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Technical Memorandum

December 17, 2021 Project# 25023

To: Addie Farrel, Principal
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Los Angeles, CA 90017
(213) 623-1443

From: Fernando Sotelo, TE, PTP and Sam Liu

CC:

RE: Malibu MMHS 1,200-Student Traffic Analyses

INTRODUCTION

This technical study was commissioned by the Santa Monica-Malibu Unified School District (District) at a request from the City of Malibu. The purpose of this study is to analyze and address traffic conditions and intersection operations with the Malibu Middle and High School (MMHS) Specific Plan Project (Project) with a potential enrollment of 1,200 students. This technical memorandum provides additional analysis that was not provided in the Transportation Impact Analysis prepared for the Malibu Middle and High School Campus Specific Plan on October 6, 2021. It shall be noted this evaluation was requested by the City of Malibu to identify operations at intersections and roadways in the event that the school would operate with 1,200 students, this analysis was not prepared as part of the environmental review under the California Environmental Quality Act (CEQA) and the improvements identified are solely meant to reduce traffic congestion rather than mitigation measures to reduce a potential significant environmental impact.

Santa Monica–Malibu Unified School District is redeveloping the former Juan Cabrillo Elementary School (JCES) and MMHS sites to create an updated, modern middle- and high-school campus that provides separate education spaces for the middle- and high-school students, improves vehicle and pedestrian circulation, and secures campus access. The Project is located at 30215 Morning View Drive in Malibu, CA.

The proposed Project would reorganize the campus into three defined areas: Middle School Core, High School Core, and shared amenities. The Project would result in the demolition of 18 existing buildings, with only the existing athletic fields, and the recently completed Buildings A/B and E remaining. The campus modernization project is intended to provide more flexible classroom spaces as MMHS transitions into more project-based learning.

The transportation impact study evaluated traffic conditions in the study area with a student in-person enrollment of 1,000 students. As discussed in the transportation impact study for the MMHS, consistent with the City's population decrease, enrollment at the campus has been steadily decreasing since 2006. Enrollment is not projected to increase, as lower (feeder) grades have been tracking below historic levels, indicating a decrease in future enrollment at middle and high school grades may occur. The Project would not result in an increase in student enrollment or capacity. The redevelopment proposed by the Project

could potentially serve a student population of up to 1,200 students. Therefore the City of Malibu requested an evaluation of potential impacts associated with a maximum enrollment of 1,200 students.

STUDY INTERSECTIONS AND ROADWAYS

The five study intersections provide local access to the school campus and define the extent of the boundaries for this transportation impact analysis. The following five study intersections were selected:

1. Pacific Coast Highway (PCH) and Morning View Drive
2. Merritt Drive and Morning View Drive
3. Morning View Drive and Ebbtide Way/proposed school access
4. Pacific Coast Highway and Guernsey Avenue
5. Clover Heights Avenue and Harvester Road

Roadway segments were also analyzed at the following locations:

1. Morning View Drive east of PCH
2. Morning View Drive east of Merritt Drive
3. Morning View Drive west of Ebbtide Way
4. Morning View Drive west of MMHS near Via Cabrillo
5. Merritt Drive south of Morning View Drive
6. Clover Heights Avenue south of Harvester Road
7. PCH south of Morning View Drive

LEVEL OF SERVICE STANDARDS CONSIDERATIONS

Level of Service (LOS) is no longer used as a threshold from which to determine significant transportation impacts under CEQA, but it is still used by the City of Malibu in the City's Traffic Impact Analysis Guidelines (City of Malibu, December 2019) to describe the operating conditions experienced by motorists and is often used to determine whether circulation improvements are necessary as a condition of approval for a proposed project.

According to the City's Traffic Memorandum and Traffic Impact Analysis Guidelines, Level of Service D is generally considered the design capacity of an arterial intersection. The approving agency may require on- or off-site improvements as a condition of approval if the proposed project would result in volume-to-capacity ratio increases or queuing increases as shown below:

i. Degrades operations at a signalized intersection as follows:

Study Intersections		
Pre-Project		
LOS	V/C	Increase in V/C
C	0.71-0.80	0.04 or more
D	0.81-0.90	0.02 or more
E/F	0.91 or more	0.01 or more

ii. Degrades the LOS at an unsignalized intersection to an unacceptable level of LOS D or worse;

iii. Increases delay by five or more seconds at an unsignalized intersection operating at a LOS A, B, C, D, or E/F;

iv. Project causes or exacerbates 95th percentile turning movement queues exceeding available turn pocket capacity;

v. Results in satisfying the most recent California Manual on Uniform Traffic Control Devices (CAMUTCD) peak-hour volume warrant or other warrants for traffic signal installation at the intersection; or

vi. Increases the v/c ratio on a roadway segment operating at an unacceptable level (LOS D, E, or F) by 0.05 or more.

METHODOLOGY AND OPERATIONAL ANALYSES

Traffic conditions were evaluated in 2024 (Phase 1 Buildout) and 2031 (Project Completion – Campus Buildout). Intersection and roadway segment operations were compared for a 1,200 student enrollment scenario and for a 1,000 student enrollment scenario.

Trip Generation and Distribution

To evaluate traffic conditions for the MMHS operating at a capacity of 1,200 students, traffic would increase by 200 additional students compared to the anticipated enrollment of 1,000 stduents. Trip generation for additional 200 students was estimated for the following three time periods:

- Weekday daily
- Weekday AM peak hour
- School Dismissal peak hour

Trips were estimated using data provided by the Institute of Transportation Engineers (ITE) Trip Generation Manual 11th Edition and shown in Table 1. As additional enrollment would be a mix of middle and high school grades, trip generation was estimated using the higher rates for Middle/Junior School (ITE land use code 522). As shown in 1, additional 200 students would generate weekday daily vehicle trips, 134 weekday AM peak hour vehicle trips, and 72 weekday school dismissal peak hour vehicle trips.

Project trip distribution was based on a review of the circulation network, the school's attendance boundaries and the location and quantities of residential areas. The project trip distribution percentages are shown in Appendix D.

Table 1: Trip Generation Estimate

Trip Generation Rates								
Land Use	Rate	Daily	AM Peak Hour			School Dismissal Peak Hour		
			In	Out	Total	In	Out	Total
Middle/Junior High (ITE code 522)	Students	2.10	54%	46%	0.67	46%	54%	0.36
High School (ITE code 525)	Students	1.94	68%	32%	0.51	32%	68%	0.32
Trip Generation Estimates								
Land Use	Size	Daily	AM Peak Hour			School Dismissal Peak Hour		
			In	Out	Total	In	Out	Total
School Enrollment – 200 students		420	72	62	134	33	39	72

Source: Kittelson & Associates, Inc., 2021; Institute of Transportation Engineers, Trip Generation Manual 11th Edition.
Notes. Trips for 200 students based on middle school trips

INTERSECTION ANALYSIS

INTERSECTION DELAY AND LOS

Tables 2 and 3 present the delays and LOS for the study intersections for the current enrollment and an enrollment at school capacity with 1200 students under 2024 and 2031, respectively. The tables also compare the change in delay between the two scenarios.

Table 2- 2024 Intersection Level of Service Comparison

#	Intersection	Control	Peak Hour	1000-Student Enrollment		1,200-Student Enrollment		Delay or V/C Increases
				Delay in s/veh or (V/C)	LOS	Delay in s/veh or (V/C)	LOS	
1	Morning View Drive and PCH	Signal	AM	**55.2 (0.80)**	**E**	**81.0 (0.82)**	**F**	**0.02**
			PM	44.1 (1.08)	D	51.3 (1.20)	D	**0.12**
2	Morning View Drive and Merritt Drive	SSSC	AM	30.6	D	**38.7**	**E**	**8.1**
			PM	**42.6**	**E**	**51.3**	**F**	**8.7**
3	Morning View Drive and Ebbtide Way	None	AM	11.6	B	12.2	B	0.6
			PM	12.1	B	12.7	B	0.6
4	Guernsey Avenue and PCH	SSSC	AM	**91.9**	**F**	**103.7**	**F**	**11.8**
			PM	**452.2**	**F**	**470.1**	**F**	**17.9**
5	Clover Heights Avenue and Harvester Road	SSSC	AM	8.5	A	8.5	A	0.0
			PM	8.8	A	8.8	A	0.0

Source: Kittelson & Associates, Inc. 2021

Notes:
Bold signifies LOS E or F operations.
Shading indicates negative impact to traffic operations.

Table 3- 2031 Intersection Level of Service Comparison

#	Intersection	Control	Peak Hour	1000-Student Enrollment		1,200-Student Enrollment		Delay or V/C Increases
				Delay in s/veh or (V/C)	LOS	Delay in s/veh or (V/C)	LOS	
1	Morning View Drive and PCH	Signal	AM	**62.7 (0.82)**	**E**	**89.5 (0.84)**	**F**	**0.02**
			PM	51.7 (1.10)	D	**59.6 (1.24)**	**E**	**0.14**
2	Morning View Drive and Merritt Drive	SSSC	AM	33.3	D	**43.0**	**E**	**9.7**
			PM	**49.6**	**E**	**59.5**	**F**	**9.9**
3	Morning View Drive and Ebbtide Way	None	AM	11.8	B	12.4	B	0.6
			PM	12.3	B	12.9	B	0.6
4	Guernsey Avenue and PCH	SSSC	AM	**120.9**	**F**	**141.5**	**F**	**20.6**
			PM	**572.1**	**F**	**593.9**	**F**	**21.8**
5	Clover Heights Avenue and Harvester Road	SSSC	AM	8.5	A	8.5	A	0.0
			PM	8.8	A	8.8	A	0.0

Source: Kittelson & Associates, Inc. 2021

Notes:
Bold signifies LOS E or F operations.
Shading indicates negative impact to traffic operations.

As shown in the table, study intersections 1 (Morning View Drive @ PCH), 2 (Morning View Drive @ Meritt Drive) and 4 (Guernsey Avenue @ PCH) would operate at unacceptable LOS and trips from 200 students would exceed the City's criteria I, ii, and iii listed previously.

INTERSECTION TURN LANE STORAGE QUEUES

The 95th percentile queues at the study intersections were reviewed to identify locations where these may exceed the available storage. Tables 4 and 5 details the movements which were found to queue beyond their available storage capacity at the 95th percentile demand level under 2024 and 2031 conditions, respectively. As shown in Tables 3 and 4, trips associated with 200 additional students would cause an exceedance in the left turn pockets for the northbound and southbound approaches at the intersection of Morning View Drive at PCH. This would be considered a substantial increase per the City's criterion iv described previously (*Project causes or exacerbates 95th percentile turning movement queues exceeding available turn pocket capacity;)*.

Table 2 2024 Queues Comparison

#	Intersection	Movement		Storage (ft)	AM Queue (ft)		PM Queue (ft)	
					1,000-Student Enrollment	1,200-Student Enrollment	1,000-Student Enrollment	1,200-Student Enrollment
1	Morning View Drive and PCH	NB	Right	130	17	12	47	**202**
		SB	Left	115	**120**	**119**	80	**152**
4	Guernsey Avenue and PCH	SB	Left	100	18	18	10	13

Source: Kittelson & Associates, Inc. 2021

Notes:
Bold signifies queues exceeding available storage capacity.
Shading indicates negative impact to traffic operations per criterion iv.

Table 3 2031 Queues Comparison

#	Intersection	Movement		Storage (ft)	AM Queue (ft)		PM Queue (ft)	
					1,000-Student Enrollment	1,200-Student Enrollment	1,000-Student Enrollment	1,200-Student Enrollment
1	Morning View Drive and PCH	NB	Right	130	17	11	52	**246**
		SB	Left	115	**126**	**124**	83	**163**
4	Guernsey Avenue and PCH	SB	Left	100	18	18	13	13

Source: Kittelson & Associates, Inc. 2021

Notes:
Bold signifies queues exceeding available storage capacity.
Shading indicates negative impact to traffic operations per criterion iv.

ROADWAY SEGMENT ANALYSIS

The roadway segment volumes for 2024 and 2031 conditions with an enrollment of 1,200 students are summarized in Table 4 and 6. The capacity for a two-lane stop-controlled urban street is 7,400 for a minor arterial and 10,900 for an urban principal arterial, according to NCHRP Report 825: Planning and Preliminary Engineering Applications Guide to the Highway Capacity Manual. Given the low traffic volumes in the study area, all roadways in the vicinity of the school operate at acceptable LOS A.

Table 4: Roadway Segment Operations, 2024 Conditions with 1,200 students

Roadway	Segment	Lanes	2024 ADT	V/C	LOS
Morning View Drive	east of Merritt Drive	2U	5,480	0.74	C
Morning View Drive	west of campus	2U	1,529	0.21	A
Clover Heights Avenue	south of Harvester Road	2U	195	0.04	A
Harvester Road	east of Clover Heights	2U	1,508	0.31	A
Merritt Drive	south of Morning View Drive	2U	825	0.17	A

Notes:
U = undivided roadway, D = divided roadway

Table 6: Roadway Segment Operations, 2031 Conditions with 1,200 students

Roadway	Segment	Lanes	2031 ADT	V/C	LOS
Morning View Drive	east of Merritt Drive	2U	5,661	0.77	C
Morning View Drive	west of campus	2U	1,583	0.21	A
Clover Heights Avenue	south of Harvester Road	2U	202	0.04	A
Harvester Road	east of Clover Heights	2U	1,562	0.33	A
Merritt Drive	south of Morning View Drive	2U	854	0.18	A

Notes:
U = undivided roadway, D = divided roadway

IMPROVEMENTS

Based on the intersection operations and the adverse traffic flow operations that may occur with 200 additional students, the following traffic flow improvements are identified:

- 1. Morning View Drive at PCH: The signal is under Caltrans' jurisdiction. To improve the delays and LOS, the intersection signal phase could be modified to provide a northbound right turn overlap. No widening would be needed, new hardware would need to be installed. The signal phase modification would allow vehicles to make a right turn and a westbound left turn simultaneously, improving the overall delays to LOS B (18.7 sec/veh) in the AM peak hour and LOS D (39.6 sec/veh) in the student dismissal peak hour. It would also offset the queue increases with a queue of 147 feet in the northbound right pocket, and 126 in the southbound left turn pocket.
  However, both northbound right and southbound left queues will exceed the avaialble storage, and the PM queues would be worse compared to the 1,000 student enrollment condition. Based on aerial photography it appears there is sufficient right of way to modify this intersection. However, all lanes would have to be shifted to the west and likely utilities would have to be moved, and a parking spaces on the west side along the beach eliminated.

- 2. Morning View Drive at Merrit Drive: This intersection operates with the northbound and southbound traffic under free-flow conditions. This intersection experiences unacceptable delays at the approach to Merrit Drive. With signalization, the intersection would operate at acceptable LOS. While a signal would improve operations during the school arrival and dismissal, due to the low traffic volumes it is not expected that a traffic signal would be warranted for most of the day.

- 3. Guernsey at PCH: This intersection operates with the northbound and southbound traffic under free-flow conditions, the unacceptable delays occur at the westbound approach from the residential areas to PCH only. With signalization, the intersection would operate at acceptable LOS. It appears there is sufficient right of way to install a traffic signal. The intersection is under Caltrans' jurisdiction and would conduct an intersection control evaluation to determine it a traffic signal at this location to serve traffic during all times of the day, not only school arrival/dismissal times is warranted.

PROJECT FAIR SHARE

At intersections where an operational deficiency was identified, this traffic impact analysis identified the number of project trips that would affect the intersection and the ratio of project traffic to the projected traffic increase at that location. In other words, the project fair share percentage equals the project traffic divided by the difference of future traffic and existing traffic at all approaches entering the intersection:

$$\textit{Project Fair Share \%} = \frac{Project\ Traffic}{(Future\ Traffic\ Volume - Existing\ Traffic\ Volume)}$$

Fair share contributions are noted as an acceptable mitigation when the project applicant is responsible for only a portion of a costly transportation enhancement. In other words, it is applicable when there are other proposed development projects nearby that may also contribute toward the cost or when the city has other funding sources for the improvement. Table 7 and Table 8 present a summary of Project fair share percentages for intersections where AM or PM peak hour is the period that the deficiencies have been

identified. In 2024, the fair share percentage for each affected intersection ranges from 32 to 90 percent. In 2031 conditions, the fair share percentage for each impacted intersection ranges from 12 to 72 percent.

Table 7 2024 Fair Share Calculations

#	Intersection	Period	Existing Volumes	200-Student Traffic	2024 volumes With Project	New Traffic	Fair Share %
1	Morning View Drive and PCH	PM	2,626	65	2730	104	62%
2	Morning View Drive and Merritt Drive	AM	987	127	1129	142	90%
		PM	1,063	68	1146	84	82%
4	Guernsey Avenue and PCH	AM	1,494	27	1543	49	54%
		PM	**1,883**	**14**	**1925**	**42**	**32%**

Source: Kittelson & Associates, Inc. 2021

Table 8 2031 Fair Share Calculations

#	Intersection	Period	Existing Volumes	200-Student Traffic	2031 Volumes With Project	New Traffic	Fair Share %
1	Morning View Drive and PCH	PM	2,626	65	2825	199	33%
2	Morning View Drive and Merritt Drive	AM	987	127	1165	178	72%
		PM	1,063	68	1185	122	56%
4	Guernsey Avenue and PCH	AM	1,494	27	1597	103	26%
		PM	**1,883**	**14**	**1993**	**110**	**12%**

Source: Kittelson & Associates, Inc. 2021

VEHICLE MILES TRAVELLED (VMT) ASSESSMENT

The total daily VMT for the school can be calculated based on the sum of VMT for all users including students, staff, and others (visitors, vendors, maintenance, etc.). The total VMT from the school has been calculated based on the number of daily trips from staff, students and others multiplied by the average trip distance for each category. The number of trips from students, staff and others are derived from the ITE trip generation. The average trip length for students was calculated based on the school attendance boundary, and the average trip length for staff and others are based on average trip length data in the Southern California Association of Governments (SCAG) travel demand model. Student VMT was calculated using ITE trip generation rates and data from the SCAG model. The total trip generation for a school with an enrollment of 1,000 students is 10,280 miles. The total trip generation for the school for an enrollment of 1,200 students is 12,336 miles.

The City of Malibu and SMMUSD have not adopted VMT methodologies and thresholds to evaluate projects. Thus, for the purpose of this analysis, the guidelines recommended by OPR are used to analyze potential VMT impacts. OPR recommends different approaches in its Technical Advisory depending on the type of land use. OPR has provided recommended metrics and thresholds for residential, office, and retail projects on the assumption that they have the greatest influence of land use projects on VMT in California. For residential and office projects, OPR recommends the use of an efficiency metric (VMT/capita or VMT/employee). For retail, the recommendation is to measure the total VMT. OPR's Technical Advisory

does not provide explicit guidelines for public schools. As local agencies adopt their own VMT methodologies and thresholds, some have included guidance on public schools. For example, the City of Los Angeles and the City of Oakland treat schools as an office use for screening. Some agencies, such as the City of Carlsbad, allow public schools to be screened out. The City of San Jose and the City of Menlo Park use total change in VMT.

Public schools normally have an effect of reducing overall VMT, as students normally would have to travel further if a local school was not present. Because the campus contains the only public middle and high schools in Malibu, it is considered a local serving school that has the effect of reducing overall VMT. Therefore, no transportation impacts related to VMT would occur with the maximum enrollment 1,200 students at the MMHS.

Attachments

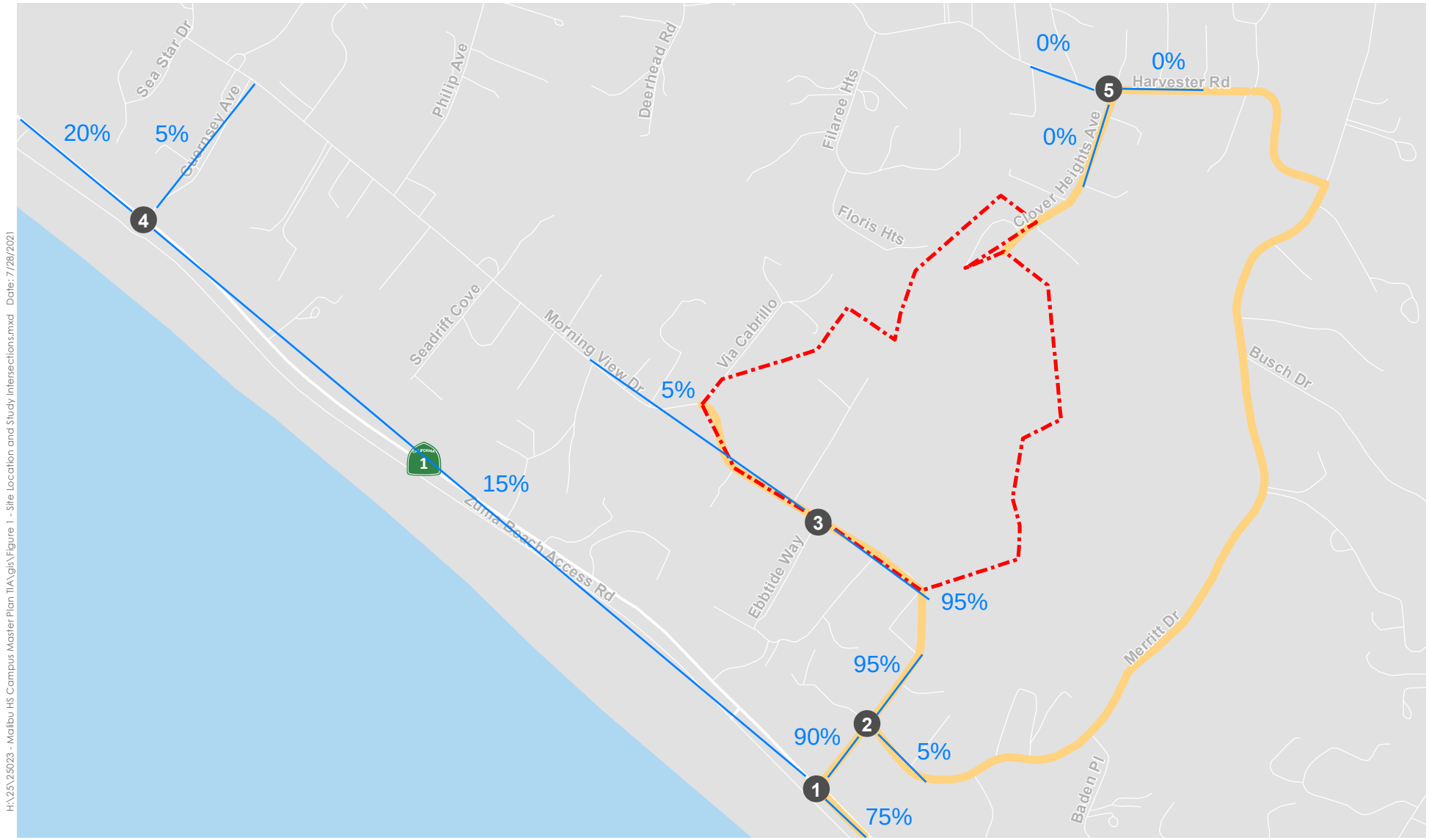
Appendix A – Project Trip Distribution

Appendix B – Existing Operations

Appendix C – 2024 Operations

Appendix D – 2031 Operations

Appendix A – Project Trip Distribution



H:\25\25023 - Malibu HS Campus Master Plan TIA\gis\Figure 1 - Site Location and Study Intersections.mxd Date: 7/28/2021

Appendix A

Trip Distribution

Malibu, CA

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Appendix B – Existing Operations

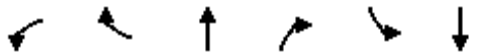
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	349	59	573	616	107	625
Future Volume (veh/h)	349	59	573	616	107	625
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	2059	2059	1796	1796	1796	1796
Adj Flow Rate, veh/h	465	79	764	821	143	833
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	537	478	1325	591	178	1896
Arrive On Green	0.27	0.27	0.39	0.39	0.10	0.56
Sat Flow, veh/h	1961	1745	3501	1522	1710	3501
Grp Volume(v), veh/h	465	79	764	821	143	833
Grp Sat Flow(s),veh/h/ln	1961	1745	1706	1522	1710	1706
Q Serve(g_s), s	15.0	2.3	11.7	25.8	5.4	9.5
Cycle Q Clear(g_c), s	15.0	2.3	11.7	25.8	5.4	9.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	537	478	1325	591	178	1896
V/C Ratio(X)	0.87	0.17	0.58	1.39	0.80	0.44
Avail Cap(c_a), veh/h	735	654	1325	591	227	1993
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.9	18.3	16.0	20.3	29.1	8.7
Incr Delay (d2), s/veh	8.0	0.2	1.8	185.3	11.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	0.9	4.0	37.7	2.6	2.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	31.0	18.5	17.8	205.6	40.8	9.4
LnGrp LOS	C	B	B	F	D	A
Approach Vol, veh/h	544		1585			976
Approach Delay, s/veh	29.2		115.1			14.0
Approach LOS	C		F			B

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	11.1	32.0		23.3		43.1
Change Period (Y+Rc), s	* 4.2	6.2		5.1		6.2
Max Green Setting (Gmax), s	* 8.8	25.8		24.9		38.8
Max Q Clear Time (g_c+I1), s	7.4	27.8		17.0		11.5
Green Ext Time (p_c), s	0.0	0.0		1.2		15.4

Intersection Summary	
HCM 6th Ctrl Delay	68.3
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	465	79	764	821	143	833
v/c Ratio	0.91	0.15	0.71	0.81	0.81	0.52
Control Delay	49.2	5.6	25.4	9.6	67.3	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.2	5.6	25.4	9.6	67.3	13.1
Queue Length 50th (ft)	201	0	160	0	66	126
Queue Length 95th (ft)	#250	18	173	12	#117	134
Internal Link Dist (ft)	64		507			721
Turn Bay Length (ft)	370	370		130	115	
Base Capacity (vph)	538	534	1078	1014	183	1621
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.15	0.71	0.81	0.78	0.51

Intersection Summary

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

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	7	683	13	11	370	0	16	0	14	0	0	1
Future Vol, veh/h	7	683	13	11	370	0	16	0	14	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	911	17	15	493	0	21	0	19	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	493	0	0	928	0	0	1462	1461	920	1470	1469	493
Stage 1	-	-	-	-	-	-	938	938	-	523	523	-
Stage 2	-	-	-	-	-	-	524	523	-	947	946	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1071	-	-	737	-	-	107	129	328	105	127	576
Stage 1	-	-	-	-	-	-	317	343	-	537	530	-
Stage 2	-	-	-	-	-	-	537	530	-	314	340	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1071	-	-	737	-	-	103	123	328	96	121	576
Mov Cap-2 Maneuver	-	-	-	-	-	-	103	123	-	96	121	-
Stage 1	-	-	-	-	-	-	312	337	-	528	515	-
Stage 2	-	-	-	-	-	-	521	515	-	291	334	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	37.2	11.3
HCM LOS			E	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	151	1071	-	-	737	-	-	576
HCM Lane V/C Ratio	0.265	0.009	-	-	0.02	-	-	0.002
HCM Control Delay (s)	37.2	8.4	0	-	10	0	-	11.3
HCM Lane LOS	E	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1	0	-	-	0.1	-	-	0

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	187	0	3	365	4	4
Future Vol, veh/h	187	0	3	365	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	249	0	4	487	5	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	249	0	744	249
Stage 1	-	-	-	-	249	-
Stage 2	-	-	-	-	495	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1317	-	382	790
Stage 1	-	-	-	-	792	-
Stage 2	-	-	-	-	613	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1317	-	380	790
Mov Cap-2 Maneuver	-	-	-	-	380	-
Stage 1	-	-	-	-	792	-
Stage 2	-	-	-	-	611	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	12.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	513	-	-	1317	-
HCM Lane V/C Ratio	0.021	-	-	0.003	-
HCM Control Delay (s)	12.2	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	9.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	48	91	553	52	112	665
Future Vol, veh/h	48	91	553	52	112	665
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	64	121	737	69	149	887

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1514	403	0	0	806	0
Stage 1	772	-	-	-	-	-
Stage 2	742	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	110	597	-	-	814	-
Stage 1	416	-	-	-	-	-
Stage 2	432	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	90	597	-	-	814	-
Mov Cap-2 Maneuver	90	-	-	-	-	-
Stage 1	416	-	-	-	-	-
Stage 2	353	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	90.7	0	1.5
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	203	814	-
HCM Lane V/C Ratio	-	-	0.913	0.183	-
HCM Control Delay (s)	-	-	90.7	10.4	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	7.3	0.7	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	19	2	8	19	1	11
Future Vol, veh/h	19	2	8	19	1	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	25	3	11	25	1	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	28	0	74	27
Stage 1	-	-	-	-	27	-
Stage 2	-	-	-	-	47	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1585	-	930	1048
Stage 1	-	-	-	-	996	-
Stage 2	-	-	-	-	975	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1585	-	923	1048
Mov Cap-2 Maneuver	-	-	-	-	923	-
Stage 1	-	-	-	-	996	-
Stage 2	-	-	-	-	968	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1036	-	-	1585	-
HCM Lane V/C Ratio	0.015	-	-	0.007	-
HCM Control Delay (s)	8.5	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

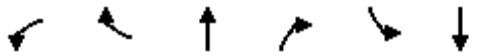
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	581	72	866	355	71	746
Future Volume (veh/h)	581	72	866	355	71	746
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	2059	2059	1796	1796	1796	1796
Adj Flow Rate, veh/h	775	96	1155	473	95	995
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	820	730	1320	589	115	1668
Arrive On Green	0.42	0.42	0.39	0.39	0.07	0.49
Sat Flow, veh/h	1961	1745	3501	1522	1710	3501
Grp Volume(v), veh/h	775	96	1155	473	95	995
Grp Sat Flow(s),veh/h/ln	1961	1745	1706	1522	1710	1706
Q Serve(g_s), s	46.2	4.1	38.1	33.6	6.7	25.6
Cycle Q Clear(g_c), s	46.2	4.1	38.1	33.6	6.7	25.6
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	820	730	1320	589	115	1668
V/C Ratio(X)	0.95	0.13	0.88	0.80	0.82	0.60
Avail Cap(c_a), veh/h	951	846	1331	594	115	1679
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.0	21.8	34.5	33.1	55.9	22.4
Incr Delay (d2), s/veh	16.2	0.1	8.3	11.1	34.3	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	25.2	1.7	16.3	13.4	3.9	9.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	50.2	21.9	42.9	44.2	90.2	24.0
LnGrp LOS	D	C	D	D	F	C
Approach Vol, veh/h	871		1628			1090
Approach Delay, s/veh	47.1		43.3			29.8
Approach LOS	D		D			C

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	12.4	53.2		55.9		65.6
Change Period (Y+Rc), s	* 4.2	6.2		5.1		6.2
Max Green Setting (Gmax), s	* 8.2	47.4		58.9		59.8
Max Q Clear Time (g_c+I1), s	8.7	40.1		48.2		27.6
Green Ext Time (p_c), s	0.0	6.9		2.6		20.4

Intersection Summary	
HCM 6th Ctrl Delay	40.1
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	775	96	1155	473	95	995
v/c Ratio	1.08	0.14	1.03	0.75	0.99	0.71
Control Delay	91.2	7.9	76.3	27.8	149.4	31.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.2	7.9	76.3	27.8	149.4	31.5
Queue Length 50th (ft)	~727	12	~548	200	81	345
Queue Length 95th (ft)	#705	32	471	225	#150	323
Internal Link Dist (ft)	64		516			868
Turn Bay Length (ft)	370	370		130	115	
Base Capacity (vph)	719	681	1118	633	96	1410
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.14	1.03	0.75	0.99	0.71

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	470	16	24	571	0	26	0	14	0	0	0
Future Vol, veh/h	10	470	16	24	571	0	26	0	14	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	627	21	32	761	0	35	0	19	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	761	0	0	648	0	0	1489	1489	638	1498	1499	761
Stage 1	-	-	-	-	-	-	664	664	-	825	825	-
Stage 2	-	-	-	-	-	-	825	825	-	673	674	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	851	-	-	938	-	-	102	124	477	101	122	405
Stage 1	-	-	-	-	-	-	450	458	-	367	387	-
Stage 2	-	-	-	-	-	-	367	387	-	445	454	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	851	-	-	938	-	-	96	114	477	91	112	405
Mov Cap-2 Maneuver	-	-	-	-	-	-	96	114	-	91	112	-
Stage 1	-	-	-	-	-	-	439	447	-	358	364	-
Stage 2	-	-	-	-	-	-	345	364	-	417	443	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.4	49.1	0
HCM LOS			E	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	133	851	-	-	938	-	-	-
HCM Lane V/C Ratio	0.401	0.016	-	-	0.034	-	-	-
HCM Control Delay (s)	49.1	9.3	0	-	9	0	-	0
HCM Lane LOS	E	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	1.7	0	-	-	0.1	-	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	380	2	5	310	2	10
Future Vol, veh/h	380	2	5	310	2	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	507	3	7	413	3	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	510	0	936	509
Stage 1	-	-	-	-	509	-
Stage 2	-	-	-	-	427	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1055	-	294	564
Stage 1	-	-	-	-	604	-
Stage 2	-	-	-	-	658	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1055	-	291	564
Mov Cap-2 Maneuver	-	-	-	-	291	-
Stage 1	-	-	-	-	604	-
Stage 2	-	-	-	-	652	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	12.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	488	-	-	1055	-
HCM Lane V/C Ratio	0.033	-	-	0.006	-
HCM Control Delay (s)	12.6	-	-	8.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	51

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	60	162	867	40	56	712
Future Vol, veh/h	60	162	867	40	56	712
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	80	216	1156	53	75	949

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1808	605	0	0	1209	0
Stage 1	1183	-	-	-	-	-
Stage 2	625	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	~ 70	441	-	-	573	-
Stage 1	253	-	-	-	-	-
Stage 2	496	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 61	441	-	-	573	-
Mov Cap-2 Maneuver	~ 61	-	-	-	-	-
Stage 1	253	-	-	-	-	-
Stage 2	431	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 433	0	0.9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	164	573	-
HCM Lane V/C Ratio	-	-	1.805	0.13	-
HCM Control Delay (s)	-	-	$ 433	12.2	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	21.6	0.4	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	39	1	8	27	2	3
Future Vol, veh/h	39	1	8	27	2	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	52	1	11	36	3	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	53	0	111	53
Stage 1	-	-	-	-	53	-
Stage 2	-	-	-	-	58	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1553	-	886	1014
Stage 1	-	-	-	-	970	-
Stage 2	-	-	-	-	965	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1553	-	880	1014
Mov Cap-2 Maneuver	-	-	-	-	880	-
Stage 1	-	-	-	-	970	-
Stage 2	-	-	-	-	958	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	956	-	-	1553	-
HCM Lane V/C Ratio	0.007	-	-	0.007	-
HCM Control Delay (s)	8.8	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Appendix C – 2024 Operations

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	353	60	582	624	108	634
Future Volume (veh/h)	353	60	582	624	108	634
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	2059	2059	1796	1796	1796	1796
Adj Flow Rate, veh/h	471	80	776	832	144	845
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	543	483	1318	588	179	1890
Arrive On Green	0.28	0.28	0.39	0.39	0.10	0.55
Sat Flow, veh/h	1961	1745	3501	1522	1710	3501
Grp Volume(v), veh/h	471	80	776	832	144	845
Grp Sat Flow(s),veh/h/ln	1961	1745	1706	1522	1710	1706
Q Serve(g_s), s	15.3	2.3	12.1	25.8	5.5	9.8
Cycle Q Clear(g_c), s	15.3	2.3	12.1	25.8	5.5	9.8
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	543	483	1318	588	179	1890
V/C Ratio(X)	0.87	0.17	0.59	1.42	0.80	0.45
Avail Cap(c_a), veh/h	731	651	1318	588	225	1982
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.0	18.3	16.3	20.5	29.2	8.8
Incr Delay (d2), s/veh	8.4	0.2	1.9	196.7	12.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.8	0.9	4.2	39.4	2.6	2.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	31.4	18.5	18.2	217.2	41.3	9.6
LnGrp LOS	C	B	B	F	D	A
Approach Vol, veh/h	551		1608			989
Approach Delay, s/veh	29.5		121.2			14.2
Approach LOS	C		F			B
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	11.2	32.0		23.6		43.2
Change Period (Y+Rc), s	* 4.2	6.2		5.1		6.2
Max Green Setting (Gmax), s	* 8.8	25.8		24.9		38.8
Max Q Clear Time (g_c+I1), s	7.5	27.8		17.3		11.8
Green Ext Time (p_c), s	0.0	0.0		1.2		15.5

Intersection Summary	
HCM 6th Ctrl Delay	71.5
HCM 6th LOS	E

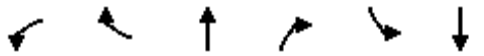
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	353	60	582	624	108	634
Future Volume (vph)	353	60	582	624	108	634
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	8	8	8	8	8	8
Grade (%)	-7%		0%			0%
Total Lost time (s)	5.1	5.1	6.2	6.2	4.2	6.2
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1587	1420	3067	1372	1534	3067
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1587	1420	3067	1372	1534	3067
Peak-hour factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75
Adj. Flow (vph)	471	80	776	832	144	845
RTOR Reduction (vph)	0	54	0	539	0	0
Lane Group Flow (vph)	471	26	776	293	144	845
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2		
Actuated Green, G (s)	23.7	23.7	25.9	25.9	8.5	38.6
Effective Green, g (s)	23.7	23.7	25.9	25.9	8.5	38.6
Actuated g/C Ratio	0.32	0.32	0.35	0.35	0.12	0.52
Clearance Time (s)	5.1	5.1	6.2	6.2	4.2	6.2
Vehicle Extension (s)	3.0	3.0	7.0	7.0	2.0	7.0
Lane Grp Cap (vph)	511	457	1079	482	177	1608
v/s Ratio Prot	c0.30		c0.25		c0.09	0.28
v/s Ratio Perm		0.02		0.21		
v/c Ratio	0.92	0.06	0.72	0.61	0.81	0.53
Uniform Delay, d1	24.1	17.2	20.7	19.7	31.8	11.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	22.2	0.1	3.8	4.5	22.9	1.0
Delay (s)	46.2	17.3	24.5	24.2	54.7	12.5
Level of Service	D	B	C	C	D	B
Approach Delay (s)	42.0		24.3			18.6
Approach LOS	D		C			B

Intersection Summary			
HCM 2000 Control Delay	25.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	73.6	Sum of lost time (s)	15.5
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	471	80	776	832	144	845
v/c Ratio	0.92	0.16	0.72	0.81	0.82	0.53
Control Delay	50.7	5.6	25.8	9.8	68.0	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.7	5.6	25.8	9.8	68.0	13.3
Queue Length 50th (ft)	205	0	164	0	66	128
Queue Length 95th (ft)	#259	18	176	12	#119	136
Internal Link Dist (ft)	170		210			363
Turn Bay Length (ft)				130	115	
Base Capacity (vph)	537	533	1076	1021	183	1618
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.15	0.72	0.81	0.79	0.52

Intersection Summary

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

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	7	692	13	11	375	0	16	0	14	0	0	1
Future Vol, veh/h	7	692	13	11	375	0	16	0	14	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	923	17	15	500	0	21	0	19	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	500	0	0	940	0	0	1481	1480	932	1489	1488	500
Stage 1	-	-	-	-	-	-	950	950	-	530	530	-
Stage 2	-	-	-	-	-	-	531	530	-	959	958	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1064	-	-	729	-	-	103	125	323	102	124	571
Stage 1	-	-	-	-	-	-	312	339	-	533	527	-
Stage 2	-	-	-	-	-	-	532	527	-	309	336	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1064	-	-	729	-	-	99	119	323	93	118	571
Mov Cap-2 Maneuver	-	-	-	-	-	-	99	119	-	93	118	-
Stage 1	-	-	-	-	-	-	306	333	-	523	512	-
Stage 2	-	-	-	-	-	-	516	512	-	286	330	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	38.7	11.3
HCM LOS			E	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	146	1064	-	-	729	-	-	571
HCM Lane V/C Ratio	0.274	0.009	-	-	0.02	-	-	0.002
HCM Control Delay (s)	38.7	8.4	0	-	10	0	-	11.3
HCM Lane LOS	E	A	A	-	B	A	-	B
HCM 95th %tile Q(veh)	1	0	-	-	0.1	-	-	0

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	189	0	3	370	4	4
Future Vol, veh/h	189	0	3	370	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	252	0	4	493	5	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	252	0	753	252
Stage 1	-	-	-	-	252	-
Stage 2	-	-	-	-	501	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1313	-	377	787
Stage 1	-	-	-	-	790	-
Stage 2	-	-	-	-	609	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1313	-	375	787
Mov Cap-2 Maneuver	-	-	-	-	375	-
Stage 1	-	-	-	-	790	-
Stage 2	-	-	-	-	607	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	12.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	508	-	-	1313	-
HCM Lane V/C Ratio	0.021	-	-	0.003	-
HCM Control Delay (s)	12.2	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	10.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	49	92	562	53	113	675
Future Vol, veh/h	49	92	562	53	113	675
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	65	123	749	71	151	900

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1537	410	0	0	820	0
Stage 1	785	-	-	-	-	-
Stage 2	752	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	107	591	-	-	805	-
Stage 1	410	-	-	-	-	-
Stage 2	426	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	87	591	-	-	805	-
Mov Cap-2 Maneuver	87	-	-	-	-	-
Stage 1	410	-	-	-	-	-
Stage 2	346	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	103.7	0	1.5
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	196	805	-
HCM Lane V/C Ratio	-	-	0.959	0.187	-
HCM Control Delay (s)	-	-	103.7	10.5	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	7.9	0.7	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	19	2	8	19	1	11
Future Vol, veh/h	19	2	8	19	1	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	25	3	11	25	1	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	28	0	74	27
Stage 1	-	-	-	-	27	-
Stage 2	-	-	-	-	47	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1585	-	930	1048
Stage 1	-	-	-	-	996	-
Stage 2	-	-	-	-	975	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1585	-	923	1048
Mov Cap-2 Maneuver	-	-	-	-	923	-
Stage 1	-	-	-	-	996	-
Stage 2	-	-	-	-	968	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1036	-	-	1585	-
HCM Lane V/C Ratio	0.015	-	-	0.007	-
HCM Control Delay (s)	8.5	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	590	73	879	360	72	757
Future Volume (veh/h)	590	73	879	360	72	757
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	2059	2059	1796	1796	1796	1796
Adj Flow Rate, veh/h	787	97	1172	480	96	1009
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	831	739	1301	580	102	1630
Arrive On Green	0.42	0.42	0.38	0.38	0.06	0.48
Sat Flow, veh/h	1961	1745	3501	1522	1710	3501
Grp Volume(v), veh/h	787	97	1172	480	96	1009
Grp Sat Flow(s),veh/h/ln	1961	1745	1706	1522	1710	1706
Q Serve(g_s), s	44.2	3.9	37.0	32.6	6.4	25.1
Cycle Q Clear(g_c), s	44.2	3.9	37.0	32.6	6.4	25.1
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	831	739	1301	580	102	1630
V/C Ratio(X)	0.95	0.13	0.90	0.83	0.94	0.62
Avail Cap(c_a), veh/h	925	823	1307	583	102	1635
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.7	20.1	33.3	31.9	53.6	22.1
Incr Delay (d2), s/veh	17.3	0.1	10.2	12.7	70.4	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	24.3	1.6	16.0	13.2	4.6	9.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	49.0	20.2	43.5	44.7	123.9	23.9
LnGrp LOS	D	C	D	D	F	C
Approach Vol, veh/h	884		1652			1105
Approach Delay, s/veh	45.9		43.9			32.6
Approach LOS	D		D			C

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	11.0	49.8		53.5		60.8
Change Period (Y+Rc), s	* 4.2	6.2		5.1		6.2
Max Green Setting (Gmax), s	* 6.8	43.8		53.9		54.8
Max Q Clear Time (g_c+I1), s	8.4	39.0		46.2		27.1
Green Ext Time (p_c), s	0.0	4.6		2.2		18.5

Intersection Summary	
HCM 6th Ctrl Delay	40.9
HCM 6th LOS	D

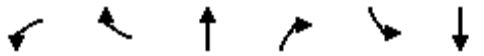
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	590	73	879	360	72	757
Future Volume (vph)	590	73	879	360	72	757
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	8	8	8	8	8	8
Grade (%)	-7%		0%			0%
Total Lost time (s)	5.1	5.1	6.2	6.2	4.2	6.2
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1587	1420	3067	1372	1534	3067
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1587	1420	3067	1372	1534	3067
Peak-hour factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75
Adj. Flow (vph)	787	97	1172	480	96	1009
RTOR Reduction (vph)	0	41	0	145	0	0
Lane Group Flow (vph)	787	56	1172	335	96	1009
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2		
Actuated Green, G (s)	53.9	53.9	43.8	43.8	6.8	54.8
Effective Green, g (s)	53.9	53.9	43.8	43.8	6.8	54.8
Actuated g/C Ratio	0.45	0.45	0.36	0.36	0.06	0.46
Clearance Time (s)	5.1	5.1	6.2	6.2	4.2	6.2
Vehicle Extension (s)	3.0	3.0	7.0	7.0	2.0	7.0
Lane Grp Cap (vph)	712	637	1119	500	86	1400
v/s Ratio Prot	c0.50		c0.38		c0.06	0.33
v/s Ratio Perm		0.04		0.24		
v/c Ratio	1.11	0.09	1.05	0.67	1.12	0.72
Uniform Delay, d1	33.0	19.0	38.1	32.0	56.6	26.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	66.4	0.1	40.2	6.2	132.0	2.9
Delay (s)	99.4	19.0	78.3	38.2	188.6	29.3
Level of Service	F	B	E	D	F	C
Approach Delay (s)	90.6		66.6			43.2
Approach LOS	F		E			D

Intersection Summary			
HCM 2000 Control Delay	65.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	787	97	1172	480	96	1009
v/c Ratio	1.11	0.14	1.05	0.74	1.12	0.72
Control Delay	98.7	7.0	77.6	25.0	183.3	30.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.7	7.0	77.6	25.0	183.3	30.1
Queue Length 50th (ft)	~694	10	~519	175	~85	325
Queue Length 95th (ft)	#683	29	446	202	#152	307
Internal Link Dist (ft)	64		210			363
Turn Bay Length (ft)				130	115	
Base Capacity (vph)	712	678	1119	645	86	1400
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.14	1.05	0.74	1.12	0.72

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	10	476	16	24	579	0	26	0	14	0	0	0
Future Vol, veh/h	10	476	16	24	579	0	26	0	14	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	635	21	32	772	0	35	0	19	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	772	0	0	656	0	0	1508	1508	646	1517	1518	772
Stage 1	-	-	-	-	-	-	672	672	-	836	836	-
Stage 2	-	-	-	-	-	-	836	836	-	681	682	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	843	-	-	931	-	-	99	121	472	98	119	400
Stage 1	-	-	-	-	-	-	445	454	-	362	382	-
Stage 2	-	-	-	-	-	-	362	382	-	440	450	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	843	-	-	931	-	-	93	111	472	88	109	400
Mov Cap-2 Maneuver	-	-	-	-	-	-	93	111	-	88	109	-
Stage 1	-	-	-	-	-	-	434	443	-	353	359	-
Stage 2	-	-	-	-	-	-	340	359	-	412	439	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.4	51.3	0
HCM LOS			F	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	129	843	-	-	931	-	-	-
HCM Lane V/C Ratio	0.413	0.016	-	-	0.034	-	-	-
HCM Control Delay (s)	51.3	9.3	0	-	9	0	-	0
HCM Lane LOS	F	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	1.8	0	-	-	0.1	-	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	385	2	5	314	2	10
Future Vol, veh/h	385	2	5	314	2	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	513	3	7	419	3	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	516	0	948	515
Stage 1	-	-	-	-	515	-
Stage 2	-	-	-	-	433	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1050	-	289	560
Stage 1	-	-	-	-	600	-
Stage 2	-	-	-	-	654	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1050	-	286	560
Mov Cap-2 Maneuver	-	-	-	-	286	-
Stage 1	-	-	-	-	600	-
Stage 2	-	-	-	-	648	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	12.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	483	-	-	1050	-
HCM Lane V/C Ratio	0.033	-	-	0.006	-
HCM Control Delay (s)	12.7	-	-	8.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	55.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	61	164	880	41	56	723
Future Vol, veh/h	61	164	880	41	56	723
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	81	219	1173	55	75	964

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1833	614	0	0	1228	0
Stage 1	1201	-	-	-	-	-
Stage 2	632	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	~ 68	435	-	-	563	-
Stage 1	248	-	-	-	-	-
Stage 2	492	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 59	435	-	-	563	-
Mov Cap-2 Maneuver	~ 59	-	-	-	-	-
Stage 1	248	-	-	-	-	-
Stage 2	427	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 470.1	0	0.9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	159	563	-
HCM Lane V/C Ratio	-	-	1.887	0.133	-
HCM Control Delay (s)	-	-	$ 470.1	12.4	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	22.6	0.5	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	40	1	8	27	2	3
Future Vol, veh/h	40	1	8	27	2	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	53	1	11	36	3	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	54	0	112	54
Stage 1	-	-	-	-	54	-
Stage 2	-	-	-	-	58	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1551	-	885	1013
Stage 1	-	-	-	-	969	-
Stage 2	-	-	-	-	965	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1551	-	879	1013
Mov Cap-2 Maneuver	-	-	-	-	879	-
Stage 1	-	-	-	-	969	-
Stage 2	-	-	-	-	958	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	955	-	-	1551	-
HCM Lane V/C Ratio	0.007	-	-	0.007	-
HCM Control Delay (s)	8.8	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Appendix D – 2031 Operations

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	364	62	602	645	112	657
Future Volume (veh/h)	364	62	602	645	112	657
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	2059	2059	1796	1796	1796	1796
Adj Flow Rate, veh/h	485	83	803	860	149	876
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	554	493	1299	579	185	1878
Arrive On Green	0.28	0.28	0.38	0.38	0.11	0.55
Sat Flow, veh/h	1961	1745	3501	1522	1710	3501
Grp Volume(v), veh/h	485	83	803	860	149	876
Grp Sat Flow(s),veh/h/ln	1961	1745	1706	1522	1710	1706
Q Serve(g_s), s	16.0	2.4	12.9	25.8	5.8	10.5
Cycle Q Clear(g_c), s	16.0	2.4	12.9	25.8	5.8	10.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	554	493	1299	579	185	1878
V/C Ratio(X)	0.87	0.17	0.62	1.48	0.81	0.47
Avail Cap(c_a), veh/h	721	641	1299	579	222	1953
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.2	18.3	17.0	21.0	29.5	9.2
Incr Delay (d2), s/veh	9.5	0.2	2.2	227.3	13.9	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	0.9	4.5	43.9	2.8	3.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	32.6	18.5	19.2	248.2	43.4	10.0
LnGrp LOS	C	B	B	F	D	B
Approach Vol, veh/h	568		1663			1025
Approach Delay, s/veh	30.6		137.7			14.9
Approach LOS	C		F			B

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	11.5	32.0		24.3		43.5
Change Period (Y+Rc), s	* 4.2	6.2		5.1		6.2
Max Green Setting (Gmax), s	* 8.8	25.8		24.9		38.8
Max Q Clear Time (g_c+I1), s	7.8	27.8		18.0		12.5
Green Ext Time (p_c), s	0.0	0.0		1.2		15.7

Intersection Summary	
HCM 6th Ctrl Delay	80.3
HCM 6th LOS	F

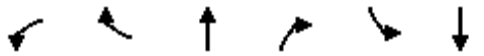
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	364	62	602	645	112	657
Future Volume (vph)	364	62	602	645	112	657
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	8	8	8	8	8	8
Grade (%)	-7%		0%			0%
Total Lost time (s)	5.1	5.1	6.2	6.2	4.2	6.2
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1587	1420	3067	1372	1534	3067
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1587	1420	3067	1372	1534	3067
Peak-hour factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75
Adj. Flow (vph)	485	83	803	860	149	876
RTOR Reduction (vph)	0	56	0	561	0	0
Lane Group Flow (vph)	485	27	803	299	149	876
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2		
Actuated Green, G (s)	24.2	24.2	25.8	25.8	8.6	38.6
Effective Green, g (s)	24.2	24.2	25.8	25.8	8.6	38.6
Actuated g/C Ratio	0.33	0.33	0.35	0.35	0.12	0.52
Clearance Time (s)	5.1	5.1	6.2	6.2	4.2	6.2
Vehicle Extension (s)	3.0	3.0	7.0	7.0	2.0	7.0
Lane Grp Cap (vph)	518	463	1067	477	178	1597
v/s Ratio Prot	c0.31		c0.26		c0.10	0.29
v/s Ratio Perm		0.02		0.22		
v/c Ratio	0.94	0.06	0.75	0.63	0.84	0.55
Uniform Delay, d1	24.2	17.1	21.3	20.1	32.1	11.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	24.5	0.1	4.4	5.1	26.5	1.1
Delay (s)	48.7	17.2	25.7	25.2	58.6	13.0
Level of Service	D	B	C	C	E	B
Approach Delay (s)	44.1		25.5			19.6
Approach LOS	D		C			B

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	74.1	Sum of lost time (s)	15.5
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	485	83	803	860	149	876
v/c Ratio	0.94	0.16	0.75	0.83	0.84	0.55
Control Delay	53.6	5.5	26.9	10.3	71.7	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.6	5.5	26.9	10.3	71.7	13.7
Queue Length 50th (ft)	214	0	172	0	69	135
Queue Length 95th (ft)	#285	18	184	11	#124	142
Internal Link Dist (ft)	64		210			363
Turn Bay Length (ft)				130	115	
Base Capacity (vph)	533	532	1068	1038	181	1606
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.16	0.75	0.83	0.82	0.55

Intersection Summary

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

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	7	714	14	12	386	0	17	0	14	0	0	1
Future Vol, veh/h	7	714	14	12	386	0	17	0	14	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	952	19	16	515	0	23	0	19	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	515	0	0	971	0	0	1528	1527	962	1536	1536	515
Stage 1	-	-	-	-	-	-	980	980	-	547	547	-
Stage 2	-	-	-	-	-	-	548	547	-	989	989	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1051	-	-	710	-	-	96	117	310	95	116	560
Stage 1	-	-	-	-	-	-	301	328	-	521	517	-
Stage 2	-	-	-	-	-	-	521	517	-	297	325	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1051	-	-	710	-	-	92	111	310	86	110	560
Mov Cap-2 Maneuver	-	-	-	-	-	-	92	111	-	86	110	-
Stage 1	-	-	-	-	-	-	295	322	-	511	500	-
Stage 2	-	-	-	-	-	-	503	500	-	274	319	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	43	11.4
HCM LOS			E	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	135	1051	-	-	710	-	-	560
HCM Lane V/C Ratio	0.306	0.009	-	-	0.023	-	-	0.002
HCM Control Delay (s)	43	8.5	0	-	10.2	0	-	11.4
HCM Lane LOS	E	A	A	-	B	A	-	B
HCM 95th %tile Q(veh)	1.2	0	-	-	0.1	-	-	0

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	195	0	3	382	4	4
Future Vol, veh/h	195	0	3	382	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	260	0	4	509	5	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	260	0	777	260
Stage 1	-	-	-	-	260	-
Stage 2	-	-	-	-	517	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1304	-	365	779
Stage 1	-	-	-	-	783	-
Stage 2	-	-	-	-	598	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1304	-	364	779
Mov Cap-2 Maneuver	-	-	-	-	364	-
Stage 1	-	-	-	-	783	-
Stage 2	-	-	-	-	596	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	12.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	496	-	-	1304	-
HCM Lane V/C Ratio	0.022	-	-	0.003	-
HCM Control Delay (s)	12.4	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	13.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	50	96	581	55	117	698
Future Vol, veh/h	50	96	581	55	117	698
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	67	128	775	73	156	931

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1590	424	0	0	848	0
Stage 1	812	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	98	579	-	-	785	-
Stage 1	397	-	-	-	-	-
Stage 2	413	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	78	579	-	-	785	-
Mov Cap-2 Maneuver	78	-	-	-	-	-
Stage 1	397	-	-	-	-	-
Stage 2	331	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	141.5	0	1.5
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	181	785	-
HCM Lane V/C Ratio	-	-	1.076	0.199	-
HCM Control Delay (s)	-	-	141.5	10.7	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	9.4	0.7	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	20	2	8	20	1	12
Future Vol, veh/h	20	2	8	20	1	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	3	11	27	1	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	30	0	78	29
Stage 1	-	-	-	-	29	-
Stage 2	-	-	-	-	49	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1583	-	925	1046
Stage 1	-	-	-	-	994	-
Stage 2	-	-	-	-	973	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1583	-	919	1046
Mov Cap-2 Maneuver	-	-	-	-	919	-
Stage 1	-	-	-	-	994	-
Stage 2	-	-	-	-	966	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1035	-	-	1583	-
HCM Lane V/C Ratio	0.017	-	-	0.007	-
HCM Control Delay (s)	8.5	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	609	75	910	372	74	784
Future Volume (veh/h)	609	75	910	372	74	784
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	2059	2059	1796	1796	1796	1796
Adj Flow Rate, veh/h	812	100	1213	496	99	1045
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	850	756	1299	579	106	1625
Arrive On Green	0.43	0.43	0.38	0.38	0.06	0.48
Sat Flow, veh/h	1961	1745	3501	1522	1710	3501
Grp Volume(v), veh/h	812	100	1213	496	99	1045
Grp Sat Flow(s),veh/h/ln	1961	1745	1706	1522	1710	1706
Q Serve(g_s), s	50.2	4.3	42.8	37.5	7.2	29.0
Cycle Q Clear(g_c), s	50.2	4.3	42.8	37.5	7.2	29.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	850	756	1299	579	106	1625
V/C Ratio(X)	0.96	0.13	0.93	0.86	0.93	0.64
Avail Cap(c_a), veh/h	922	820	1301	580	106	1628
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.3	21.3	37.3	35.7	58.5	24.8
Incr Delay (d2), s/veh	18.9	0.1	13.5	15.0	64.4	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	27.8	1.8	19.2	15.5	4.9	11.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	53.3	21.4	50.8	50.7	122.9	26.7
LnGrp LOS	D	C	D	D	F	C
Approach Vol, veh/h	912		1709			1144
Approach Delay, s/veh	49.8		50.7			35.1
Approach LOS	D		D			D
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	12.0	53.9		59.4		65.9
Change Period (Y+Rc), s	* 4.2	6.2		5.1		6.2
Max Green Setting (Gmax), s	* 7.8	47.8		58.9		59.8
Max Q Clear Time (g_c+I1), s	9.2	44.8		52.2		31.0
Green Ext Time (p_c), s	0.0	2.9		2.1		19.7

Intersection Summary	
HCM 6th Ctrl Delay	45.7
HCM 6th LOS	D

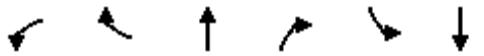
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	609	75	910	372	74	784
Future Volume (vph)	609	75	910	372	74	784
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	8	8	8	8	8	8
Grade (%)	-7%		0%			0%
Total Lost time (s)	5.1	5.1	6.2	6.2	4.2	6.2
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1587	1420	3067	1372	1534	3067
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1587	1420	3067	1372	1534	3067
Peak-hour factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75
Adj. Flow (vph)	812	100	1213	496	99	1045
RTOR Reduction (vph)	0	38	0	133	0	0
Lane Group Flow (vph)	812	62	1213	363	99	1045
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	4		2		1	6
Permitted Phases		4		2		
Actuated Green, G (s)	58.9	58.9	47.8	47.8	7.8	59.8
Effective Green, g (s)	58.9	58.9	47.8	47.8	7.8	59.8
Actuated g/C Ratio	0.45	0.45	0.37	0.37	0.06	0.46
Clearance Time (s)	5.1	5.1	6.2	6.2	4.2	6.2
Vehicle Extension (s)	3.0	3.0	7.0	7.0	2.0	7.0
Lane Grp Cap (vph)	719	643	1127	504	92	1410
v/s Ratio Prot	c0.51		c0.40		c0.06	0.34
v/s Ratio Perm		0.04		0.26		
v/c Ratio	1.13	0.10	1.08	0.72	1.08	0.74
Uniform Delay, d1	35.5	20.3	41.1	35.3	61.1	28.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	75.1	0.1	49.9	7.9	115.9	3.2
Delay (s)	110.7	20.4	91.0	43.2	177.0	31.9
Level of Service	F	C	F	D	F	C
Approach Delay (s)	100.8		77.1			44.5
Approach LOS	F		E			D

Intersection Summary			
HCM 2000 Control Delay	72.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	812	100	1213	496	99	1045
v/c Ratio	1.13	0.15	1.08	0.78	1.08	0.74
Control Delay	109.1	8.3	89.2	30.0	172.2	32.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	109.1	8.3	89.2	30.0	172.2	32.7
Queue Length 50th (ft)	~792	14	~598	223	~93	372
Queue Length 95th (ft)	#761	34	#508	246	#163	345
Internal Link Dist (ft)	64		210			363
Turn Bay Length (ft)				130	115	
Base Capacity (vph)	719	681	1127	637	92	1410
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.15	1.08	0.78	1.08	0.74

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	11	492	17	25	599	0	27	0	14	0	0	0
Future Vol, veh/h	11	492	17	25	599	0	27	0	14	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	656	23	33	799	0	36	0	19	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	799	0	0	679	0	0	1563	1563	668	1572	1574	799
Stage 1	-	-	-	-	-	-	698	698	-	865	865	-
Stage 2	-	-	-	-	-	-	865	865	-	707	709	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	824	-	-	913	-	-	91	112	458	89	110	386
Stage 1	-	-	-	-	-	-	431	442	-	348	371	-
Stage 2	-	-	-	-	-	-	348	371	-	426	437	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	824	-	-	913	-	-	85	102	458	79	100	386
Mov Cap-2 Maneuver	-	-	-	-	-	-	85	102	-	79	100	-
Stage 1	-	-	-	-	-	-	419	429	-	338	347	-
Stage 2	-	-	-	-	-	-	325	347	-	397	424	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.4	59.5	0
HCM LOS			F	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	118	824	-	-	913	-	-	-
HCM Lane V/C Ratio	0.463	0.018	-	-	0.037	-	-	-
HCM Control Delay (s)	59.5	9.4	0	-	9.1	0	-	0
HCM Lane LOS	F	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	2.1	0.1	-	-	0.1	-	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	398	2	5	324	2	11
Future Vol, veh/h	398	2	5	324	2	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	531	3	7	432	3	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	534	0	979	533
Stage 1	-	-	-	-	533	-
Stage 2	-	-	-	-	446	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1034	-	277	547
Stage 1	-	-	-	-	588	-
Stage 2	-	-	-	-	645	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1034	-	275	547
Mov Cap-2 Maneuver	-	-	-	-	275	-
Stage 1	-	-	-	-	588	-
Stage 2	-	-	-	-	639	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	12.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	475	-	-	1034	-
HCM Lane V/C Ratio	0.036	-	-	0.006	-
HCM Control Delay (s)	12.9	-	-	8.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	69.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	63	170	911	42	58	748
Future Vol, veh/h	63	170	911	42	58	748
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	84	227	1215	56	77	997

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1896	636	0	0	1271	0
Stage 1	1243	-	-	-	-	-
Stage 2	653	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	~ 61	421	-	-	542	-
Stage 1	235	-	-	-	-	-
Stage 2	480	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 52	421	-	-	542	-
Mov Cap-2 Maneuver	~ 52	-	-	-	-	-
Stage 1	235	-	-	-	-	-
Stage 2	412	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 593.9	0	0.9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	144	542	-
HCM Lane V/C Ratio	-	-	2.157	0.143	-
HCM Control Delay (s)	-	-	$ 593.9	12.7	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	25.4	0.5	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	41	1	8	28	2	3
Future Vol, veh/h	41	1	8	28	2	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	55	1	11	37	3	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	56	0	115	56
Stage 1	-	-	-	-	56	-
Stage 2	-	-	-	-	59	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1549	-	881	1011
Stage 1	-	-	-	-	967	-
Stage 2	-	-	-	-	964	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1549	-	875	1011
Mov Cap-2 Maneuver	-	-	-	-	875	-
Stage 1	-	-	-	-	967	-
Stage 2	-	-	-	-	957	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	952	-	-	1549	-
HCM Lane V/C Ratio	0.007	-	-	0.007	-
HCM Control Delay (s)	8.8	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-