.6	268.6	Full	270	0.0	4.9
Approach	1249	2.0	1012[N1]	2.0		0.753		14.1	LOS B	10.6	268.6				
SouthWest: I-80 EB Off Ramp															
Lane 1[d]	252	2.0	252	2.0	480	0.524	100	18.1	LOS B	2.7	68.6	Full	1150	0.0	0.0
Approach	252	2.0	252	2.0		0.524		18.1	LOS B	2.7	68.6				
Intersection	2839	2.0	2602[N1]	2.2		0.753		14.2	LOS B	10.6	268.6				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

LANE SUMMARY

Site: West Roundabout 2040 PM

Network: 2040 PM Network

New Site
Roundabout

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist ft		ft	%	%
South: Frontage Road															
Lane 1[d]	495	2.0	495	2.0	353	1.401	100	226.1	LOS F	54.3	1380.3	Full	1215	-18.1[N3]	8.9
Approach	495	2.0	495	2.0		1.401		226.1	LOS F	54.3	1380.3				
East: Gilman Street															
Lane 1[d]	329	2.0	329	2.0	1385	0.238	100	4.6	LOS A	1.3	32.9	Short	115	0.0	NA
Lane 2	63	2.0	63	2.0	1385	0.046	100	3.0	LOS A	0.2	5.1	Full	270	0.0	0.0
Approach	393	2.0	393	2.0		0.238		4.3	LOS A	1.3	32.9				
North: I-80 WB Off Ramp															
Lane 1[d]	608	2.0	608	2.0	896	0.679	100	15.4	LOS B	10.4	263.3	Full	1080	-18.7[N3]	0.0
Lane 2	465	2.0	465	2.0	1057	0.440	100	8.3	LOS A	2.7	69.1	Short	675	0.0	NA
Approach	1074	2.0	1074	2.0		0.679		12.3	LOS B	10.4	263.3				
West: Gilman Street															
Lane 1[d]	252	2.0	252	2.0	424	0.593	100	23.1	LOS C	3.4	87.1	Full	335	-15.4[N3]	0.0
Approach	252	2.0	252	2.0		0.593		23.1	LOS C	3.4	87.1				
Intersection	2213	2.0	2213	2.0		1.401		59.9	LOS E	54.3	1380.3				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
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Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach
N3 Capacity Adjustment due to downstream lane blockage determined by the program.

LANE SUMMARY

Site: West Roundabout 2040 PM - Conversion

Network: 2040 PM Meter

New Site
Roundabout Metering

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist ft		ft	%	%
South: Frontage Road															
Lane 1[d]	495	2.0	495	2.0	249	1.988	100	451.6	LOS F	141.2	3585.3	Full	1215	-4.6[N3]	100.0
Approach	495	2.0	495	2.0		1.988		451.6	LOS F	141.2	3585.3				
East: Gilman Street															
Lane 1[d]	329	2.0	329	2.0	1390	0.237	100	0.8	LOS A	0.2	6.0	Short	115	0.0	NA
Lane 2	63	2.0	63	2.0	1390	0.045	100	0.1	LOS A	0.0	0.9	Full	270	0.0	0.0
Approach	393	2.0	393	2.0		0.237		0.7	LOS A	0.2	6.0				
North: I-80 WB Off Ramp															
Lane 1[d]	608	2.0	608	2.0	1053	0.578	100	6.9	LOS A	4.4	111.0	Full	1080	-4.8[N3]	0.0
Lane 2	465	2.0	465	2.0	1061	0.439	100	5.1	LOS A	2.9	72.8	Short	675	0.0	NA
Approach	1074	2.0	1074	2.0		0.578		6.1	LOS A	4.4	111.0				
West: Gilman Street															
Lane 1[d]	252	2.0	252	2.0	482	0.521	100	15.4	LOS B	2.6	65.5	Full	335	-3.9[N3]	0.0
Approach	252	2.0	252	2.0		0.521		15.4	LOS B	2.6	65.5				
Intersection	2213	2.0	2213	2.0		1.988		105.8	LOS F	141.2	3585.3				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach
N3 Capacity Adjustment due to downstream lane blockage determined by the program.